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ORIGINAL ARTICLE

Use of preventive measures, beliefs and information received about COVID-19 and their effects on mental health, in two stages of the pandemic in Colombia

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ABSTRACT

Background: Several studies have highlighted the effects of the COVID-19 pandemic on both physical and mental health. The aim of this study is to analyse the effects on mental health in two phases of the COVID-19 pandemic (April 2020 and February 2021) in the population of Colombia.

Methods: Observational, prospective, cross-sectional study along two periods, April 2020 and February 2021. The sample ($N = 1309$) was extracted from the Colombian population, only including individuals over the age of 18 and residing in Colombia during the pandemic. The IMPACTCOVID-19 questionnaire was used, previously validated in Spain and cross-culturally adapted to the Colombian population, which included sociodemographic data, use of preventive measures, information received and the Goldberg General Health Questionnaire (GHQ-12) for psychological distress (PD). Participants had to sign an informed consent before taking part in the investigation.

Results: A higher level of PD was observed among women ($M = 3.99$, SD = 3.39) ($p < .001$), in those who lived without a partner ($M = 3.83$, SD = 3.47) ($p = .036$), and in those with a worse perception of health ($M = 6.27$, SD = 3.51) ($p < .001$). PD decreased in the second period from $M = 3.99$ (SD = 3.36) to $M = 2.98$ (SD = 3.30) ($p < .001$), coinciding with a higher use of preventive measures, less distress caused by COVID-19 and greater confidence in healthcare professionals and clinical structures. In the second period, the time spent in getting informed decreased, but the sources of information were the same, principally social media and official sources.

Conclusions: Better information on the effects and preventive measures to prevent the pandemic improves confidence in the health system and its professionals, reducing the level of PD. There is a need for quality information on social networks and an adaptation of telemedicine to address the pandemic effects on mental health.

KEY MESSAGES

- Psychological distress (PD) decreased in February 2021, as compared to April 2020, due to a greater use of preventive measures against COVID-19, and the confidence on the recommendations made by health officials and professionals.
- Higher PD has been found in women and people who lived without a partner, in line with studies performed in other countries.
- The accessibility to quality information on the pandemic should be promoted by the Official Health Authorities, thus counteracting data that could be classified as "fake news".

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Psychological distress; COVID-19; mental health; knowledge; information; preventive measures; social media

1. Introduction

The World Health Organization (WHO) declared an international pandemic due to COVID-19 on 12 March 2020 [1], a disease that had its beginnings in late 2019 in the city of Wuhan [2]. There is evidence that it arrived in Brazil at the end of February 2020 and a few days later in Colombia, with 702 cases being counted in this date, 6.6% of the quantitative real-time

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PCR method (rRT-PCR) tests performed, in 22 of the 32 existing departments [3]. The Ministry of Health and Social Protection of Colombia declared a state of health emergency in March 2020 to control the spread of the disease [4] and subsequent measures to prevent its health effects [5]. By 6 March 2021, 1 year after the first detected case, a total of 2,273,245 cases and 60,412 deaths from COVID-19 had been confirmed, 79% of whom were over 60 years of age, with a higher percentage of men (63.6%) [6]. In fact, the incidence of cases in Colombia was higher in 2021 than in 2020. In 2021, the number of cases per week overpassed 100,000 every week, registering a maximum of 209.284 cases in the week 26 of 2021 [7].

In July 2020, the Pan American Health Organization recommended the need to reduce the infection curve in order to reactivate the economies of Latin American countries, as well as to establish social protection measures to protect the most vulnerable groups [8]. Colombia is one of the countries with the highest levels of inequalities in health care [9], and an association between the indicators of low social capital and psychological distress (PD) has been observed [10]. In previous epidemics, the influence of these scenarios has been observed not only on physical health but also on mental health [11]. In the present case, effects on levels of stress, anxiety and depression were found from the beginning of the pandemic [12,13], and an increase in PD was observed, especially in certain vulnerable groups such as young people, older people, women and migrant workers [14].

Although there have been many studies on the association between mental health and COVID-19, few included data on mental health prior to the pandemic, so it is difficult to know what the effects were [15]. It is known that there are many factors in a pandemic that can play a role in PD. These include confinement measures, social isolation [16] or lack of adequate information to justify community isolation measures [17]. Also, there is still considerable uncertainty about differences in the effects on population subgroups. Previous studies have found higher PD among women [18], but not with respect to age. Furthermore, while some studies identified higher PD among older people [19], in others it was detected in those under 31 years of age [18]. For this reason, it is useful to know what the effects of this pandemic have been on the Colombian population and the variables that may have had a greater influence on mental health.

