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ORIGINAL

Prevalence of COVID-19 in oral health professionals of the Balearic Islands in the period of confinement and start of the deescalated

Prevalencia de la COVID-19 en profesionales de la salud bucodental de las Illes Balears en el período de encierro e inicio de la desescalada

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Abstract

The aim of the present study is to perform an anonymous, quantitative and descriptive analysis about the prevalence of COVID-19 infections in oral care professionals in the Autonomous Community of the Balearic Islands, during the confinement of the popula- tion and the beginning of the deescalated. For this, an online self-filling survey was used. It was sento to the oral care professionals working in the Balearic Islands. Dentists and stomatologists (DS), superior technicians in oral hygiene (OH) and superior techni- cians in dental prosthesis (DP). The oral care professionals received and answered the survey in the period between June 1st and 30th 2020, using a form served through the Google Forms Gsuit application. 148 professionals responded to the survey, of which 4% reported a positive serology to COVID-19. All positive professionals were from Mallorca and from urban (83,3%) and semi-urban areas (16,6%). Significantly more OH (76%) and DP (88%) did not undergone the COVID test in comparison with DS (49%, p = 0.0008). There was no statistically significant difference between the different professionals regarding the fear of contracting the virus. There was also no statistically significant diference between the type of mask (p=0.6166) used by the professionals. With the results of the present study was possible to find a prevalence of 4% of COVID-19 infection among the oral care professionals of the Balearic Islands who answered the survey.

Key words: SARS-CoV-2, COVID-19, coronavirus infections, prevalence, epidemiology, dentistry.

Resumen

El objetivo del presente estudio es realizar un análisis anónimo, cuantitativo y descriptivo sobre la prevalencia de contagios por el COVID-19 en los profesionales de la salud bucal de la Comunidad Autónoma de las Illes Balears, durante el confinamiento de la población y el inicio de la desescalada. Para ello, se utilizó una encuesta de autocompletado on line. Fue enviado a los profesionales de la salud bucal que trabajan en las Islas Baleares como Odontólogos y estomatólogos (OE), técnicos superiores en higiene bucal (HB) y técnicos superiores en prótesis dental (PD). Los profesionales de la salud bucal recibieron y respondieron la encuesta en el período comprendido entre el 1 y 30 de junio de 2020, utilizando un formulario servido a través de la aplicación Google Forms Gsuit. 148 profesionales respondieron a la encuesta, de los cuales el 4% informó una serología positiva frente al COVID-19. Todos los profesionales positivos eran de Mallorca, de zonas urbanas (83,3%) y semiurbanas (16,6%). Las HB (76%) y los PD (88%) no se sometieron a la prueba COVID-19 en comparación con los OE (49%, p = 0,0008). No hubo diferencias estadísticamente significativas entre los diferentes profesionales en cuanto al miedo a contraer el virus. Tampoco hubo diferencias estadísticamente significativas entre el tipo de máscara utilizada por los profesionales (p = 0,6166). Los resultados del presente estudio pusieron de manifiesto una prevalencia del 4% de la infección por el COVID-19, entre los profesionales de la salud bucal de Baleares que respondieron la encuesta.

Palabras clave: SARS-CoV-2, COVID-19, infección por coronavirus, prevalencia, epidemiología, odontología.

Introduction

After a cluster of pneumonia cases emerged in the city of Wuhan (Hubei province, China) in December 2019, the Chinese authorities identified a new virus from the Coronaviridae family as the causative agent of the outbreak, called by international consensus COVID-19[1]. The Emergency Committee of the International Health Regulations (IHR, 2005)[2] declared the outbreak as a Public Health Emergency of International Importance at its meeting on January 30, 2020. Later, the World Health Organization (WHO) recognized it as a global pandemic on 11 March 2020[3].

In Spain, the first case of coronavirus infection was reported on January 31 2020, and at the time the data collection for this study was closed, there were 314362 confirmed cases and 28503 deaths due to this infection[3], being the 11th country in the worldwide rank of confirmed cases[4]. Considering this, Spain represents a relevant country to be studied in this specific pandemic situation.

