Preventive measures for COVID-19 among dental students and dentists during the mandatory social isolation in Latin America and the Caribbean in 2020

Brenda Melissa Flores-Quispe[1,A–F], Renato Alejandro Ruiz-Reyes[1,A–F], Roberto Antonio León-Manco[1,A–F], Andrés Agudelo-Suárez[2,A–F]

[1] Faculty of Dentistry, Cayetano Heredia Peruvian University, Lima, Peru
[2] Faculty of Dentistry, University of Antioquia, Medellín, Colombia

A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation;
D – writing the article; E – critical revision of the article; F – final approval of the article

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Address for correspondence
Brenda Melissa Flores-Quispe
E-mail: brenda.flores.q@upch.pe

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Abstract

Background. Dentistry is one of the professions that are most exposed to the contagion with coronavirus disease 2019 (COVID-19). However, the prevalence and positivity rates of COVID-19 are low in dentists, indicating that the current measures of infection control may be sufficient to prevent infection in dental settings.

Objectives. The aim of the study was to determine whether the preventive measures for COVID-19 during the mandatory social isolation were followed by dental students and dentists in Latin America and the Caribbean in 2020.

Material and methods. A cross-sectional study was conducted using anonymous virtual surveys in a convenience sample of 2,036 dental students and dentists from 21 Latin American and Caribbean countries. The variables were the preventive measures for COVID-19 and the sociodemographic characteristics. Descriptive and bivariate analyses were performed.

Results. The final sample included 2,036 dental students and dentists. The self-perceived level of knowledge about COVID-19 was found to be associated with age, sex, body mass index (BMI), the type of academic training, having a specialty in the case of professionals, the place of origin, and having met someone with COVID-19 ($p < 0.05$). The self-perceived level of concern regarding COVID-19 was associated with sex, BMI and having met someone with COVID-19 ($p < 0.05$). The number of days in the mandatory social isolation was associated with age, the type of academic training, having a specialty, the place of origin, and having met someone with COVID-19 ($p < 0.05$). The confinement level was associated with age, sex, BMI, the type of academic training, and having met someone with COVID-19 ($p < 0.05$). Following the preventive measures for COVID-19 was associated with age, the type of academic training, having a specialty, the place of origin, and having met someone with COVID-19 ($p < 0.05$). The use of face masks, hand washing and social distancing were associated with age, BMI, the type of academic training, the place of origin, and having met someone with COVID-19 ($p < 0.05$).

Conclusions. Dental students and dentists followed the preventive measures for COVID-19 during the mandatory social isolation period in Latin America and the Caribbean in 2020.

Keywords: oral health, prevention and control, COVID-19, coronavirus infections

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Introduction

At the end of December 2019, the Chinese Ministry of Health notified the World Health Organization (WHO) about numerous cases of pneumonia of unknown etiology in Wuhan, China.[1,2] On January 7, 2020, the causative agent of this enigmatic pneumonia was identified as a novel coronavirus (2019-nCoV) by analyzing a throat swab taken from one of these patients.[2,3] The Coronavirus Study Group named this pathogen "severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)",[2,4] and the WHO named the disease caused by the virus "coronavirus disease 2019 (COVID-19)".[2,5] The WHO declared the SARS-CoV-2 outbreak a public health emergency of international concern (PHEIC) on January 30, 2020.[2,5]

There continues to be uncertainty regarding the propagation mechanism; 2019-nCoV uses the same receptor as SARS-CoV – angiotensin-converting enzyme 2 (ACE2). The principal mechanism of infection is via aerosol transmission by person-to-person contact, which occurs by respiratory droplets, but it can also be transmitted by the contaminated hands or surfaces. Transmission is possible for approx. 8 days since the occurrence of symptoms.[6] Patients may still have a positive pharyngeal smear result for several weeks after symptoms resolve.[6] The most common symptoms are cough, the shortness of breath, chest pain or pressure, a high fever (over 38°C), a sore throat, diarrhea, headache, muscle or joint pain, fatigue, and the loss of sense of taste and smell.[7] The pandemic unleashed by COVID-19 has changed people's lifestyles due to the ease of transmission and its high mortality rate in geriatric patients and patients with pre-existing diseases. The main measures to combat the virus are vaccination, standard preventive measures, such as the use of masks and social distancing, and timely treatment for those with symptoms. Countries have adopted different forms of mandatory social isolation, making it difficult for people to enjoy normal daily life and free movement while impacting education and the economy.[8] The pandemic has also had a major psychological impact by adding to the prevalence of anxiety and depression in the general population, which is increased in people with chronic diseases and, especially, in health care workers, who are constantly under stressful conditions.[9]

