Case Report

Impact of Covid-19 Pandemia on Knowledge and Habits during Lockdown Period in Spain

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Abstract

Objective: In April 2020, the coronavirus pandemic 2019 (COVID-19) was at its peak in Spain, what required the isolation of the population. Our study aimed at assessing the knowledge, behaviour and lifestyle during the lockdown due to COVID-19 outbreak, as well as the adaptation to COVID-19 recommendations.

Material and Methods: Questionnaires were sent *via* e-mail and completed by 777 individuals (289 men; 488 women). The Questionnaire consists of 36 simple questions according to COVID-19 clinical management guidelines developed by the Spanish Department of Health. The structure of the questionnaire is organized in sections a) demographics of the population, b) knowledge about COVID-19 symptoms; c) habits and general prevention measures against COVID-19, and d) block concerning oral hygiene habits.

Results: The response rate was 54%, with a mean age of 41 years. We found that during quarantine there was a change in habits and, if the individual belonged to a risk group, there was an increase in the frequency of hand washing ($p<0.001$), as well as in the consumption of tobacco ($p<0.001$), alcohol ($p=0.02$) and tranquilizers ($p<0.001$). During this quarantine period the interest in taking more care of the mouth was 14%, being higher if the individual belonged to a risk group ($p=0.05$). When studying the frequency of tooth brushing and comparing this action before and during the COVID-19 lockdown no differences were found ($p=0.258$).

Conclusions: Belonging to a risk group increases the interest in improving prevention, hand and oral hygiene habits and should, therefore, be extended to the rest of the population by means of health education.

Clinical Relevance: Health education programmers designed to improve knowledge about COVID-19 are helpful in promoting optimistic attitudes and maintaining safe practices.

Keywords: COVID-19; Habits; Questionnaires; Oral hygiene

Introduction

Spain has seen a sudden and disruptive outbreak of infection caused by COVID-19, thus requiring strict measures to limit its spread. Coronavirus disease 2019 is infectious in origin and caused by the SARS-CoV-2 virus. It was first detected in the Chinese city of Wuhan (province of Hubei) in December 2019, having reached more than 185 territories and countries and on the 11th March 2020, the World Health Organization (WHO) declared it as a pandemic [1-5].

This pandemic has overwhelmed health care systems and has led to dramatic preventive measures in many countries such as Spain. WHO is developing strategies in collaboration with global experts, governments and associations to rapidly expand scientific knowledge about this new virus, track its spread and virulence, and to advise countries and populations on measures to protect health and prevent the spread of this outbreak [6-10]. This is a highly transmissible virus whose main route of transmission occurs through respiratory droplets (droplet nuclei) which are produced when an infected person sneezes or coughs. Contact transmission due to contaminated surfaces or fomites is also relevant [7].

Symptoms appear from two to fourteen days later, with an average of five days after exposure to the virus. This causes flu-like symptoms, including fever, ineffective cough, and dyspnea, loss of smell, muscle pain, and fatigue. Severe cases are characterized by pneumonia, acute respiratory distress syndrome, sepsis, and septic shock leading to death. Currently, there is no specific treatment; the major therapeutic measures consist in relieving symptoms and maintaining vital functions [1,8].

Nowadays, prevention through programs involving lockdown at home, hygiene measures, social distancing and early case detection are key to lead to a considerable reduction in the number of potential cases. Changing individual and collective behaviours is crucial to flatten the contagion curve in other words, slowing down the rate of contagion so that our health systems can face the crisis [2,8]. Contagion can be prevented by frequent hand washing, or failing this, by disinfecting them with hydroalcoholic gel, by covering the mouth when coughing or sneezing, maintaining interpersonal distance between one another, as well as alternative preventive measures, such as the use of masks. This epidemic context entails changes in lifestyle, such as eating habits, physical activity, and tobacco and alcohol

consumption [2-9].

This is a situation that requires a flexible approach to learn how to acquire new knowledge and skills in the short term. At present, an atypical and stressful scenario is being faced. From the point of view of health, a picture that predicts significant changes in habits in the coming months is drawn [1-4]. Promoting and maintaining a healthy lifestyle remains a global challenge. It is essential, therefore, to investigate risky behaviors and to identify factors that influence healthy lifestyles during lockdown due to the occurrence of COVID-19 [5,6]. The purpose of this study was to assess knowledge and behaviours during the COVID-19 outbreak in Spain. In addition, lifestyle factors and their adaptation to COVID-19 recommendations were intended to be identified.