As a matter of fact, the management of patients by professionals involved in oral care has required barrier methods that provide security against infectious-contagious diseases, mainly against acquired immunodeficiency syndrome (AIDS) and the different types of viral hepatitis, among others. Performing equipment sterilization, disinfection of surfaces and the use of disposable material and professional protection with gloves and masks, has been the norm to ensure safe treatments for the professional and the patient in order to avoid direct and/or or crossed infections[5]. With the appearance of this new pandemic caused by COVID-19, the previously barrier methods used by oral care professionals do not provide the same guarantees of safety, due to the high degree of contagiousness and severity of COVID -19, being necessary the adaptation of new individual protection measures[6].

This pandemic has created a state of insecurity among the professionals who provide oral care, which makes necessary information and research to adequately adapt objective and safe protocols to the new protection needs, such as the modification of techniques that use refrigeration aerosols of clinical rotary material, widely used in dentistry. Then, it is of great importance to obtain relevant data about the changes produced in oral care, in order to answer emerging questions during this pandemic stage that can be also used in future stages. It is also an appropriate period for dental schools to expand the learning outcomes of their courses to include additional roles of dentistry that take into consideration the current pandemic situation[7].

The Dental Academy of Mallorca (ADEMA) of the University of the Balearic Islands, has implemented a survey to dentists and stomatologists (DS), superior techni- cians in oral hygiene (OH) and superior technicians in dental prosthesis (DP) about the relevant aspects and changes in their work and personal situation in face of the COVID- 19, during the population confinement period and at the start of the de-escalation in the autonomous community of the Balearic Islands. The objective of this survey is to obtain information to adapt the necessary protection measures against COVID-19 in each of the different professions that participate and optimize protocols to carry out responsible and safe treatments for patients in dental clinics and in the handling of dental materials in dental prosthesis laboratories. Besides, the survey aims to obtain a broad and multidisciplinary database that allows a prediction of the global vision in oral care in the face of the new situation caused by COVID-19. It contains the general items from the two national surveys carried out by the Spanish Dental Council on April 6 and May 11 2020, carried out jointly with the Spanish Society of Oral Public Health[8].

Thus, the aim of the present study is to perform an anonymous, quantitative and descriptive analysis about the prevalence of COVID-19 infections in oral care professionals and their significant determining factors, in the Autonomous Community of the Balearic Islands, during the confinement of the population and the beginning of the deescalation.

Methods

The survey form was sent to 797 DS, 500 OH and 185 DP of the Balearic Islands, with a total of 1482 recipients. There were no exclusion criteria since the only condition was the professional registration in the Spanish Dental Council. The survey was sent through the emails of the professionals published in the directories of the referenced professional associations and schools in the Autonomous Community of the Balearic Islands. An information section to the participant and an informed consent, approved by the Research Ethics Committee of the Balearic Islands (No. IB 4236/20 PI), was sent together with the survey. The professional personal data was not required in the survey so it was absolutely anonymous and voluntary.

Once the participant's informed consent (IC) was accepted, the forms were answered and the participant clicked "send", the responses required were automatically registered on the Google Gsuit program server. The answers were transferred to a spreadsheet, and graph and tables were obtained from the application. The results did not contain any identifying data or the email address of the participants, which ensures data protection and makes the survey absolutely anonymized.

The sent survey used the online self-filling method, with free access to the oral care professionals of the Balearic Islands. Therefore, there was not a specific answer sheet

for each participant, but the answers were accumulated and once the 30-minute period to answer the form was closed, all data was subsequently exported to the worksheets calculation to proceed to the analysis of the results when the 30-day period started on (June 1 to 30, 2020) was finished. Each participant had a limited time of 30 minutes to answer the survey.

Statistical analysis

For the statistical analysis the SPSS software was used. A Fisher's exact test was performed for the group comparisons and a Pearson's correlation coefficient for the analysis of the correlation between the prevalence of the COVID-19 and the evaluated factors.

