

## DENTAL PRACTICE CHALLENGES IN EL SALVADOR IN THE FACE OF THE GLOBAL COVID-19 PANDEMIC

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### ABSTRACT

The high contagiousness of the COVID-19 virus, determined by its transmission mechanism through microdroplets that spread in aerosol form when coughing, talking, or sneezing, puts professionals such as dentists on the front line of contagion, especially due to the close working distance between the patient's mouth and the specialist. The general objective of this study was to describe the challenges of dental practice in El Salvador in the face of the global COVID-19 pandemic. The research was conducted using a quantitative, descriptive, prospective, and cross-sectional approach, with a convenience sample of 112 individuals who practice dentistry in El Salvador in public, private, and academic sectors. Virtual surveys were conducted using the Google Forms tool. The resulting data was tabulated and analyzed using the statistical program SPSS 23. All respondents follow national or international biosafety protocols to perform their clinical activities. In terms of treatment costs, the majority increased between 5.00 to 10.00 USD per patient. In the sum of the scales of depression, anxiety, and stress levels, none scored 0 and it stands out that 30% of them reported experiencing stress and anxiety ranging from mild to extremely severe.

**Keywords:** protocol, biosafety, DASS-21, coronavirus, dentistry, El Salvador.

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## DESAFÍOS DE LA PRÁCTICA ODONTOLÓGICA EN EL SALVADOR, ANTE LA PANDEMIA MUNDIAL DEL COVID-19

### Resumen

La alta contagiosidad del virus del COVID-19, determinada por su mecanismo de transmisión, a través de microgotas que se esparcen por aerosoles al toser, hablar o estornudar, ponen a profesionales como el odontólogo en primera línea de contagio, sobre todo por la distancia de trabajo entre la boca del paciente y el operador. El objetivo general de este estudio fue describir los desafíos de la práctica odontológica en El Salvador ante la pandemia mundial del covid-19. La investigación es de tipo cuantitativa, descriptiva, prospectiva y transversal, con una muestra a conveniencia de 112 sujetos que ejercen la odontología en El Salvador, provenientes de los ámbitos públicos, privados y académicos. Se les aplicaron encuestas virtuales con la herramienta Google forms. La información resultante fue tabulada y analizada en el programa estadístico SPSS versión 23. Todos los encuestados utilizan protocolos de bioseguridad para el desarrollo de sus actividades clínicas y estos varían entre protocolos nacionales e internacionales. En cuanto a costos de tratamiento, en su mayoría han tenido incremento de entre 5.00 to 10.00 USD por paciente. El nivel de depresión, ansiedad y estrés, en la sumatoria de la escala ninguno presentó a 0, destacando que el 30 % de ellos presentó estrés y ansiedad de leve a extremadamente severa.

**Palabras clave:** protocolo, bioseguridad, DASS 21, coronavirus, odontología, El Salvador.

### INTRODUCTION

Since the World Health Organization declared the global COVID-19 pandemic, healthcare professionals have faced a significant challenge in the exercise of their professions.

Extensive bibliography indicates that the mode of transmission is through direct contact via droplets, and transmission through aerosols is another possible route (1, 2, 3).

In general, dentists are exposed to multiple pathogens such as viruses and bacteria in the course of their professional practice due to the specific nature of their work in oral treatments, which involves direct face-to-face contact as well as contact with fluids such as saliva, blood, and others (4). Examples of such risks include the hepatitis B virus and the emergence of the HIV virus in the 1980s. Under these conditions and because they are on the front line exposed



to contagion, especially due to the generation of aerosols in the clinic, dentists must make the necessary investments in order to guarantee safe treatments for their patients and to protect themselves as well.

Furthermore, the stress generated by the necessary investments, the increased cost of treatment, and concerns about whether patients will accept these changes, as well as the fear of contagion upon resuming clinical practice, create anxiety-inducing environments that can be transferred to the professionals' surroundings and directly impact their emotional well-being.