Material and Methods

The research was conducted with integrity and in accordance with ethical principles accepted and approved by the Research Ethics Committee of the University of Murcia (ID: 2850/2020). Individuals older than 18 years of age, with Spanish nationality and residence in Spain during quarantine, and cognitively capable of understanding and answering the questions were included in the study. Those who had recovered from the disease and/or had symptoms associated with COVID-19 were excluded.

A cross-sectional, descriptive and observational study was designed and the questionnaire was distributed through the 2.5.6 survey platform of the Information Technology Department of the University of Murcia. A brief introduction was initially made about background, objectives, procedures, voluntary nature of participation, anonymity and confidentiality statements and help to complete the questionnaire, and the link to complete it was provided through a URL.

Questionnaire and protocol

The sample of this study comprises population residing in Spain during COVID-19 lockdown, and the survey was conducted after one month of lockdown. Following an informed consent form, the questionnaire was designed to assess the population's knowledge and behaviour, prevention measures, and information regarding COVID-19 during quarantine.

The participants had to respond and confirm their participation voluntarily, and upon confirmation the link of the survey opened in order to complete the questionnaire. The COVID-19 survey was made up of 36 simple questions according to COVID-19 clinical management guidelines published by the Spanish Department of Health for COVID-19 [9]. The structure of the questionnaire comprised several sections a. demographics of the population, age, sex, and educational level, b. knowledge about COVID-19; c. habits and general prevention measures against COVID-19 during quarantine d. block concerning oral hygiene habits during COVID-19 period. The survey was available online for one week.

Statistical analysis. Data were analyzed using the SPSS 20.0 statistical programme (SPSS* Inc, Chicago, IL, USA). A descriptive study of each variable was conducted. The Kolmogorov-Smirnov normality test and the Levene variance homogeneity test were applied; data showed a normal distribution and were accordingly

analyzed by using parametric tests. The associations between the different qualitative variables were studied by means of Pearson's chi-square test. The associations between different quantitative variables were studied by using Student's t-test for two related samples. The Wilcoxon test was applied to assess the frequency of tooth brushing before and after one month of lockdown. Statistical significance was accepted for p≤0.05.

Results

In this study, 1436 individuals accessed the questionnaire and a total of 777 questionnaires were answered, obtaining a response rate of 54%.

Characteristics of participants

Description of the main characteristics of the sample (Table 1). The majority are women (62.8%) aged between 18 and 80 years, being the mean age 41 years (SD=15.1) and 63% of the sample have university education. With regard to COVID-19, most of the respondents do not belong to COVID-associated risk population groups (hypertension, diabetes, respiratory system condition, cancer, pregnancy) (Table 2).The majority of respondents do recognize the main symptoms, such as persistent cough, fever, sore throat, tiredness and respiratory distress caused by the virus. Regarding the recommended measures during lockdown period, 29.6% have never left home and 37.6% go out once per week, 12.2% more than once per week and 22% go out once per day. With regard to age, when comparing the groups over

Table 1: Descriptive features of the participants.

Variable	Number (n)	Percent %
Gender		
Male	289	37.2
Female	488	62.8
Educational level		
Elementary/Middle school	20	2.6
High school	100	12.9
Vocational Degree (Middle)	42	5.4
Vocational Degree (High)	87	11.2
Undergraduates (University)	493	63.4
PhD	35	4.5
Economic level		
Low	22	2.8
Medium-low	315	40.5
Medium-high	424	54.6
High	16	2.1
Occupation		
Student	178	22.9
I am still in my usual job	184	23.7
Telecommuting (work from home)	214	27.5
Normally. I not work	136	17.5
Appplicated a Temporary Employment Regulation File (TERF)*	65	8.4

Note: *Spanish labor system that allows the suspension of the employment contract. Or its temporary modification in terms of hours/workday.

Table 2. Risk factor´s of the participants.

Risk factor's	Answer. n (%)	
	Yes	No
Arterial hypertension	43 (5.5)	734 (94.5)
Diabetes	27 (3.5)	750 (96.5)
Cardiovascular disease	21 (2.7)	756 (97.3)
Respiratory system disease	23 (3)	754 (97)
Immunosuppression	20 (2.6)	757 (97.4)
Cancer	14 (1.8)	763 (98.2)
Smoker	111 (14.3)	666 (85.7)
Pregnant	6 (0.8)	771 (99.2)
Healthcare worker	117 (15.5)	640 (84.5)

60 years of age and less than or equal to 60 years of age, no significant differences were found (p=0.149) concerning leaving home during quarantine. However, in people at risk there is a tendency to stay at home (p=0.05), thus keeping lockdown measures. Regarding habits during this period, 41.4% do not feel more tired and 74.3% of those surveyed have varied their daily routines considerably. Thus, 85.1% have increased the frequency of hand washing, 42.6% have increased the consumption of tobacco and 8.6% the consumption of alcohol; 54% sleep less or stay awake at night and in 56% of individuals mood is low and 7.1% need to take an anxiolytic.