Results

Sociodemographic and professional data

E-mail with the survey form were sent to 1482 oral care professionals in the four Balearic Islands: Mallorca, Menorca, Ibiza and Formentera. Results were obtained from 148 answers. Therefore, the non-response rate was approximately 90%. There was a greater percentage of answers from Mallorca (83.1%), followed by Menorca (7%), Ibiza (9.5%) and Formentera (0.7%). The professional age ranging from 20 to 63 years old, with 58.1% being female responses and 41.9% male. When analyzing the Population Typology of the professionals that answered the survey 83.8% were from the urban areas of the islands, 10.1% from semi-urban areas and 6.1% from Rural areas. Regarding their occupation in the clinical practice, 71.6% of the professionals were DS, 12.2% OH, 11.5% were DP and 4.7% were exerting other services, such as manager or administrative assistant. 37.2% of the oral care professionals had more than 20 years of experience, 35.1% had from 10 to 20 years, 15.5% had 5 to 10 years, 5.4% had 3 to 5 years and 6.8% had 0 to 2 years. From the professionals that answered the survey 68.9% of them work in their own private clinics, 23% in private clinics of other professionals and 8.1% of them worked in the public sector. All percentages and participants number are stated on **table I**.

COVID-19 infection data

From all oral health professionals that answered the survey, 56.1% of them had not been tested for COVID-19, 39.2% of them were tested with negative results, 4.0% had a positive result and 0,64% were waiting the test result. About the symptomatology, 79.7% of the professionals did not present any COVID-19 symptom, whereas 20.3% did present. For 50.0% of the professionals that presented signs and symptoms, these symptoms lasted less than 3 days. For 28.1% it lasted from 4 to 7 days, 8 to 13 days for 12.5% and 14 days or more for 9.4%. About the anxiety sensation caused by the fear of being infected by the COVID-19, among the DS, OH and DP that answered the survey (148), 56.8% of them reported to be worried about the virus, 29.7% of them were very worried and 13.5% were not worried.

Prevalence of oral health professionals infected with COVID-19

All oral health professionals that passed by the COVID test with a positive serology were from Mallorca (**Figure 1**) and from urban (83.3%) and semi-urban areas (16.6%), being 7.0% and 5.0% of all professionals that answered the survey in each area, respectively (**Figure 2**). Age, gender and the work exerted in the clinical practice were not significant factors between the infected professionals. However, significantly more OH (76.0%) and DP (88.0%) did not undergone the COVID test in comparison with DS (49.0%, p=0.0008), among the professionals that answered the survey (**Figure 3**).

Table I: Sociodemographic and professional data responses distribution.

Survey items	*Number of participants (%)*
Gender	**148 answers (100%)**
Female	86 (58.1%)
Male	62 (41.9%)
Professional	**148 answers (100%)**
Dentist and Stomatologist	106 (71.6%)
Superior technicians in oral hygiene	18 (12.2%)
Superior technicians in dental prosthesis	17 (11.5%)
Others	7 (4.7%)
Source area	**148 answers (100%)**
Mallorca	123 (83.1%)
Ibiza	14 (9.5%)
Menorca	9 (7%)
Formentera	1 (0.7%)
Area	**148 answers (100%)**
Urban area	124 (83.8%)
Semi-urban area	15 (10.1%)
Rural area	9 (6.1%)
Years of experience working	**148 answers (100%)**
0-2 years	10 (6.8%)
3-5 years	8 (5.4%)
5-10 years	23 (15.5%)
10-20 years	52 (35.1%)
More than 20 years	55 (37.2%)
Work condition	**148 answers (100%)**
Public sector	12 (8.1%)
Own private clinic	102 (68.9%)
Private clinic of another person	34 (23%)

Figure 1: Prevalence (%) of oral care professionals that tested positive, tested and are waiting the results, tested negative or did not undergo the COVID-19 test.

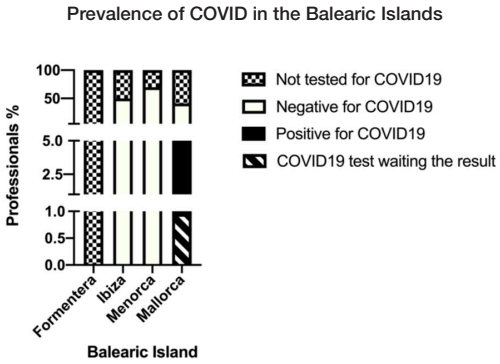


Figure 2: Prevalence (%) of the different oral care professionals that tested positive, tested and are waiting the results, tested negative or did not undergo the COVID-19 test.