Several studies have analysed the level of public knowledge about the pandemic [20], as well as attitudes and the use of preventive measures against COVID-19 [21], and have identified the need to improve quality and accurate information on the internet to reduce the level of PD [22]. Previously, it has been documented that COVID-19 causes PD in the Colombian population [23] and, specifically, in the context of its healthcare workers [24]. According to a recent study, news topics are starting to discuss the mental health and emotional impact of COVID-19, indicating how to communicate this event to the youngest, and the changes that could happen in people's relationships. However, it is necessary to indicate the population's common visualization of "expert collaborators", various professionals who discuss from the point of view of care, access to mental health services, and daily lifestyle. This could be seen in countries like Germany, UK, Spain and Colombia [25].

The COVID-19 pandemic has spread globally but, as shown above, its effects on the physical and mental health of the population have not been the same in all countries, nor in all groups, influenced by access to public health resources or by socio-economic and cultural health determinants [9]. The aim of this study was to analyse the effects of COVID-19 on mental health, expressed in PD levels, during two different phases of the pandemic, April 2020 and February 2021. The use of media and the quality of the information has also been investigated. The data of this investigation could allow for the creation of public health strategies for the population in Colombia, mainly focussed on the education about the disease, common beliefs and preventive measures, as well as, where to find trustable information sources.

2. Materials and methods

2.1. Design type and sample

Descriptive prospective study.

2.2. Participants

The population in Colombia exceeds 50 million people, and 35 million over the age of 18, the age at which they were eligible to participate in the study. A sample size of 1495 was estimated with 2.75% of precision, 95% confidence level and adjustment for losses of 15%. The number of questionnaires analysed was 1309, after eliminating 186 questionnaires (12.5%) due to non-response of some of the questions (a 99% of responses was required for a complete questionnaire). They were collected in two periods, the first during the month of April 2020 and a second period during the month of February 2021. Inclusion criteria were

being 18 years of age or older, residing in Colombia during the pandemic, and the acceptance of the informed consent. Questionnaires were encouraged to be received from both sexes, most of the 32 Departments of Colombia, with no distinctions of whether the individuals were working or not. A wide range of occupations was expected.

2.3. Instruments

The IMPACTCOVID-19-Colombia questionnaire was used for the study. The original IMPACTCOVID-19-Spain questionnaire, in Spanish language, had been validated in a previous study conducted in Spain [26], which in turn had included previously validated instruments, such as the Goldberg General Health Questionnaire (GHQ-12) [27], a cross-culturally adapted and validated questionnaire of knowledge about COVID-19 [28], and another questionnaire covering the knowledge on the most common preventive measures and symptoms of the pandemic that was created ad-hoc and validated [26], based on a previous publication [28] and recommendations by the WHO [29].

The IMPACTCOVID-19-Colombia questionnaire was designed by an international university and professional research team. The pilot version of the questionnaire was assessed by a panel of experts (epidemiologists, doctors, psychologists and public health consultants), considering differences in sex, educational level, age, geographical location, profession and restrictions of the first phase of the pandemic. Subsequently, despite being in Spanish language, it was culturally and idiomatically adapted to the Colombian population to ensure that there were no comprehension problems in the questions. After that, a pilot study was conducted in Colombia, showing a Cronbach's alpha = 0.86.

The IMPACTCOVID-19-Colombia questionnaire included socio-demographic data: age, sex, educational level, people with whom they live, whether they have children, place of residence (by Departments), whether the dwelling had an outdoor location (balcony or garden), type of occupation, differentiating especially between healthcare professionals and non-healthcare professionals, and health perception in five levels, from optimal to lousy.

The general psychological status was assessed using the GHQ-12 with appropriate permissions [27], which consists of 12 items with four response options, giving 0 points to the first couple of questions and 1 point to the final two, with a total score that ranges from 0 to 12. The cut-off point established for the general population was three, considering the presence of PD in those with scores greater than or equal to 3. (Cronbach's alpha = 0.880).