The general objective of this study is to describe the challenges of dental practice in El Salvador during the global COVID-19 pandemic

### **Biosafety protocols**

Before the pandemic, dentistry biosafety protocols in El Salvador were based on the "Lineamientos técnicos sobre Bioseguridad" (Biosafety technical guidelines) published by the Ministry of Public Health in February 2012. These guidelines aim to establish general measures of biosafety within different environments of healthcare services of the RIISS (Redes Integrales e Integradas de Servicios de Salud, Comprehensive and Integrated Networks of Health Services) in order to protect the health of workers, families, and the community (5). The guidelines include the application scope, which defines that all establishments within the national health system are obliged to comply with them, they also provide technical provisions, a description of the trans-

mission chain, epidemiology, risk assessment, classification of microorganisms according to transmission risk, transmission risk based on hospital risk, biosafety levels, prevention guidelines, and validity period.

According to the guidelines, the field of dentistry is contemplated as a semi-critical or intermediate-risk area (14, 15). Depending on the level of biosafety, dentistry is classified between level 2 and 3 (14, 15). In all these cases, the use of preventive measures is recommended, such as proper handwashing and during patient care, it is mandatory to use:

1. Disposable gloves
2. Protective goggles and face shield
3. Disposable masks, specifically N95 type for those exposed to aerosol-borne infections
4. Disposable protective cap
5. Disposable long-sleeved, knee-length overcoats
6. Closed, sturdy, waterproof, and slip-resistant footwear that provides complete feet coverage (14, 15)

An important recommendation from the technical guidelines to healthcare personnel is: they should not touch their eyes, nose, or any other exposed mucous membrane or skin, nor should they touch any material or equipment unrelated to the activities they are performing while wearing gloves (14, 15).



The technical guidelines also extensively address asepsis, antisepsis, and antiseptics. For handwashing, they recommend using 4% chlorhexidine gluconate or povidone-iodine (14, 15). For surface cleaning, they recommend using an intermediate-level disinfectant such as 200 ppm sodium hypochlorite or a quaternary ammonium-based soap (14, 15). The guidelines recommend that routine cleaning be done first with a disinfectant such as 70% alcohol for corrosible surfaces, 500 parts per million bleach, or a 1% dilution of a 5% solution for other surfaces (14, 15).

With the emergence of COVID-19, various institutions and associations worldwide proposed multiple protocols for patient care in the so-called "new normal". The World Dental Federation (FDI), in accordance with organizations such as the Centers for Disease Control and Prevention (CDC) and its European counterpart, the ECDC, proposes a protocol that includes all measures regarding the use of personal protective equipment (PPE).

### Required investment for dental practice

The impact of the pandemic worldwide has posed a series of challenges to governments and productive sectors of countries. The sudden halt in economic activity has led to a contraction of the economy, according to the World Bank, causing the largest economic recession since World War II. The outlook couldn't be more complicated, as the same source states that per capita income will push millions of people into poverty.

This contraction has caused economies in countries dependent on remittances to be affected, as remittances have decreased due to mass layoffs. In El Salvador, according to the Central Reserve Bank, the money received between January and May 2020 decreased by 11.6% compared to the same period in 2019 (7). Specifically, El Salvador stopped receiving 235.9 million USD from the United States in these five months, a decrease of 10.9% compared to the 2.164 billion USD recorded in the same period of 2019.

This has led to a change in consumer behavior, driven by variations in consumer perceptions, needs, and expectations (8). In this study, 76% of the surveyed population reveals a decrease in household incomes for Salvadoran households, which will restrict future expenses, affecting consumption patterns and rearranging spending priorities.

In professional sectors, especially in healthcare services, and specifically in the case of private sector dentists, their offer is affected as oral health has not been a priority for the population, since oral diseases are not directly linked to mortality, despite dental caries being the third most prevalent disease worldwide and periodontal diseases affect around 10% of the global population (9).

In addition to this, disinfection protocols require an additional investment in dental clinics, both in the private and public sectors. The increased cost of biosafety supplies due to high demand has led to a pass on the additional costs to patients. According to an interesting study



on Salvadoran consumer behavior conducted by Analitika Marketing, 67% of the surveyed population states that they will be more demanding regarding general hygiene conditions.

By March, national news outlets were reporting the shortage and rising prices of products such as hand sanitizer, surgical masks and gloves. The high demand led to opportunistic behavior by merchants; for example, a box of 50 surgical masks, commonly used in clinics, cost between 3.50 to 5.00 USD before the pandemic, but by March-April, the price of a box escalated to 20.00 to 25.00 USD.