Dentistry is one of the professions with the greatest exposure to COVID-19.[10] This is due to the fact that the surfaces of both dental units and the contaminated materials act as major sources of infection during daily clinical practice for both the patient and the professional, especially with the use of rotary equipment.[11,12] However, the American Dental Association (ADA) reported that the prevalence and positivity rates of COVID-19 were low in dentists, indicating that the present measures of infection control may be sufficient to minimize risk in dental environment.[13] Among the measures adopted for dental practices during the pandemic is the use of personal protective equipment (PPE), which consists of face shields, glasses, masks, gloves, one-piece uniforms, caps, and disposable boots.[14] At the beginning of the pandemic, treatment for health emergencies only was ordered, following the established protection protocols.[15]

In Latin America and the Caribbean, the first country to have case reports was Brazil on February 25, 2020.[16] In a matter of weeks, countries across the region closed their borders and imposed restrictions. The response of many Latin America and Caribbean countries has not been entirely favorable, observing cases in which there are not enough ventilators to meet patient demand. As of January 13, 2021, a total of 16,724,800 cases of COVID-19 had been registered in Latin America and the Caribbean. Among the countries most affected are Brazil, Colombia, Argentina, Mexico, Peru, and Chile.[17] For this reason, various investigations have been carried out to analyze the impact of COVID-19 on dentists in this region.[18]

The aim of the study was to discuss the preventive measures for COVID-19 during the mandatory social isolation period among dental students and dentists in Latin America and the Caribbean in 2020.

Material and methods

Design, data collection and setting

A cross-sectional study was conducted based on the anonymous virtual surveys targeted at dental students and dentists aged 18–71 from 21 countries in Latin America and the Caribbean (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominica, Ecuador, El Salvador, Grenada, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Dominican Republic, Uruguay, and Venezuela). The information was organized by the Faculty of Dentistry of the University of Antioquia, Medellín, Colombia, in an Excel database with the records of another survey-based original study.[18] The survey was designed on the Google Forms platform. Due to time restrictions, a pilot study was carried out with a sample of only 30 participants to evaluate internal consistency and completion time; this is a limitation of the study. The survey was available online and distributed digitally between March and August 2020. It collected the sociodemographic data and incorporated questions about the COVID-19 pandemic. It is important to mention that, for this study in particular, the records of all dental students and dentists from Latin America and the Caribbean were evaluated. Records that did not include all the study variables were discarded, so a final sample of 2,036 records was obtained.

Variables

The self-perceived level of knowledge about COVID-19 and the self-perceived level of concern regarding COVID-19 were measured using a Likert 1–10 scale,

where 1 is the lowest rating and 10 is the highest. The number of days in the mandatory social isolation was measured in days, and the confinement level was categorized into "I have not gone out any day", "I have gone out very little", "I have gone out frequently", and "I have gone out every day". Whether the participants followed the preventive measures for COVID-19 was categorized into 'never', 'rarely', 'sometimes', 'usually', and 'always'. The use of face masks, hand washing and social distancing were evaluated with the yes/no options.

The sociodemographic characteristics were age, sex and the body mass index (BMI). The survey also determined the type of academic training, specialty, the location of origin (grouped in Mexico, Central America, the Caribbean together, and South America), whether the participants had met someone with COVID-19, and the COVID-19 information media.

Statistical analysis

A descriptive analysis of the variables was carried out. Subsequently, the use of non-parametric tests was determined using the Kolmogorov–Smirnov test. The Mann–Whitney *U* test was applied for dichotomous variables and the Kruskal–Wallis test was used for polytomous variables in the case of quantitative variables. For the qualitative variables, the χ^2 test for trend was used for ordinal scales. The study had a confidence level of 95% and $p < 0.05$ was considered to be statistically significant for all tests. The IBM SPSS Statistics for Windows software, v. 25.0 (IBM Corp., Armonk, USA) was used for the statistical analysis.

Results

The most frequently selected age range was 25–34 years at 36.79% (n = 749). There was a female predominance at 70.38% (n = 1,433). In relation to BMI, 62.41% (n = 1242) of the participants were at their normal weight. The majority were dentists at 64.44% (n = 1,312), of which 69.59% (n = 913) had a specialty. South America accounted for 91.94% (n = 1,872) of the respondents. In terms of contact, 48.43% (n = 986) had met someone with COVID-19, and 97.00% (n = 1,975) received their COVID-19 information through virtual media. According to the self-perceived level of knowledge about COVID-19, the median (*Me*) was 8.00 (quartile 1 (*Q1*)–quartile 3 (*Q3*): 7.00–8.00). The self-perceived level of concern regarding COVID-19 presented *Me* = 8.00 (7.00–10.00). The median number of days in the mandatory social isolation was 60.00 (55.00–72.00) and 79.27% (n = 1,614) reported having gone out very little outside their confinement. As for following the preventive measures for COVID-19, 69.74% (n = 1,420) reported that they always followed them; 91.16% (n = 1,856) used face masks and employed hand washing and social distancing (Table 1).