Preventive measures were assessed using a questionnaire based on the WHO recommendations [28,29], validated in Spain [26] and cross-culturally adapted to the Colombian population. It had five response options, with respect to the frequency with which they were performed: covering the mouth for sternutation; reluctance to share personal utensils (i.e. spoon); handwashing with soap and water; handwashing with hydroalcoholic solution; handwashing after touching the nose or sneezing; handwashing after touching possibly contaminated objects; wearing a mask despite not having symptoms; and leaving at least 1.5 m of distance from people. The answers were categorized from never to always in five-item scale.

The participants were asked about the presence of the most associated symptoms with the COVID during the past 2 weeks. These were fever (at least one day being 38 °C or higher), cough, myalgia, muscle pain, vertigo, diarrhoea, sore throat, rhinitis, chills and breathing difficulties [28,29].

Questions were asked about the level of knowledge COVID-19 [28]: possibility of getting or transmitting the disease; health effects after the infection; difficulty of treatment; and concern about the disease. Scores ranged from 1 to 10.

The participants were also asked about the type of source used to get information about COVID-19: social media (WhatsApp, Facebook, Instagram, etc.), radio, Google or other internet search engines, websites of official bodies or scientific societies, official phone numbers and information apps, television, newspapers (online or print), friends or relatives and others. Participants also needed to answer about the number of hours spent consulting these sources, the degree of veracity they gave them, and whether they checked them. They were also asked about the topics on which they searched and whether they believed they had enough information: symptoms, treatment, transmission routes, COVID-19 preventive measures, and whether the information provided by their company was clear and accurate. These had a response range of 1–10.

2.4. Procedure

Sampling was done using a non-probability sampling methodology, snowballing method, the same methodology chosen for the European study on Living, Working, and COVID-19 by Eurofound [30].

The Qualtrics® storage and survey platform was used to collect data through an online questionnaire. This questionnaire was publicly available and free to use and therefore no permissions were required. The link to it was sent to the email lists of the professional groups that were invited to participate, and they were asked to disseminate the questionnaire among their colleagues in order to trigger a snowball effect. Scientific societies and universities were involved in the dissemination for open public and other professional groups. Participants completed the survey from different electronic devices (tablet, personal computer and mobile phone) with internet access. This same procedure was carried out in both periods of the investigation.

2.5. Data analysis

Absolute frequencies and percentages were calculated for the variables of interest. Measures of central tendency and dispersion were presented considering the totality and differentiating the two study periods. Student's T-test was carried out in order to detect the existence of statistically significant differences between periods under assumption of normal distribution. The chi-squared test was used to show whether the use of media or platforms from which information was received changed. And 95% confidence intervals for PD were plotted for different modes of the socio--demographic variables and taking into account the two study periods. Radial plots allowed detecting the different behaviours of the population with respect to the variables related to preventive measures and the population's beliefs about COVID-19.

All analyses were carried out using the SPSS version 26.0 statistical software (IBM, Armonk, NY) and Excel (Microsoft, Redmond, WA).

2.6. Ethical principles

The ethical principles set out in the Declaration of Helsinki were followed. Permission was obtained from the participants by means of an informed consent, prior to the start of the questionnaire, in which they expressed their voluntary desire to participate in the study. Data were recorded anonymously and treated confidentially. The study has been authorized by the Ethics Committee of the *Universidad de Cartagena* in Colombia (Acta N° 133-14-04-2020) and in Spain by the Research Ethics Committee of Huelva, belonging to the Andalusian Regional Ministry of Health (PI 036/20).

3. Results

3.1. Sociodemographic data

A total of 904 questionnaires were collected from the first study period (April 2020) and 405 questionnaires from the second period (February 2021). The questionnaires came from 27 of the 32 Departments of Colombia, with higher percentages from Bolivar, Bogotá and Casanare. About 58.52% were women, 50.34% were 31 years old or younger, 61.50% had no partner, 60.89% had a university education, 69.52% lived in a house with outdoor space and 56.30% had no children. The sample included active labourers, unemployed, retired and students. In 2020, a 62.7% of the population was working actively, though in 2021, only a 25% was working and the number of students increased (52.5%). Questionnaires were obtained from 30 of the 44 occupations in the used classification, with the majority being teaching professionals (15.1%) and healthcare professionals (27.5%).