### **Depression, anxiety, and stress (DASS-21)**

On a personal level, facing the pandemic has involved dealing with situations of high emotional demand, as modern societies had never before been subjected to such long periods of confinement, social isolation, or strict hygiene measures.

Mental health is a current topic, as it impacts the quality of decisions as well as interpersonal relationships. The feeling of restlessness, anxiety, confusion, stress, or a mixture of them, in a crisis, is not only normal, but also understandable (10, 11).

According to the CDC, stress during this pandemic can include reactions such as:

1. Fear and concern for one's own health and the health of loved ones, financial or employment situation, or loss of relied-upon support services.
2. Changes in sleep or eating patterns
3. Difficulty sleeping or concentrating
4. Exacerbation of chronic health problems.
5. Exacerbation of mental health problems.
6. Increased use of tobacco and/or alcohol and other substances

Given this unprecedented situation in the world, it is difficult to estimate the psychological and emotional consequences of COVID-19 (12) on the population; therefore, it becomes relevant to study the phenomenon in different sectors in order to develop a parameter for addressing it in different circumstances.

For dentistry professionals, specifically those who rely on private practice, the lockdown measures implied a reduction in their income, which increased concerns about family finances and future investments in dental clinics to ensure that patients receive treatments without the risk of COVID-19 contagion, in addition to dealing like the rest of the population with the separation from family and friends, disruption of daily routines, and a predisposition to health problems associated with poor nutrition or sedentary lifestyles (13).



In a recently conducted study in the country, the DASS-21 scale (which measures three emotional dimensions: depression, anxiety and stress) was used. A non-probabilistic sample of 339 participants over 18 years old was collected, 62% women and 38% men, with the majority being workers (52.8%). The most significant results were that approximately 75% of the sample exhibited mild symptoms of depression, stress, and anxiety, while the remaining participants exhibited symptoms ranging from moderate to extremely severe. The levels of these symptoms—depression, anxiety, and stress—were statistically higher in women under the age of 32.

In the study conducted by Analitika, which had a sample size of 1,034 cases and a confidence level of 95%, it was reported that 64.5% of the respondents expressed feeling worried, and 80% said they felt uncertainty about the future (21).

### Research Hypothesis

Dental practice in El Salvador, in the face of the global COVID-19 pandemic, faces the challenges of high costs in implementing biosafety protocols, as well as dealing with psychological states of depression, stress, and anxiety.

### METHODOLOGY

The research methodology used was a quantitative approach, as data and information were collected from a specific situation and compared to a pre-established theory or hypothesis, from which the variables and indicators to be measured were established in a descriptive way, and a virtual instrument was used to evaluate and collect data for the research project. This allowed

the measurement of variable indicators, which were then tabulated and analyzed using the statistical software SPSS.

Due to its purpose, the research is of an applied type, since its objective is the use of the acquired knowledge.

Based on the occurrence of events, the research is of cross-sectional type, as it was conducted in the present time. The studied variables are: biosafety protocols, investment range (increase in treatment costs), depression, anxiety, and stress.

The units of analysis were dental professionals practicing in El Salvador, including those from public, private, and academic sectors. Virtual surveys were administered to them in which evaluation parameters were established in order to measure the objectives set for this research. Additionally, the convenience sample consisted of 112 volunteers.

The technique used was the survey, the responses were counted using Google Forms and the data were tabulated and entered into a data analysis matrix. The SPSS software was used for data analysis. The survey instrument was used to collect information on the variables outlined for this study. To measure depression, anxiety, and stress, the worldwide known DASS-21 scale was used, which has also been validated in El Salvador by Orellana C, Orellana L. in their study “Predictores de síntomas emocionales durante la cuarentena domiciliar por pandemia de COVID-19 en El Salvador” (Predictors of emotional



symptoms during residential lockdown due to the COVID-19 pandemic in El Salvador) (13).

## RESULTS

The results were obtained through virtual surveys conducted among the dental professionals who participated in the study. 75% of dentists who participated in this study were solely engaged in private practice, 17% were involved in institutional or governmental practice, and 9% were dedicated exclusively to teaching (Table 1).

Table 1. Occupation of the surveyed dentists.

	Frequency	Percentage
Teaching	9	8.0
Institutional practice, MINSAL, FOSALUD, ISSS, ISBM	19	17.0
Private practice	84	75%
Total	112	100.0

Source: Survey conducted among dental professionals for the research "Dental practice challenges in El Salvador in the face of the global COVID-19 pandemic".

