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Review Article

Review Article: Changing Habits due to the covid-19 Pandemic. An online Epidemiological Survey

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Abstract

The coronavirus Sars-Cov-2 is the cause of the pandemic declared in March 2020. Since then, countries have developed different strategies to control the spread, inducing changes in citizens daily-life. A telematic questionnaire with daily habits performed before and during the quarantine was designed, without regional or sex restriction, and minimum age of eighteen years. 1800 answers were recruited. The mean age was 41.3 ± 12.9 years, and women represented the 69.8%. More than half of the population (53%) carried out face-to-face work, 18.8% telecommuting, and 17.5% combined both methods. Shopping habits after the pandemic reduced their shopping frequency in person, beside no changes were observed in online shopping. Walking and gyms/sports centers activity was decreased in frequency. Going to bars or restaurants habit has also been reduced: "never" option was the preferred one (46.3%-54.3% respectively). Finally, friends and family meetings has also been reduced from several times a week to several times a month. A relationship between having suffered from the disease and restricting activities that suppose a greater risk has been found. Spanish population has modified behaviors since the Sars- CoV-2 pandemic onset. Activities that involve social contact have a frequency reduction.

Keywords: social habits; sars-CoV-2; spanish population; survey

Introduction

The new coronavirus Sars-Cov-2 is the cause of the pandemic declared in March 2020. Inducing a variety of atypical respiratory diseases, which present different symptoms and morbidity depending on individual genetics [1]. Among the most frequent symptoms are fever, cough, anosmia, ageusia, myalgia, and extreme fatigue [2]. In some cases, these symptoms can be severe which could cause the death of patients infected by the virus.

One of the main characteristics of the virus is its high capacity for spreading and contagion. Currently, there are more than 100 million infected people around the world and the numbers are increasing every day [3]. This contagious capacity, together with the severity of the symptoms, has forced political systems around the world to take measures to prevent the spread [4,5]. The measures that have been used are social distancing, confinement, early case detection, isolation, contact trading, and quarantine of exposed people [4]. Among them, social distancing has proven to be the most effective in preventing new infections [5,6]. The spread of the virus is reduced by up to 93.3% by maintaining these measures [7].

Although social distancing measures are effective for the pandemic, they are associated with negative consequences, including the development of mental illnesses [8,9]. Among them, the most prevalent symptoms have been anxiety, depression, and post-traumatic stress [9].

Added to health consequences, social environment aspects have been affected by the covid-19 [10]. In this sense, social life is greatly compromised.

It is known that the attitude and capacity of the planning social activities following social distancing restrictions influences the control of virus spread [11]. How people deal with restriction measures can significantly influence the pandemic development, since it is necessary to have a good attitude towards social distancing to control social mobility and to avoid the increase of infections increase [12].

For this reason, it is necessary to know the social habits of the populations and their attitude to restrictive measures, to face the third wave of the pandemic in a more effective way.

Objectives

Epidemiological study to define how the habits of the Spanish population have changed during the quarantine period caused by SARS-CoV-2.

Methods

The questionnaire is designed to include questions about daily habits performed before and during the quarantine.

The questionnaire was designed through "Google Forms". Before its completion, the participants read an information sheet (first section) where the objectives are described, and the characteristics of the study are reported.

The questionnaire consisted of five sections: "information for the participants", "demographic data", "consumption and socialization habits", "Covid-19", "Covid-19 positive" and "Covid-19 negative". All participants completed the first 4 sections and depending on their response in the fourth section, fill in the positive or negative Covid-19 section, respectively.

The first section gives relevant information to participants such as type of study, design, objective, a brief description of the questionnaire, benefits, and risks of completing it, confidentiality, and information from the research team. All participants had to check the acceptance box (informed consent) to confirm the reading and understanding, thus reflecting their voluntary participation.