Table 1. Characteristics of dental students and dentists during the mandatory social isolation (N = 2,036)

Variable		Value
Age [years]	*M* ±*SD*	32.69 ±11.76
	18–24	606 (29.76)
	25–34	749 (36.79)
	≥35	681 (33.45)
Sex	male	603 (29.62)
	female	1,433 (70.38)
BMI[#] (N = 1,990) [kg/m^2]	underweight	83 (4.17)
	normal	1,242 (62.41)
	overweight	531 (26.68)
	obesity	134 (6.73)
Type of academic training	dental student	724 (35.56)
	dentist	1,312 (64.44)
Specialty[#] (N = 1,312)	yes	913 (69.59)
	no	399 (30.41)
Place of origin	Mexico, Central America and the Caribbean	164 (8.06)
	South America	1,872 (91.94)
Met someone with COVID-19	yes	986 (48.43)
	no	1,050 (51.57)
COVID-19 information media	traditional	61 (3.00)
	virtual	1,975 (97.00)
Self-perceived level of knowledge about COVID-19	*Me* (*Q1*–*Q3*)	8.00 (7.00–8.00)
Self-perceived level of concern regarding COVID-19	*Me* (*Q1*–*Q3*)	8.00 (7.00–10.00)
Number of days in the mandatory social isolation	*Me* (*Q1*–*Q3*)	60.00 (55.00–72.00)
Confinement level	I have not gone out any day	214 (10.51)
	I have gone out very little	1,614 (79.27)
	I have gone out frequently	117 (5.75)
	I have gone out every day	91 (4.47)
Following the preventive measures for COVID-19	never	2 (0.10)
	rarely	6 (0.29)
	sometimes	47 (2.31)
	usually	561 (27.55)
	always	1,420 (69.74)
Use of face masks, hand washing and social distancing	yes	1,856 (91.16)
	no	180 (8.84)

Unless marked otherwise, data presented as number (percentage) (n (%)).
BMI – body mass index; *M* – mean; *SD* – standard deviation; *Me* – median; *Q1* – quartile 1; *Q3* – quartile 3; COVID-19 – coronavirus disease 2019;
[#] responses with missing values.

The self-perceived level of knowledge about COVID-19 was associated with age ($p < 0.001$), sex ($p = 0.024$), BMI ($p = 0.038$), the type of academic training ($p < 0.001$), having a specialty in the case of professionals ($p = 0.035$), the place of origin ($p < 0.001$), and having met someone with COVID-19 ($p < 0.001$). The self-perceived level of concern regarding COVID-19 was associated with sex ($p < 0.001$), BMI ($p = 0.039$) and having met someone with COVID-19 ($p < 0.001$) (Table 2).

Discussion

COVID-19 is spread mainly person-to-person, most often by inhaling particles that are spread by an infected person. Therefore, vaccination and the monitoring of preventive measures are essential, especially in highly exposed professionals like dentists.[19,20] The knowledge about COVID-19 was associated with all variables except the COVID-19 information media. Kinariwala et al. found

Table 2. Knowledge and concern regarding coronavirus disease 2019 (COVID-19) of dental students and dentists during the mandatory social isolation ($N = 2,036$)