If the person belongs to a risk group, significant differences were found in terms of increased frequency of hand washing (p<0.001), tobacco consumption (p<0.001), alcohol consumption (p=0.02) and tranquilizers (p<0.001) (Table3). In analyzing by age group, those over 60 years of age have sleep problems (p=0.006) during lockdown and a lower mood (p=0.02). During this quarantine period 110 participants (14%) were interested in taking more care of their mouth and 649 (83.5%) of the respondents did not increase the habit of brushing their teeth more frequently. When conducting a comparative study, a tendency to take more care of the mouth was observed in those individuals belonging to a risk group (p=0.05).

When studying the frequency of tooth brushing during the quarantine caused by COVID-19 pandemic and making a comparison before and during this period, no statistically significant differences were found (p=0.258). Regarding oral hygiene instruments, 33.3% use a manual toothbrush, 19.3% an electric toothbrush, 42.5% fluoride toothpaste and 14.6% dental floss, and 8% complete oral hygiene by means of interproximal brushes. The group of participants aged 60 years or more shows statistically significant differences compared to the group under 60 with regard to the change of toothbrush (p=0.015) or the use of mouthwashes (p=0.02).

Most of the respondents (48.5%) had no dental problems and those with problems, these were mainly due to dental sensitivity (13%) or gingival bleeding (12.2%). Although 79.9% of the participants did not require professional dental care, they were informed about the availability of dental services for emergency treatment during quarantine.

Discussion

Spain has been unexpectedly surprised by an extremely rapid

Table 3. Differences in habits. life style during the lockdown due to COVID-19 outbreak.

Habits	Risk population groups n (%)		p-valor
	No	Yes	
Do you feel more tired?			0.312
Absolutely. not	153 (42)	169 (40.9)	
No more than usual	109 (29.9)	144 (34.9)	
Something more than usual	87 (23.9)	80 (19.4)	
Much more the usual	15 (4.1)	20 (4.8)	
Have you changed your routines?			0.964
Absolutely. not	36 (9.9)	41 (9.9)	
Yes. I have created new routines	269 (73.9)	308 (74.6)	
Yes. I no longer have routines	59 (16.2)	64 (15.5)	
Do you wash your hands?			<0.001
As before	73a (20.1)	39b (9.5)	
More than before	290a (79.9)	371b (90.5)	
Has your consumption of snacks increased?			0.886
Yes	155 (44)	176 (44.6)	
No	197 (56)	219 (55.4)	
Has your consumption of tobacco increased?			<0.001
Yes	7a (8.8)	60b (32.8)	
No	73a (91.3)	123b (67.2)	
Has your consumption of alcohol increased?			0.02
Yes	29a (12.5)	57b (21.4)	
No. the same as before	103a (44.4)	116a (43.6)	
No. less than before	100a (43.1)	93a (35)	
Has your sleep rhythm been disturbed?			0.07
I sleep more than before	106 (29.1)	92 (22.3)	
I sleep less than before	56 (15.4)	81 (19.6)	
I am unable to sleep a lot	85 (23.4)	114 (27.6)	
My dream has not modified	117 (32.1)	126 (30.5)	
Have you felt unhappy or depressed?			0.147
Absolutely. not	115 (31.6)	116 (28.1)	
No more than usual	70 (19.2)	108 (26.2)	
Something more than before	153 (42)	160 (38.7)	
Much more than before	26 (7.1)	29 (7)	
Have you needed to take a tranquilizer?			0.001
Absolutely. not	297a (81.6)	315a (76.3)	
Yes. natural infusion	45a (12.4)	38a (9.2)	
Yes. valerian	9a (2.5)	16a (3.9)	
Yes. anxiolytic	13a (3.6)	44b (10.7)	

outbreak of COVID-19, which has led to the implementation of unprecedented preventive measures that profoundly affect the entire society in all aspects of daily life [9]. An online assessment about the knowledge and perceptions of COVID-19 was conducted among the general public over a period of 7 days. The population had been adopting lockdown measures for a month and the response rate was

54%. It is important to note that the general public seemed to be well informed about the common COVID-19 risk factors and symptoms. Thus, a clear message to seek healthcare is of vital importance when experiencing some of the major COVID-19 symptoms [2-7].