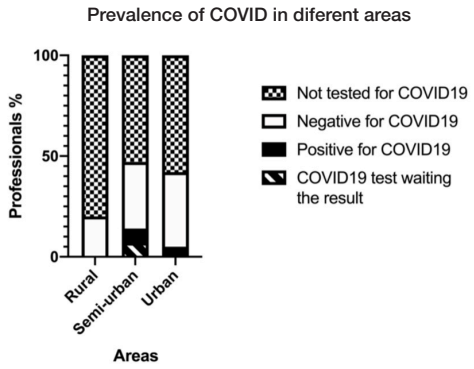


Figure 3: Prevalence (%) of COVID-19 in the different occupations of the dental practice.

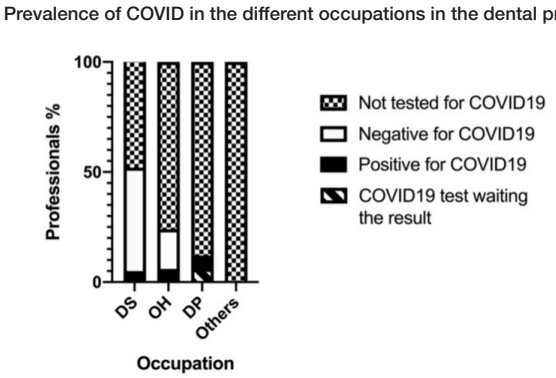


Figure 4: Prevalence (%) of COVID-19 depending on the professionals experience.

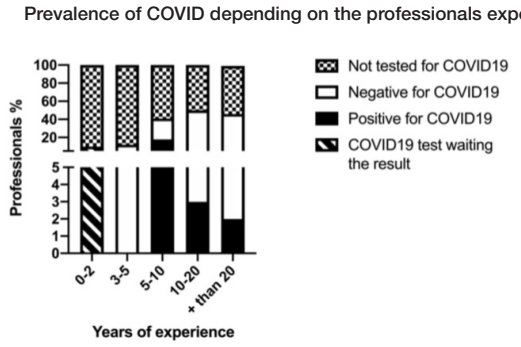


Figure 5: Prevalence of COVID-19 and the type of used mask.

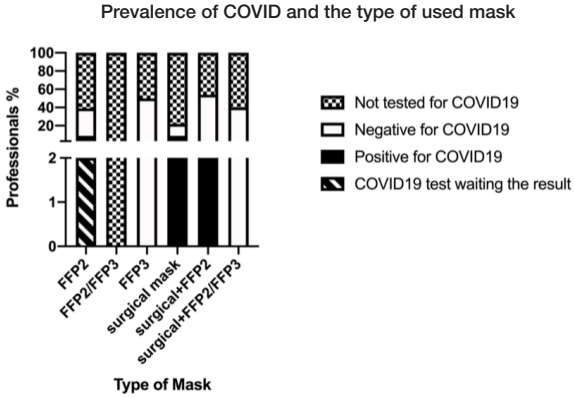
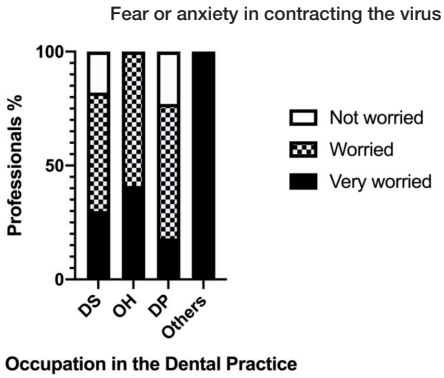


Figure 6: Fear or anxiety of contracting the virus among the oral care professionals.



About the years of experience of the participant, there was a significantly higher prevalence of infection by COVID-19 in the oral care workers with professional experience between 5 to 10 years (p=0.0093) (**Figure 4**). The infected professionals worked in the private sector, with no statistically significant difference between private and public sectors (p=0.6683).