Variable		Self-perceived level of knowledge about COVID-19	*p*-value	Self-perceived level of concern regarding COVID-19	*p*-value
Age [years]	18–24	7.00 (6.00–8.00)	<0.001‡*	9.00 (7.00–10.00)	0.195‡
	25–34	7.00 (7.00–8.00)		8.00 (7.00–10.00)	
	≥35	8.00 (7.00–9.00)		8.00 (7.00–10.00)	
Sex	male	8.00 (7.00–9.00)	0.024†*	8.00 (6.00–10.00)	<0.001†*
	female	8.00 (7.00–8.00)		9.00 (7.00–10.00)	
BMI# ($N = 1,990$) [kg/m^2]	underweight	7.00 (6.00–8.00)	0.038‡*	8.00 (7.00–10.00)	0.039‡*
	normal	8.00 (6.00–8.00)		8.00 (7.00–10.00)	
	overweight	8.00 (7.00–8.00)		8.00 (7.00–10.00)	
	obesity	8.00 (7.00–9.00)		9.00 (8.00–10.00)	
Type of academic training	dental student	7.00 (6.00–8.00)	<0.001†*	9.00 (7.00–10.00)	0.129†
	dentist	8.00 (7.00–8.00)		8.00 (7.00–10.00)	
Specialty# ($N = 1,312$)	yes	8.00 (7.00–9.00)	0.035†*	8.00 (7.00–10.00)	0.922†
	no	8.00 (7.00–8.00)		8.00 (7.00–10.00)	
Place of origin	Mexico, Central America and the Caribbean	8.00 (7.00–9.00)	<0.001†*	8.50 (7.00–10.00)	0.782†
	South America	8.00 (7.00–8.00)		8.00 (7.00–10.00)	
Met someone with COVID-19	yes	8.00 (7.00–8.00)	<0.001†*	9.00 (7.00–10.00)	<0.001†*
	no	7.00 (6.00–8.00)		8.00 (7.00–10.00)	
COVID-19 information media	traditional	8.00 (7.00–8.00)	0.849†	8.00 (7.00–10.00)	0.390†
	virtual	8.00 (7.00–8.00)		8.00 (7.00–10.00)	

Data presented as *Me* (*Q1–Q3*). # responses with missing values; † Mann–Whitney *U* test; ‡ Kruskal–Wallis test; * statistically significant.

The number of days in the mandatory social isolation was associated with age ($p < 0.001$), the type of academic training ($p = 0.030$), having a specialty ($p < 0.001$), the place of origin ($p = 0.005$), and having met someone with COVID-19 ($p < 0.001$). The confinement level was associated with age ($p < 0.001$), sex ($p < 0.001$), BMI ($p < 0.001$), the type of academic training ($p < 0.001$), and having met someone with COVID-19 ($p = 0.002$) (Table 3).

Following the preventive measures for COVID-19 was associated with age ($p < 0.001$), the type of academic training ($p < 0.001$), having a specialty ($p = 0.004$), the place of origin ($p = 0.011$), and having met someone with COVID-19 ($p < 0.001$). The use of face masks, hand washing and social distancing were associated with age ($p < 0.001$), BMI ($p < 0.001$), the type of academic training ($p < 0.001$), the place of origin ($p = 0.003$), and having met someone with COVID-19 ($p = 0.002$) (Table 4).

an association between knowledge and age, in which the older group had significantly greater knowledge.[21] The tendency for older people to have more knowledge about the issues concerning COVID-19 may be due to the fact that older dentists are more aware of the need to continue education courses about infection control. As to the self-perceived level of concern regarding COVID-19, there was an association with sex and BMI, and it was lesser in those who did not meet anybody with COVID-19. It is important to keep in mind that the level of concern regarding COVID-19 is a subjective assessment that respondents provided on a Likert scale, in which the lowest value indicates no concern and the highest value represents great concern. This concern can be the cause of anxiety; Martina et al. found a relationship between concern and anxiety, with the majority of the concerned respondents being female and those at risk of treating a patient with a cough or suspected of being infected with COVID-19.[22] In the case of BMI, scientific evidence has shown that obesity

Table 3. Number of days in the mandatory social isolation and the confinement level of dental students and dentists during the mandatory social isolation ($N = 2,036$)