Demographic data considering the date of birth (month, day, year), sex (male or female), region and province of residence, area in which they live ("rural" or "urban"), and the constitution of the family unit (section 2). Consumption and socialization habits (objective of this study) collecting information corresponding to the current work system (face-to- face, telecommuting, combined (face-to-face and telecommuting) or without work-training activity at this time. In the same way, questions were included regarding dailyhabits such as going shopping, going to the gym, or leisure centers among others, before the pandemic situation generated by Covid-19 and concerning the subsequent situation and personal adaptation to the new circumstances. This third section was made up of 7 questions: "How often do you go to the supermarket / physical store?", "How often do you buy online?", "How often do you go for a walk?", "How often do you go to the gym?", " How often do you go to bars or cafes? ", " How often do you go out to lunch / dinner? " and "How often do you meet your family and friends?" The 4 possible answers were: "Every day", "Several times a week", "Several times a month" and "Never". The following sections relate to having been diagnosed as Covid-19 positive or not ("Yes", "No", and "I don't know"). In the first case, the participant was redirected to another section where the diagnosis data (the method used, tests repetition and days elapsed between them), symptoms suffered, need for hospital admission, days of quarantine, and the possibility of home isolation was estimated.

On the other hand, if the participant had not suffered from Covid-19 or did not know it, the section to which he was directed consisted of knowing [illegible] as well as the need to have quarantined in some moment by close contact with a positive Covid-19 person and the days of this quarantine.

Almost all the questions in the questionnaire were mandatory and presented responses with several options to select or a short answer that the participant had to complete.

The questionnaire was distributed via WhatsApp and email and participation were voluntary. The inclusion criteria were present a mobile device with which to complete the questionnaire and be in full mental capacity to fill it out. No exclusions were established to age, level of education or training, or geographic location.

The recruitment of the sample was carried out in December 2020. The research team was always available for any questions that may arise during its completion through the email located in the information sheet in the first section of the questionnaire.

Statistical analysis was performed with the IBM-SPSS Statistics version 26 database. First, a descriptive analysis of the results was performed, using the mean and standard deviation as descriptors when the data were quantitative and counts and percentages in the case of qualitative variables. Qualitative variables were recorded into quantitative variables when necessary for correlational analysis. Cross tables were made to see the relationship between some variables and, when possible, correlations were made with the Pearson coefficient when the variables were quantitative, and with the Spearman coefficient when any of the variables were qualitative. A safety level of 95% was established.

Ethics Statement

All participants were informed at the beginning of the questionnaire about the purpose, procedure and outcomes of the study and must sign an informed consent to participate. This project is the first stage of a study to recruit patients to test a mobile application for Covid patients; Bioethical Committee of the University Hospital of Salamanca gave the approval with the registry number 591. Helsinki Guidelines have been followed.

Results

The study sample consisted of 1800 volunteer participants belonging to the Spanish population. The mean age was 41.3 ± 12.9 years, and women participated to a greater extent (69.8%). More than half of the population carried out face-to-face work (53%), 18.8% telecommuting, and 17.5% combined both methods (Table 1).

		Patients (n= 268)
Age (years)		41.2 ± 12.9[a]
Age groups	Under 40 years	45.9%
	Between 40 and 65 years	51.3%
	Over 65 years	2.8%
Gender	Female	72.2%
	Male	27.8%
Live area	Rural	15.4%
	Urban	84.6%
Family unit (number)		2.9 ± 1.2[a]
Job modality	Face-to-face	55.4%
	Telecommuting	13.2%
	Combination	18.1%
	Neither study nor work	13.3%

Table 1: Descriptive data of total sample

The most representative percentage of the sample belonged to the Autonomous Community of Castilla y León (31.9%), mainly from the province of Salamanca (20.3%). The next most represented Community was Madrid (20.5%), and the rest of the sample belonged to the rest of the Spanish territories (Figure 1). An 81.8% of the sample belonged to the urban area and lived in an environment with an average number of cohabitants of 2.9 ± 1.2 people (Table 1).

Figure 1: *Sample distribution by region*

14.4% of the sample suffered Covid-19 in recent months, and of them, only 9.3% had to be hospitalized. The most used detection system was PCR (55.6%) followed by serology (43.3%). The tests were repeated to check the evolution in 53.7% of the patients, with a mean duration between tests of 19.6 ± 28.2 days. Most of the people who had Covid-19, had to quarantine for 20 days or more (67.9%). The highest percentage of them were able to stay away from their partners or did not need it (73.2%). Within the group of participants who did not suffer from Covid-19, 40.5% of them underwent a PCR and 30.5% a serological analysis to confirm the result. Of them, 14.4% had to quarantine, in most cases for 10 days (55.9%). Few cases exceeded 20 days (4.7%) (Table 2).