When analyzing the prevalence of infected professional with the type of mask used, there was also no statistically significant diference between the type of mask (p=0.6166). It was found that, from the 46 professionals who reported using filtering face-piece respirators FFP2 masks, there were 3 (7.0%) who resulted positive in the test, while 2 (9.0%) of the 23 who reported using surgical masks and 1 (2%) of the 46 who used the surgical mask in combination with the FFP2 (**Figure 5**).

Regarding the oral health professional's anxiety about contracting the virus, there was no statistically significant difference between the different jobs exerted in the clinical practice. The percentage of professional that reported to be worried about the virus infection was greater for OH (41.0%) in comparison with DS (30.0%, p=0.4027) and DP (18.0%, p=0.2587) (**Figure 6**). Moreover, all categories of professionals reported to be attended pacientes infected by COVID-19. However, 78.0 and 88.0% of the OH and DP professionals, respectively, reported not to be sure If the patient's test results were positive. Among the DS who had attended infected patients, only 48.0% of them did not know the patient's test result. All COVID-19 infection data response is stated in **table II**.

Discussion

The present study evaluated the prevalence of COVID 19 infection in the oral health professionals working and registered in the General Council of the Balearic Islands in Spain. Moreover, it analyzed the influence of some factors such as, age, gender, experience time, type of mask used and others in getting infected by this virus.

Table II: COVID-19 infection data response distribution.

Survey items	*Number of participants (%)*
Did you make the serology test for COVID-19?	**148 answers (100%)**
Yes, with positive result	6 (4.0%)
Yes, waiting for the results	1 (0.64%)
Yes, with negative results	58 (39.2%)
No	83 (56.1%)
Did you have any COVID-19 symptom?	**148 answers (100%)**
Yes	30 (20.3%)
No	118 (79.7%)
If you had symptoms, how much time did they last?	**148 answers (100%)**
Until 3 days	15 (50%)
4-7 days	8 (28.1%)
8-13 days	4 (12.5%)
14 days or more	3 (9.4%)
In your opinion, what is the possibility of being contaminated by the COVID-19 in your work place?	**148 answers (100%)**
There is no possibility	98 (66.2%)
Almost no possibility	11 (7.4%)
Low possibility	14 (9.5%)
Possible	8 (5.4%)
High possibility	17 (11.5%)
Did you feel fear or anxiety of contracting the virus?	**148 answers (100%)**
I am very worried	44 (29.7%)
I am worried	84 (56.8%)
I am not worried	20 (13.5%)

In this work, from the 1482 oral health professionals from the Balearic Islands who have received the survey, only 148 (10%) of them have participated by completing the questionnaire. The response rate was low, probably due to a lack of motivation amongst professionals given the harshness of the situation[9].

From the oral care professionals who answered the questionnaire, 4.05% of the respondents confirmed that they had tested positive for COVID-19. This percentage is high in comparison with a previous study, also performed in Spain, that found 1.0% of the respondents infected[9]. However, it has to be considered that the survey of the present study was electronically and voluntarily distributed, since a stratified random selection of the sample would mean a commitment from the part of the participants. Nevertheless, the voluntary character of the survey could result in biases among the participants who answered the questionnaire. One possible bias would be that professionals who were infected by the virus would be more motivated to answer the survey. Nevertheless, the results obtained are important in order to know how oral care professionals have been infected and affected by COVID-19 in the Balearic Islands, by finding out the infected professionals characteristics and propose safe guidelines and procedures for both patients and professionals[9].

Different from other studies evaluating the effect of COVID-19 in the oral care[9, 10], besides DS, OH and DP were also included in this work. This inclusion is important because it is closer to the real situation in the clinical practice where all professionals work together and encompass a larger spectrum of oral care professionals, providing more information about the conditions involved in possible infections. The resultes showed that the proportion of positive cases were not statistically significant different between the categories of workers. However, when comparing the proportions of oral care professionals that have not undergone the COVID-19 test it was found a significantly lower proportion of DS than among the rest of professionals, which could hide an under-registration of OH and DP with positive serologies. On the other hand, DS are the professional with closer contact with patients and more vulnerable to the virus[11] than the other professionals that answered the survey. Besides, the DS are the responsible for making decisions and weigh the risks versus benefits during the pandemic, mainly in the "stay-at-home" period[10], when the survey of the present study was answered.