Variable		Number of days in the mandatory social isolation *Me* (*Q1–Q3*)	*p*-value	Confinement level *n* (%)				*p*-value
				I have not gone out any day	I have gone out very little	I have gone out frequently	I have gone out every day	
Age [years]	18–24	60.00 (60.00–70.00)	<0.001‡*	123 (20.30)	426 (70.30)	46 (7.59)	11 (1.82)	<0.001§*
	25–34	60.00 (47.00–70.00)		50 (6.68)	621 (82.91)	44 (5.87)	34 (4.54)	
	≥35	61.00 (56.00–85.00)		41 (6.02)	567 (83.26)	27 (3.96)	46 (6.75)	
Sex	male	60.00 (50.00–70.00)	0.082†	38 (6.30)	482 (79.93)	51 (8.46)	32 (5.31)	<0.001§*
	female	60.00 (55.00–72.00)		176 (12.28)	1,132 (79.00)	66 (4.61)	59 (4.12)	
BMI# ($N = 1,990$) [kg/m^2]	underweight	60.00 (60.00–70.00)	0.171‡	14 (16.87)	65 (78.31)	4 (4.82)	0 (0.00)	<0.001§§*
	normal	60.00 (54.00–70.00)		144 (11.59)	974 (78.42)	75 (6.04)	49 (3.95)	
	overweight	60.00 (54.00–75.00)		37 (6.97)	436 (82.11)	28 (5.27)	30 (5.65)	
	obesity	61.00 (54.00–85.00)		13 (9.70)	101 (75.37)	8 (5.97)	12 (8.96)	
Type of academic training	dental student	60.00 (60.00–70.00)	0.030†*	128 (17.68)	525 (72.51)	60 (8.29)	11 (1.52)	<0.001§*
	dentist	60.00 (52.00–75.00)		86 (6.55)	1,089 (83.00)	57 (4.34)	80 (6.10)	
Specialty# ($N = 1,312$)	yes	60.00 (54.00–80.00)	<0.001†*	57 (6.24)	767 (84.01)	41 (4.49)	48 (5.26)	0.213§
	no	60.00 (50.00–70.00)		29 (7.27)	322 (80.70)	16 (4.01)	32 (8.02)	
Place of origin	Mexico, Central America and the Caribbean	63.00 (60.00–79.50)	0.005†*	14 (8.54)	137 (83.54)	5 (3.05)	8 (4.88)	0.334§
	South America	60.00 (54.00–70.00)		200 (10.68)	1,477 (78.90)	112 (5.98)	83 (4.43)	
Met someone with COVID-19	yes	60.00 (50.00–85.00)	0.001†*	86 (8.72)	803 (81.44)	45 (4.56)	52 (5.27)	0.002§*
	no	60.00 (56.00–70.00)		128 (12.19)	811 (77.24)	72 (6.86)	39 (3.71)	
COVID-19 information media	traditional	62.00 (54.00–79.00)	0.698†	5 (8.20)	47 (77.05)	3 (4.92)	6 (9.84)	0.213§
	virtual	60.00 (55.00–72.00)		209 (10.58)	1,567 (79.34)	114 (5.77)	85 (4.30)	

responses with missing values; † Mann–Whitney U test; ‡ Kruskal–Wallis test; § χ^2 test; §§ χ^2 test for trend; * statistically significant.

Table 4. Following the preventive measures and protection recommendations for coronavirus disease 2019 (COVID-19) among dental students and dentists during the mandatory social isolation ($N = 2,036$)

Variable		Following the preventive measures for COVID-19					*p*-value	Use of face masks, hand washing and social distancing		*p*-value
		never	rarely	sometimes	usually	always		yes	no	
Age [years]	18–24	0 (0.00)	3 (0.50)	30 (4.95)	193 (31.85)	380 (62.71)	<0.001§§*	519 (85.64)	87 (14.36)	<0.001§§*
	25–34	2 (0.27)	1 (0.13)	11 (1.47)	230 (30.71)	505 (67.42)		677 (90.39)	72 (9.61)	
	≥35	0 (0.00)	2 (0.29)	6 (0.88)	138 (20.26)	535 (78.56)		660 (96.92)	21 (3.08)	
Sex	male	0 (0.00)	3 (0.50)	12 (1.99)	175 (29.02)	413 (68.49)	0.513§	548 (90.88)	55 (9.12)	0.773§
	female	2 (0.14)	3 (0.21)	35 (2.44)	386 (26.94)	1,007 (70.27)		1,308 (91.28)	125 (8.72)	
BMI# ($N = 1,990$) [kg/m^2]	underweight	0 (0.00)	1 (1.20)	1 (1.20)	26 (31.33)	55 (66.27)	0.360§	65 (78.31)	18 (21.69)	<0.001§*
	normal	2 (0.16)	4 (0.32)	33 (2.66)	342 (27.54)	861 (69.32)		1,122 (90.34)	120 (9.66)	
	overweight	0 (0.00)	1 (0.19)	7 (1.32)	155 (29.19)	368 (69.30)		499 (93.97)	32 (6.03)	
	obesity	0 (0.00)	0 (0.00)	6 (4.48)	29 (21.64)	99 (73.88)		127 (94.78)	7 (5.22)	
Type of academic training	dental student	2 (0.28)	3 (0.41)	30 (4.14)	237 (32.73)	452 (62.43)	<0.001§§*	621 (85.77)	103 (14.23)	<0.001§*
	dentist	0 (0.00)	3 (0.23)	17 (1.30)	324 (24.70)	968 (73.78)		1,235 (94.13)	77 (5.87)	
Specialty# ($N = 1,312$)	yes	0 (0.00)	2 (0.22)	12 (1.31)	205 (22.45)	694 (76.01)	0.004§§*	864 (94.63)	49 (5.37)	0.238§
	no	0 (0.00)	1 (0.25)	5 (1.25)	120 (30.08)	273 (68.42)		371 (92.98)	28 (7.02)	
Place of origin	Mexico, Central America and the Caribbean	0 (0.00)	0 (0.00)	0 (0.00)	34 (20.73)	130 (79.27)	0.011§§*	160 (97.56)	4 (2.44)	0.003§*
	South America	2 (0.11)	6 (0.32)	47 (2.51)	527 (28.15)	1,290 (68.91)		1,696 (90.60)	176 (9.40)	
Met someone with COVID-19	yes	0 (0.00)	3 (0.30)	20 (2.03)	231 (23.43)	732 (74.24)	<0.001§§*	919 (93.20)	67 (6.80)	0.002§*
	no	2 (0.19)	3 (0.29)	27 (2.57)	330 (31.43)	688 (65.52)		937 (89.24)	113 (10.76)	
COVID-19 information media	traditional	0 (0.00)	1 (1.64)	1 (1.64)	20 (32.79)	39 (63.93)	0.290§	53 (86.89)	8 (13.11)	0.233§
	virtual	2 (0.10)	5 (0.25)	46 (2.33)	541 (27.39)	1,381 (69.92)		1,803 (91.29)	172 (8.71)	