			Patients (n=286)
POSITIVE COVID	**Diagnostic Method**	PCR	80.1%
		Antigen (nasopharyngeal)	17.5%
		Antigen (capillary blood)	24.2%
		Serology	29.9%
	Retest	Yes	53.7%
		No	46.3%
	Time between test (days)		19.59±28.16
	Symptom's duration (days)		50.8±81.6
	Hospital admission	Yes	9.3%
		No	90.7%
	Quarantine days	10 days	22.8%
		Between 10 and 20 days	32.1%
		20 days	9.3%
		Over 20 days	35.8%
NEGATIVE COVID	**Diagnostic method**	PCR	40.5%
		Antigen (nasopharyngeal)	13.8%
		Antigen (capillary blood)	21.8%
		Serology	30.5%
	Close contact quarantine	Yes	11.8%
		No	88.2%
	Quarantine days	Not applicable	88.4%
		10 days	6.3%
		Between 10 and 20 days	4.5%
		20 days	0.3%
		Over 20 days	0.5%

Table 2: *Covid-19 characteristics*

Regarding habits before the pandemic, most of the sample used to shop in person several times a week (55%) and shopping-online several times a month (58%). Regarding their physical activity, the participants mostly walked every day or several times a week (67.7%), while a high percentage never went to the gym (47.8%). They carried out leisure activities in bars and restaurants generally several times a month (44.7% and 63.4% respectively), followed by those who attended several times a week (39.3% and 44.8% respectively). Finally, regarding the frequency they visited friends and family, the highest proportion was several times a week (47.8%).

Changes in lifestyle habits were evidenced after the pandemic. People who shop in person reduced their frequency, being now more predominant to go several times a month. In the online purchase, no changes were observed. Among those who went out for a walk, the number who did it

weekly decreased, and the percentage of those who walked several times a month increased. In the habit of going to gyms or sports centers, the frequency of the habit also decreased, increasing the number of people who never attended, and now 71.1% of the sample does not have this habit. The frequency of going to bars or restaurants has also been reduced, now, the option "never" is the preferred one (46.3% and 54.3% respectively). Finally, the frequency with which participants see friends and family has also been reduced, going from several times a week to several times a month (Table 3).

HABITS		Before the pandemic	Nowadays
Face-to-face shopping	**Never**	1.6%	5.8%
	Sometimes a month	33.6%	60.2%
	Several times a week	56.8%	31.7%
	Everyday	8%	2.3%
Online shopping	**Never**	27.7%	14.6%
	Sometimes a month	59.9%	59.4%
	Several times a week	12%	25.3%
	Everyday	0.3%	0.7%
Walk	**Never**	7.2%	10.9%
	Sometimes a month	22.8%	28.3%
	Several times a week	36.1%	38.7%
	Everyday	33.9%	22.1%
Go to the gym	**Never**	49.4%	73.6%
	Sometimes a month	11.1%	8.7%
	Several times a week	34.1%	15.7%
	Everyday	5.4%	2.1%
Go to pubs	**Never**	4.7%	47.9%
	Sometimes a month	46.2%	37.9%
	Several times a week	40.6%	13.1%
	Everyday	8.5%	1.1%
Go to restaurants	**Never**	7.6%	56.1%
	Sometimes a month	65.6%	35.1%
	Several times a week	25.6%	8.6%
	Everyday	1.2%	0.2%
Relatives' visits	**Never**	1.2%	26.9%
	Sometimes a month	40.2%	57.7%
	Several times a week	49.4%	14.2%
	Everyday	9.2%	1.2%

Table 3: *Sample Daily living habits.*

Significant correlations were found between symptoms time and changing habits; since the people who had had symptoms of the disease for a longer time presented a higher change in the frequency with which they went shopping, to bars, restaurants, and to see their relatives.

People who had a lower frequency of going to bars, restaurants and seeing family members had a better attitude towards new confinement, and this relationship was significant.

Finally, a correlation between the people who made a broad change in their shopping habits (in person and online) and walking was found. as well as a better attitude to new confinement (Table 4).