The adjustments that dental care has undergone regarding the implementation of biosafety protocols, both in private and public settings, are governed by the technical guidelines for post-COVID-19 dental care, published by the Ministry of Health of the country (MINSAL). This regulation has outlined a series of steps to follow, which were listed in multiple-choice questions where participants could select more than one answer. The results showed that 92% of the respondents have spaced out appointments with a minimum of one hour per patient, and the same percentage have implemented temperature screenings for

their patients. 78% perform a triage prior to dental consultations, 65.2% provide biosafety to their patients, 61.6% have implemented the use of shoe disinfection trays, and only 0.9% use ozone for surface disinfection. It is important to note that the MINSAL is the regulatory entity that establishes the guidelines to be followed, and compliance should ideally be 100% in all cases (Table 2).

Table 2. Adjustments to dental care post-COVID-19 pandemic.

	Frequency	Percentage
Shoe disinfection tray	69	61.6%
Triage	88	78.6%
Temperature screening	103	92%
Patient biosafety	73	65.2%
1 hour spaced out appointments	103	92%
Ozonator	1	.9

Source: Survey conducted among dental professionals for the research "Dental practice challenges in El Salvador in the face of the global COVID-19 pandemic".

The implementation of triage within national or international care guidelines for patients is of utmost importance, since it allows filtering out those patients who may show suspicious symptoms that may reveal COVID-19 infection. Therefore, this should be strictly enforced, however, 83% of the respondents consider the prior execution of screening for COVID-19 warning signs to be very important, 14.3% consider it important, 1.8% consider it slightly important, and 0.9% consider it not important at all.



The protocols for dental care at the national level have been adapted from international protocols, taking into account procedures that can be easily performed and ensure the safety of both the patient and the operator. Taking into account that almost 75% of the respondents work in the private sector, 49.1% have opted to follow a hybrid protocol, which means they take into account the protocol provided by the national regulatory entity but also apply international protocols. Meanwhile, 44.1% of them use the national bio-safety protocol. 8.8% have not changed anything from their pre-pandemic practices, and 0.9% follow only the international protocol. In terms of the investment that professionals have had to make for the care of their patients, it was categorized into three ranges based on the amount of supplies required for each dental procedure; thus, 53.6% of the respondents stated that they invest an additional 5.00 to 10.00 USD per dental procedure, while 33% of them reported investing between 10.00–15.00 USD per patient, 8.9% of them make an investment between 15.00–20.00 USD, and 5.5% have not increased their investment (Table 3).

Table 3. Increase in costs for patient care during the COVID-19 pandemic.

	Frequency	Percentage
Between 10.00–15.00 USD	37	33.0
Between 15.00–20.00 USD	10	8.9
Between 5.00–10.00 USD	60	53.6
No increase	5	5.5
Total	112	100.0

Source: Survey conducted among dental professionals for the research "Dental practice challenges in El Salvador in the face of the global COVID-19 pandemic".

The direct costs that professionals have had to incur for patient care have increased the cost of dentists' fees. In a range of cost increases, 48.2% of the respondents reported an increase in their fees by 5.00 to 10.00 USD to cover the investments made during the COVID-19 pandemic. 24.1% of them mentioned an increase of 10.00–15.00 USD, while 14.3% have increased their fees by 15.00–20.00 USD. 12.5% of them have not increased their fees, and 0.9% increase their fees according to the procedure.

### DASS-21 Results

These were the stress related DASS-21 scale results: 59.8% of the respondents reported not experiencing any level of stress. 17% of the respondents reported experiencing a moderate level of stress, 10.7% reported experiencing a severe level of stress, 10.7% of the respondents reported feeling mild stress, while 1.8% of the respondents reported experiencing an extremely severe level of stress (Table 4).

Table 4. Stress levels among dental professionals during the COVID-19 pandemic.

	Frequency	Percentage
No stress	67	59.8
Mild stress	12	10.7
Moderate stress	19	17.0
Severe stress	12	10.7
Extremely severe stress	2	1.8
Total	112	100.0

Source: Survey conducted among dental professionals for the research "Dental practice challenges in El Salvador in the face of the global COVID-19 pandemic".