Data presented as *n* (%). # responses with missing values; § χ^2 test; §§ χ^2 test for trend; * statistically significant.

is a risk factor for mortality from COVID-19; therefore, people with this condition would be more concerned.[2] In the present study, the majority of respondents were women, which could cause greater variability in responses as compared to men, resulting in a statistical difference due to the heterogeneity of the sample. In addition, dentists may be concerned about the risk of infection from their coworkers or patients, which would generate the fear of infecting their family members.[23]

The mandatory social isolation was associated with professional formation. Vieira-Meyer et al. conducted a study in which they evaluated the development of clinical practices during the mandatory isolation in relation to the knowledge of COVID-19.[24] They found an inverse relationship; the greater the knowledge, the less compliance with social isolation restrictions.[24] No articles have been found on the association of isolation with the sociodemographic characteristics. However, Vieira-Meyer et al. reported that the knowledge of COVID-19 was closely related to a higher academic degree, and the latter was inversely related to the mandatory isolation.[24] Possibly, it was due to the type of specialized work the dentists performed. In that study, they worked in public entities; however, the study did not have a representative sample to generalize the findings.[24]

According to the preventive measures for COVID-19, such as the use of masks, hand washing and social distancing, it was reported that most of the population always followed the measures, with a predominance in the older group and in those who had met someone with COVID-19. These results are similar to those found in studies by Hleyhel et al. and Khader et al. with regard to preventive measures.[25,26] Gasparro et al. also found an association between following preventive measures and age as well as the clinical attention provided to possible COVID-19 patients.[27] Ahmed et al. found that due to clinical attention and explaining the measures to be taken in the event of a suspected COVID-19 case, the use of masks and the frequency of hand washing increased.[28] The results found in the present study are similar to those previously mentioned. This is because older people represent a population at greater risk from the imminent pandemic, which is why they adopt higher-level preventive measures.

In the same way, dentists who are exposed to aerosols while providing treatment to a patient with suspected infection can experience high levels of fear of COVID-19 contagion. The fear generates a strategic adaptation in order to find protection, which leads to the automatic monitoring of the established preventive measures. Dentistry has always elaborated protocols during the years of training on biosafety measures in clinical practice to avoid the spread of other infectious agents. Given the circumstances of the current pandemic and according to the WHO indications, hand hygiene is considered the first step to limit the spread of COVID-19. Therefore, hand washing with an alcohol-based sanitizer or soap and water should be performed before and after treating each patient. In addition, although surgical masks have always been used during dental treatment, the use of an N95 respirator is incorporated as a new measure, which is part of PPE. This is essential to prevent the inhalation of respiratory droplets.[26–29]

Limitations

This study has limitations. The 1st limitation is the type of validation of the survey. The 2nd limitation is the way in which the self-perceived level of knowledge and concern regarding COVID-19 were subjectively measured on the Likert scale. In addition, due to the temporality of the information, knowledge and attitudes may vary as research progresses. Another limitation is that the responses obtained did not cover all the countries in the region affected by the COVID-19 pandemic, especially when there are countries more affected than others. Furthermore, the policies, information and restrictions of each country are different, which could directly influence the responses of the participants. Consequently, the findings of this study should be interpreted carefully and not globalized.