This is a health crisis that has accelerated the declaration of a "State of Alarm" by the Spanish Government throughout the national territory with the aim of protecting citizens' health. Preventive measures were taken towards COVID-19, including the prohibition to leave home unless strictly necessary [1,9,12]. In this study, 67.2% did not leave home during lockdown period or did it once per week, what could be interpreted, among others, as the good knowledge of residents about the high infectivity of the COVID-19 virus.

More generally, this study underscores the need for WHO and other public health agencies to continue working with campaigns to minimize the circulation of inaccurate health information about COVID-19 [7,10]. The excess of poor-quality information without scientific support or news on social networks are a major problem [15,16]. Thus, studies by Cuan-Baltazar et al., [16] indicate the need for governments, institutions and WHO to work together to create guidelines and control mechanisms concerning the flow of information about COVID-19, as well as to establish global ethical codes in health, avoiding, therefore, mistakes and misinformation on social networks.

The findings of the present work showed that during the study period of the COVID-19 epidemic, individuals over 60 years of age had significantly different coping mechanisms, since there was an alteration in their emotional state and sleep quality. Accordingly, measures should be implemented in these age groups to face this crisis because this population group may present comorbidities and a higher risk of complications [12].

Factors such as early detection, isolation and hand washing achieve a considerable reduction in the transmissibility of the disease [1,6,7]. A considerable increase was obtained regarding the frequency of hand washing in the population of this study so, therefore, strategies to address health-related lifestyles are among the most effective and available interventions to reduce the incidence and severity of diseases. Thus, in this extremely difficult pandemic time period, healthy behaviours and lifestyles must be reinforced as the community faces an unexpected and totally new situation [7-10].

The overall impact of COVID-19 on oral health seems to be multidirectional, related to the immune system and acting through several routes, such as the invasion of the respiratory tract by coronavirus through mucous membranes [17]. The effect of complex medicinal treatment should not be underestimated when assessing the patient's oral health after intense hospitalization, and may be even more profound in the case of new experimental drugs recommended for COVID-19. SARS-CoV-2 reveals that certain neurotropic and mucotropic capabilities can potentially affect the function of the salivary glands, the senses of taste/smell and the integrity of the oral mucosa, interfering with a dynamic oral environment and additionally influencing the balance of microbial flora [11,18]. In this regard, Xu et al., [19] highlight that the virus can remain and reproduce in the epithelial cells of tongue, which thus becomes a reservoir and infection site for this disease. For this reason, there are a number of recommendations on dental and tongue cleaning, the

use of mouthwashes and other aspects of oral hygiene that should be followed by people infected with COVID-19 and that additionally can serve as measures of prevention for the general population [20].

The oral health habits of the Spanish population were analyzed in this study based on three main questions, i.e., the one related to the frequency of tooth brushing, the one related to the use of dental floss or interproximal brushes, and the question related to the use of mouthwashes. The outcomes of this study show that only 14% increase the frequency of tooth brushing during quarantine.

Accordingly, toothbrushes can become contaminated with microorganisms present in the oral cavity. The retention and survival of microorganisms in them after tooth brushing represents a possible cause of contamination of mouth. Wetzel et al., [21] have proved that the prolonged use of the same toothbrush facilitates contamination by various microorganisms. On the other hand, Peng et al., [22] indicate that the use of mouthwashes helps to reduce the load of microorganisms in mouth. For example, Izzetti et al., [23] recommend using a 1% hydrogen peroxide mouthwash or a 0.2-1 % povidone mouthwash for 1 minute. In addition, 0.05% to 0.1% cetylpyridinium chloride can help us control oral viral load, so it is useful to rinse three times per day during the active process of SARS-CoV-2 [11,22].

Dziedzic and Wojtyczka [17] indicate that people recovering from COVID-19 need additional post-acute care to recover from primary care and concomitant infection, with a recommendation for close monitoring of their oral health, particularly during the transition from hospital to other care settings and homes. The biological risk of transmission of COVID-19 by inhalation is extremely high when performing dental procedures due to the production of aerosols. Procedures must be, therefore, delayed with the exception of emergency cases [11,22,24-26].

This study uses a rapid online survey methodology, which may be a promising method for assessing and tracking knowledge and perceptions among the general public during fast-moving infectious disease outbreaks. These are questions adapted to any level of education and can be included in any health questionnaire without being uncomfortable to answer. Among the limitations, perhaps the sample bias should be indicated, since internet access in rural areas is limited and, on the other hand, older adults have poor digital skills and difficulties to answer by using this tool. More generally, this study underscores the need to continue working with information campaigns. Health education programmers designed to improve knowledge about COVID-19 are helpful in promoting optimistic attitudes and maintaining safe practices.

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