Regarding the level of depression, the scale revealed that 66.1% of the participants did not show signs of depression, 15.2% of the respondents showed signs of mild depression, and 10.7% of the participants experienced moderate depression. On the other hand, 8% of the respondents exhibited signs of depression ranging from severe to extremely severe, which should be taken into consideration for the development of programs addressing the needs of this population sector.

Regarding the level of anxiety, the measurement scale shows that 59.8% of the respondents did not exhibit any signs of anxiety, only 18.8% of the participants experienced moderate anxiety, and 10.7% of them displayed mild anxiety symptoms. Nearly 10% of the sample showed signs of severe and extremely severe anxiety, which aligns with the exhibited levels of depression

## Discussion of results

Adaptation to the new reality amid the COVID-19 pandemic has required the implementation of protocols to reduce the risk of transmission. MINSAL, as the governing body for healthcare processes at the national level, issued a protocol for dental office care that has served as the foundation for all public-level care.

The advantage of using this standard is the regulation of the entire patient care process. This regulatory framework has served as a basis for professional associations and dental specialists in the country to develop their own protocols, taking into account other international criteria that involve more sophisticated investments in bio-disinfection mechanisms.

According to the results of this research, although almost 70% of the participants belong to the private sector, approximately 40% of them reported using the national protocol ruled by MINSAL. One of the listed and important steps is the implementation of triage, since it is where potential cases of infected patients can be identified prior to dental care (17). This step is common in both national and international protocols, however, only nearly 70% of the respondents consider triage important in the process, when it should be considered important by 100% of them. Actions such as providing safety barriers to patients, using a shoe disinfection tray at the entrance of the clinic vary in terms of the percentage of use, indicating that not all respondents are aware of the advantages of implementing these measures as protective barriers for both the patient and themselves.

As for the economic implications of increased costs for dental care supplies, a recent study conducted in Brazil (14) established that the increase amounts to nearly 20% of the direct costs of dental procedures, leading to a significant rise in dental care expenses. In El Salvador, despite the regulations established by the Defensoría del Consumidor (Consumer Protection Agency), dental professionals have either absorbed the increased costs of supplies themselves or have raised their fees; according to the collected data, all participants had to invest more than 5.00 USD for the implementation of the care protocol, and as Sigua suggests (15), the challenges faced by dentists involve investment in protection measures for both staff and patients.



As for the DASS-21 results, the majority of respondents did not report experiencing stress, anxiety, or depression. Nevertheless, it is noteworthy that 30% of participants did experience some level of stress, anxiety, and depression, including extreme cases. The data is relevant, as mental health impacts the quality of decision-making and interpersonal relationships. The feeling of restlessness, anxiety, confusion, stress, or a combination of these emotions during a crisis, is not only normal but also understandable (16, 17).

The data from the research contrasts with the findings presented by Orellana, who measured depression, anxiety, and stress: DASS-21. The most significant results were that approximately 75% of the sample exhibited mild symptoms of depression, stress, and anxiety, while the remaining participants manifested symptoms ranging from moderate to extremely severe. The levels of these symptoms—depression, anxiety, and stress—were statistically higher in women under the age of 32 (17).

## CONCLUSIONS

The following conclusions can be drawn:

Among the biosecurity protocols adopted by the surveyed dentists, both national and international protocols are being followed. These protocols include the use of shoe disinfection trays, temperature screening, triage, biosafety measures for patients, spaced out appointments with

one patient per hour, and maintaining established strategies such as sterilization and asepsis of the dental office.

The surveyed dentists have mostly experienced cost increases per patient ranging from 5.00 to 10.00 USD, followed by an increase of 10.00 to 15.00 USD. These increased costs are often passed on to dental service customers.

The levels of depression and anxiety during the return to work indicate the presence of these conditions, however, in the sum of the test none of the participants scored zero, and 30% reported experiencing stress and anxiety ranging from mild to extremely severe

## RECOMMENDATIONS

*Addressed to the Evangelical University of El Salvador*  
Continue the line of research on the implications of the COVID-19 pandemic in the dental profession and how it will affect future practice

*Addressed to the Faculty of Dentistry*  
Find strategies that enable the implementation of improvement plans in favor of the academy and student practice.

*Addressed to the dentistry guild*  
Recognize signs of stress, anxiety, and depression.



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