3.2. Psychological distress related to demographic variables and pandemic phase

In the sample as a whole, PD (GHQ-12) was higher in women ($M = 3.99$, SD = 3.39) than in men ($M = 3.24$, SD = 3.28) $p < .001$; in people living without a partner ($M = 3.83$, SD = 3.47) than in those living with a partner ($M = 3.44$, SD = 3.19) $p = .036$; and in those with a worse perception of health ($M = 6.27$, SD = 3.51) than in those with an optimal perception of health ($M = 3.38$, SD = 3.22) $p < .001$. The difference is not statistically significant among those who are younger (31 years old or younger), have university education or higher, live in a house without outdoor space (balcony or villa), or do not have children. There was also no difference between being working or not, nor between healthcare professionals and non-healthcare professionals (Table 1).

Comparing the questionnaires received in the first phase of the pandemic (April 2020) and a second phase (February 2021), the level of PD decreased in the second phase in all groups (Table 1 and Figure 1).

3.3. Psychological distress in the two pandemic phases by COVID-19

The overall PD score (GHQ-12) is $M = 3.68$ (SD: 3.37). When comparing between the two pandemic time periods, PD had decreased in the second time period, from GHQ-12 $M = 3.99$ (SD = 3.36) to $M = 2.98$ (SD = 3.30) $p < .001$. With Cronbach's Alpha = 0.873 (April

Table 1. Sociodemographic data and psychological distress in the two study periods.

			Student's T-test		April 2020	February 2021	April 2020	February 2021	Student's T-test	
	N (%)	GHQ-12 M (SD)	Statistical	*p*	N (%)	N (%)	GHQ-12 M (SD)	GHQ-12 M (SD)	Statistical	*p*
Total	1309	3.68 (3.37)			904	405	3.99 (3.36)	2.98 (3.29)	5.083	<.001
Sex										
Male	543 (41.48)	3.24 (3.28)	−4.008	<.001	355 (39.27)	188 (46.42)	3.44 (3.24)	2.86 (3.32)	1.974	.049
Female	766 (58.52)	3.99 (3.39)			549 (60.73)	217 (53.58)	4.35 (3.38)	3.08 (3.27)	4.781	<.001
Age (grouped by means)	*N* = 1307				*N* = 902					
31 or les	658 (50.34)	3.84 (3.42)	1.792	.073	336 (37.25)	322 (79.51)	4.47 (3.42)	3.18 (3.29)	4.918	<.001
More than 31	649 (49.66)	3.51 (3.30)			566 (62.75)	83 (20.49)	3.70 (3.28)	2.19 (3.16)	3.917	<.001
Marital status										
Without a partner	805 (61.50)	3.83 (3.47)	2.098	.036	480 (53.10)	325 (80.25)	4.30 (3.49)	3.13 (3.32)	4.776	<.001
With a partner	504 (38.50)	3.44 (3.19)			424 (46.90)	80 (19.75)	3.64 (3.16)	2.36 (3.11)	3.316	.001
Educational level										
Upper secondary school or lower	512 (39.11)	3.57 (3.41)	−0.913	.361	217 (24.00)	295 (72.84)	4.26 (3.51)	3.07 (3.25)	3.953	<.001
University or higher	797 (60.89)	3.75 (3.34)			687 (76.00)	110 (27.16)	3.91 (3.30)	2.74 (3.40)	3.439	.001
Dwelling										
Flat/house with outdoor space	910 (69.52)	3.57 (3.34)	−1.753	.080	604 (66.81)	306 (75.56)	3.91 (3.32)	2.90 (3.28)	4.376	<.001
Flat/house without outdoor space and others (hotel, care home, …)	399 (30.48)	3.92 (3.41)			300 (33.19)	99 (24.44)	4.15 (3.41)	3.23 (3.33)	2.338	.020
Children										
Yes	572 (43.70)	3.49 (3.24)	−1.820	.068	481 (53.21)	91 (22.47)	3.76 (3.21)	2.05 (3.01)	4.682	<.001
No	737 (56.30)	3.83 (3.46)			423 (46.79)	314 (77.53)	4.26 (3.49)	3.25 (3.32)	3.966	<.001
Self-perceived health										
Mediocre or lousy	137 (10.47)	6.27 (3.51)	9.858	<.001	99 (10.95)	38 (9.38)	6.40 (3.23)	5.92 (4.14)	.640	.483
Optimal	1172 (89.53)	3.38 (3.22)			805 (89.05)	367 (90.62)	3.70 (3.25)	2.67 (3.03)	5.229	<.001
Healthcare professional										
Yes	360 (27.50)	3.59 (3.34)	−0.555	.579	296 (32.74)	64 (15.80)	3.9 (3.3)	2.4 (3.4)	3.181	.002
No	949 (72.50)	3.71 (3.38)			608 (67.26)	341 (84.20)	4.1 (3.4)	3.1 (3.3)	4.302	<.001