Despite these limitations, the present findings may have significant implications for the public health policy. At the beginning of the pandemic, dentists showed great uncertainty due to the lack of knowledge of the disease, the risk of infection and mortality due to the high exposure they have when treating patients, which is greater than in most other professions.[10,19] In general, governments must allocate sufficient funds to develop adequate public policies for the implementation of preventive measures for health care personnel. Also, access to information for dental students and dentists on the preventive measures for COVID-19 in dental care can be improved through dissemination in different virtual information media. Therefore, it is necessary to identify and understand the preventive measures against COVID-19 in order to expand knowledge about biosafety standards and prevent the spread of the virus in dental practices.

Conclusions

Dental students and dentists followed the preventive measures for COVID-19 during the mandatory social isolation period in Latin America and the Caribbean in 2020. An association was found between the self-perceived level of knowledge about COVID-19, the self-perceived level of concern regarding COVID-19, the number of days in the mandatory social isolation, the confinement level, following the preventive measures for COVID-19, and the use of face masks, hand washing and social distancing with the sociodemographic characteristics and having met someone with COVID-19. Some differences in the level of significance according to the type of analyzed variables were also observed.

Ethics approval and consent to participate

The Research Ethics Committee at the Faculty of Dentistry of the University of Antioquia approved the study (Act 9-2020). The study followed the international standards for virtual surveys, and the respondents provided informed consent prior to completing the questionnaire. Confidentiality was guaranteed throughout the investigation process in accordance with the Declaration of Helsinki.

Data availability

All data generated and/or analyzed during this study is included in this published article.

Consent for publication

Not applicable.

ORCID iDs

Brenda Melissa Flores-Quispe https://orcid.org/0000-0003-2076-0106
Renato Alejandro Ruiz-Reyes https://orcid.org/0000-0003-1480-5136
Roberto Antonio León-Manco https://orcid.org/0000-0001-9641-1047
Andrés Agudelo-Suárez https://orcid.org/0000-0002-8079-807X