DAILY LIVING HABITS	Symptom's duration	Attitude to a new lockdown
Face-to-face shopping (nowadays)	-0.016	0.032
Online shopping (nowadays)	-0.100	-0.034
Walk (nowadays)	0.076	0.017
Go to the gym (nowadays)	0.122	0.037
Go to pubs (nowadays)	0.083	0.084**
Go to restaurants (nowadays)	0.169**	0.056*
Visit relatives (nowadays)	0.105	0.076**
Change of face-to-face shopping habits	0.141*	0.055*
Change of online shopping habits	-0.018	-0.047*
Change of walking habits	0.114	0.053*
Change of habits in going to the gym	0.102	0.000
Change of habits in going to pubs	0.124*	0.001
Change of habits in going to restaurants	0.204**	0.030
Change of habits in visiting relatives	0.185*	0.025

Table 4: Correlation of daily living habits with symptom's duration and attitude to a new lockdown

Discussion

Our study shows the relationship between different social behaviors of Spanish population and how they have changed due to the pandemic situation.

The study was designed with the online survey format, which is considered the ideal means to access the general population and achieve a larger sample size (balance) without any risk. The sample of our study belonged to the different Spain regions, which allows representativeness of the territory, as well as to compensate for the differences that may exist

between them. Also, the sample size was higher than other studies reviewed, which allows increasing the degree of generalization of the results [13, 15].

In addition to trying to collect habits before the pandemic, our study has tried to go further, analyzing how they have been modified by different social restrictions and social distancing policies [16,17]. This has made it possible to demonstrate a reduction in the frequency with which the Spanish population performs the different activities that involve social contact. Of the habits examined, it was found that all those that involve leaving the home were conditioned by the pandemic, while online purchases, without personal contact, did not change.

The Spanish population has reduced all behaviors that involve certain social contact, as well as others that are more related to healthy lifestyle habits, such as physical exercise. This corresponds to other studies that have studied these habits [18,19].

It was also analyzed how the disease affected the Spanish population, and how the measures derived from the process have affected their daily life. The measure that is the most effective in restricting the spread of the virus and the transmission of the disease is home confinement [20]. However, as some authors point out, these confinements have negative psychological and affective consequences [21,22]. This could lead to a worse attitude towards new confinement; however, our study does not show a direct relationship in this sense.

Studies suggest that testing should be done 24 hours apart to optimize management and keep the number of exposures to a minimum [7]. Despite this, it does not seem to be a reality, the times obtained in our study are much longer, the average time exceeding two weeks, which may be significantly reducing the effectiveness of the monitoring of active cases. On the other hand, longer periods of quarantine could be beneficial in order to avoid transmission, as other studies highlight the importance of timing of testing, duration of quarantine to minimize economic impacts, disruptions to operational integrity, and COVID-related public health risks [23].

Conclusion

The Spanish population has modified its behavior since the beginning of the pandemic produced by Sars-CoV-2. They have reduced the frequency with which they carry out activities that involve social contact. Besides, a relationship has been found between having suffered from the disease and restricting activities that suppose a greater risk.

Regarding the affectation, it was observed that the elderly was more affected by the disease and were the ones who presented the longest time of symptoms and confinement. This corresponds to what has been observed in multiple studies, which show that those over 65 years of age are more vulnerable to the disease [24-26]. They were also the group with the greatest behavior change, as shown by Muto et al. [27]. This is related to the result obtained in terms of their expectations before new confinement. The fact of having spent more time at home and having reduced their frequency in social habits has not contributed to generating fear of isolation, but rather seems to improve their attitude and their security sense.

As expected, people with a face-to-face job had a higher incidence of cases. Exposure to the virus is greater in these people and therefore can influence the prevalence of the disease in this group, as pointed out by some authors [28].

Affected people in the Spanish population showed a greater change in the frequency with which they went to bars, in contrast to what was observed in those who had not suffered from the disease. In our opinion, this may be due to the expectation of greater insecurity in this area. These behaviors have not yet been explored in the literature, so they are considered an aspect that should be more widely studied in the future.

In the same way, those who presented symptoms for the longest time were the ones who changed their habits the most, especially those who required more direct social contact, like going to bars, restaurants, shops, or visits to relatives. Some authors explored some of these aspects, and our study shows results like those reported in their works [29-30].

Finally, it should be noted that the attitude presented by the participants to new confinement was better in those who presented a more infrequent social behavior and in those who had a greater change in it. This may be a bidirectional aspect, but we consider it advisable to increase research in this field to understand the causes of this phenomenon.

Conflicts of interest: The authors report no conflict of interest.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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