In general, the pandemic is generating enormous psychological and social impacts and a psychological well-being is key for confronting COVID-19 and preventing mental disorders[12]. Among the different professionals categories, no differences were found regarding anxiety about contracting the virus, 56.8% of the professionals reported to be worried about the virus and 29.7% were very worried. A study performed with general participants (not specifically oral care professionals) found that only 7.0% of the individuals were very worried about being infected by COVID-19[13]. It shows a greater concern about this subject in oral care workers in comparison with other indi- viduals. These results emphasize the importance in performing studies that investigate the local situation of professionals that are more vulnerable to the virus, in order to cre- ate programs and measures to support these groups and improve their lives and work quality[12].

All infected professionals that answered the survey were from private dental practice and no contagious in the public sector were reported, probably because most professionals that answered the survey were private workers, 68.9% in their own practices and 23.0% in private clinics of other professionals. These results are in accordance with previous studies[14, 9].

An interesting fact to be observed, is that, although most professionals that answered the survey had from 10 to more than 20 years of work experience, the profes- sional with 5 to 10 years of experience presented greater prevalence of COVID-19 contagion. Also, in the sample studied here, there was no statistically significant difference in the prevalence of COVID-19 infected between the professionals that used the FFP2 mask, the surgical mask or a combination between both masks. A recent study showed that a significant number of healthcare professionals have been contaminated by the COVID-19 at their workplace due to a lack of

appropriate PPE[15]. More specifically, the surgical masks commonly used by these professionals do not ensure the required protection, mainly because of an inadequate face-seal. For this reason, FFR (FFP2 and FFP) are being recommended by the governing health administrations because of the suitable face-seal they provide[16]. However, a study showed that only 13.6% of individuals achieve an optimal face-seal when using FFR[17], due to the non-individualized, standardized character of manufacturing. Then, this fact is in accordance with the present study that showed no difference between the masks, emphasizing that an adequate face-seal is more important than the type of mask or facial respirator used.

The survey performed by the General Council of Dentists of Spain in conjunction with the Spanish Society of Oral Public Health[8] was used as a reference for the survey of the present study, with which we can reaffirm specific aspects, as well as highlight differences inherent to the insularity of our Autonomous Community and the different prevalence of infections that derive from it, in these cases only referred to DS. The Balearic Islands represent a geographical and administrative unit that can be considered a reference population against COVID-19, with characteristics that can be extrapolated to other similar communities. Due to this, it becomes necessary to differentiate this survey from those carried out in Spain as a whole, considering that other determining aspects of this pandemic must converge.

The 6 cases of positive serology for COVID-19 of the present study are located in Mallorca, where a total number of 123 professionals answered the survey. This means that the sample proportion of cases confirmed by the test in Mallorca is 4.88% and as a whole is 4.0%. According to the data reported in the National Study of Sero-Epidemiology of Infection by SARS-COV-2 in Spain, on July 6, 2020[18], the estimated prevalence of subjects with IgG antibodies against SARS-CoV-2 in all Spain is around 0.63%, while specifically in the Balearic Islands it is close to 0.21%. This finding suggest that, in the Balearic Islands, the estimated prevalence of oral health professionals with IgG antibodies against SARS-CoV-2 is higher than that of the general population.

However, further studies are necessary in order to prove this hypothesis. Nevertheless, the dissemination of the results of this survey in the appropriate media is very important in order to implement new measures in dental clinics and dental prosthesis laboratories, in the face of the next waves of infections due to COVID-19.

Conclusions

With the results of the present study was possible to find a prevalence of 4.0% of COVID-19 infection among the oral care professionals of the Balearic Islands who answered the survey. Moreover, the prevalence of infection was proportionally correlated with the most populated areas of the Balearic Islands, such as Mallorca (the greatest of the four islands) and urban and semi urban areas. There was a similarity between the professionals regarding the anxiety or fear of contracting the virus. Nevertheless, more Dentists and Stomatologists undergone the COVID-19 test than the other oral health professionals. In this study, the type of facial respirator used did not exert an effect in the virus contagion. Further studies, with a greater sample, are necessary to a better development of new clinic protocols.

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