References

1. He F, Deng Y, Li W. Coronavirus disease 2019 (COVID-19): What we know? *J Med Virol*. 2020;92(7):719–725. doi:10.1002/jmv.25766
2. Harapan H, Itoh N, Yufika A, et al. Coronavirus disease 2019 (COVID-19): A literature review. *J Infect Public Health*. 2020;13(5):667–673. doi:10.1016/j.jiph.2020.03.019
3. Hui DS, Azhar EI, Madani TA, et al. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health – the latest 2019 novel coronavirus outbreak in Wuhan, China. *Int J Infect Dis*. 2020;91:264–266. doi:10.1016/j.ijid.2020.01.009
4. Gorbalenya AE, Baker SC, Baric RS. Severe acute respiratory syndrome-related coronavirus: The species and its viruses – a statement of the Coronavirus Study Group. *bioRxiv*. 2020. doi:10.1101/2020.02.07.937862
5. Burki TK. Coronavirus in China. *Lancet Respir Med*. 2020;8(3):238. doi:10.1016/S2213-2600(20)30056-4
6. Pascarella G, Strumia A, Piliego C, et al. COVID-19 diagnosis and management: A comprehensive review. *J Intern Med*. 2020;288(2):192–206. doi:10.1111/joim.13091
7. Struyf T, Deeks JJ, Dinnes J, et al.; Cochrane COVID-19 Diagnostic Test Accuracy Group. Signs and symptoms to determine if a patient presenting in primary care or hospital outpatient settings has COVID-19 disease. *Cochrane Database Syst Rev*. 2020.7;7(7):CD013665. doi:10.1002/14651858.CD013665
8. Durán-Ojeda G. Preclinical simulation courses in dental education with COVID-19 pandemic [in Spanish]. *Odovtos – Int J Dent Sci*. 2020;22(2):11–13. doi:10.15517/IJDS.2020.41496
9. Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public – a systematic review and meta-analysis. *Psychiatry Res*. 2020;291:113190. doi:10.1016/j.psychres.2020.113190
10. Gambarini G, Galli M, Gambarini E, et al. Fine aerosols and perceived risk of COVID-19 among Italian dental practitioners: An experimental survey. *J Contemp Dent Pract*. 2020;21(6):599–603. PMID:33025925.
11. Passarelli PC, Rella E, Manicone PF, Garcia-Godoy F, D'Addona A. The impact of the COVID-19 infection in dentistry. *Exp Biol Med (Maywood)*. 2020;245(11):940–944. doi:10.1177/1535370220928905
12. Villani FA, Aiuto R, Paglia L, Re D. COVID-19 and dentistry: Prevention in dental practice, a literature review. *Int J Environ Res Public Health*. 2020;17(12):4609. doi:10.3390/ijerph17124609
13. Estrich CG, Mikkelsen M, Morrissey R, et al. Estimating COVID-19 prevalence and infection control practices among US dentists. *J Am Dent Assoc*. 2020;151(11):815–824. doi:10.1016/j.adaj.2020.09.005
14. Luzzi V, Ierardo G, Bossù M, Polimeni A. COVID-19: Pediatric oral health during and after the COVID-19 pandemic. *Int J Paediatr Dent*. 2021;31(1):20–26. doi:10.1111/ipd.12737
15. 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;17(9):3151. doi:10.3390/ijerph17093151
16. Burki T. COVID-19 in Latin America. *Lancet Infect Dis*. 2020;20(5):547–548. doi:10.1016/S1473-3099(20)30303-0
17. Ríos A. Number of confirmed cases of the novel coronavirus (COVID-19) in Latin America and the Caribbean, by country [in Spanish]. Statista. https://es.statista.com/estadisticas/1105121/numero-casos-COVID-19-america-latina-caribe-pais/. Accessed January 30, 2021.
18. León-Manco RA, Agudelo-Suárez AA, Armas-Vega A, et al. Perceived stress in dentists and dental students of Latin America and the Caribbean during the mandatory social isolation measures for the COVID-19 pandemic: A cross-sectional study. *Int J Environ Res Public Health*. 2021;18(11):5889. doi:10.3390/ijerph18115889
19. Gambarini E, Galli M, Di Nardo D, et al. A survey on perceived COVID-19 risk in dentistry and the possible use of rapid tests. *J Contemp Dent Pract*. 2020;21(7):718–722. PMID:33020352.
20. Habas K, Nganwuchu C, Shahzad F, et al. Resolution of coronavirus disease 2019 (COVID-19). *Expert Rev Anti Infect Ther*. 2020;18(12):1201–1211. doi:10.1080/14787210.2020.1797487
21. Kinariwala N, Samaranayake L, Perera I, Patel Z. Knowledge, awareness and perceptions of coronavirus disease 2019 (COVID-19) in a cohort of Indian dental professionals: A questionnaire-based study. *Preprints*. 2020:2020050442. doi:10.20944/preprints202005.0442.v1
22. Martina S, Amato A, Rongo R, Caggiano M, Amato M. The perception of COVID-19 among Italian dentists: An orthodontic point of view. *Int J Environ Res Public Health*. 2020;17(12):4384. doi:10.3390/ijerph17124384
23. Sezgin GP, Çapan BS. Assessment of dentists' awareness and knowledge levels on the novel coronavirus (COVID-19). *Braz Oral Res*. 2020;34:e112. doi:10.1590/1807-3107bor-2020.vol34.0112
24. Vieira-Meyer APGF, Coutinho MB, Santos HPG, Saintrain MV, Candeiro GTdeM. Brazilian primary and secondary public oral health attention: Are dentists ready to face the COVID-19 pandemic? *Disaster Med Public Health Prep*. 2020:1–8. doi:10.1017/dmp.2020.342
25. Hleyhel M, Haddad C, Haidar N, Charbachy M, Saleh N. Determinants of knowledge and prevention measures towards COVID-19 pandemic among Lebanese dentists: A cross sectional survey. *BMC Oral Health*. 2021;21(1):241. doi:10.1186/s12903-021-01599-9
26. Khader Y, Al Nsour M, Al-Batayneh OB, et al. Dentists' awareness, perception, and attitude regarding COVID-19 and infection control: Cross-sectional study among Jordanian dentists. *JMIR Public Health Surveill*. 2020;6(2):e18798. doi:10.2196/18798
27. Gasparro R, Scandurra C, Maldonato NM, et al. Perceived job insecurity and depressive symptoms among Italian dentists: The moderating role of fear of COVID-19. *Int J Environ Res Public Health*. 2020;17(15):5338. doi:10.3390/ijerph17155338
28. Ahmed MA, Jouhar R, Ahmed N, et al. Fear and practice modifications among dentists to combat novel coronavirus disease (COVID-19) outbreak. *Int J Environ Res Public Health*. 2020;17(8):2821. doi:10.3390/ijerph17082821
29. Meng L, Hua F, Bian Z. Coronavirus disease 2019 (COVID-19): Emerging and future challenges for dental and oral medicine. *J Dent Res*. 2020;99(5):481–487.doi:10.1177/0022034520914246