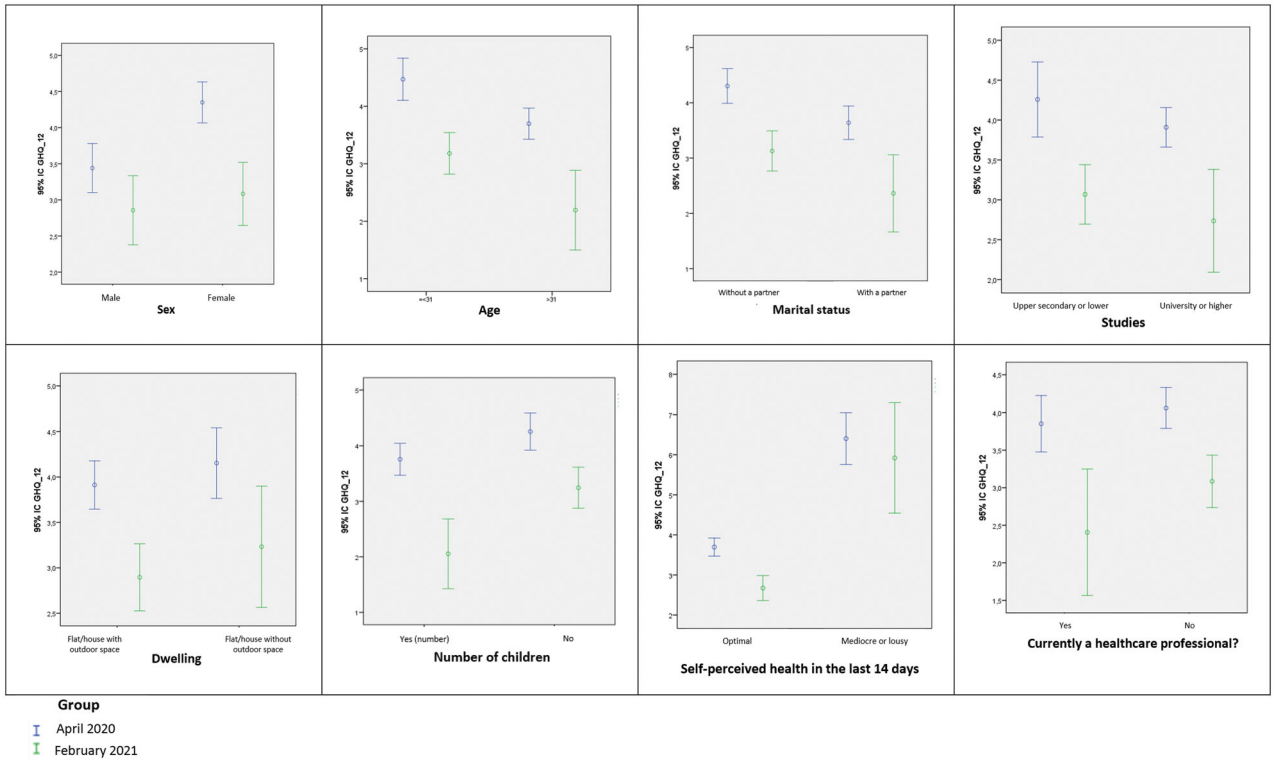


Figure 1. Psychological distress and sociodemographic variables in the two study periods.

Table 2. Psychological distress related to the use of preventive measures and the beliefs about COVID-19 in the two study periods.

	$N = 1309$		April 2020 ($n = 904$)		February 2021 ($n = 405$)		Student's T-test	
	M	SD	M	SD	M	SD	Statistical	*p*
GHQ-12 (Range 0–12)	3.68	3.37	3.99	3.36	2.98	3.30	5.083	<.001
SYMPTOMS	1.32	1.47	1.51	1.53	.90	1.23	7.654	<.001
Preventive measures (Range 1–5)								
1. Covering mouth	4.26	0.94	4.22	0.97	4.34	0.88	−2.059	.040
2. Avoiding sharing utensils	4.13	1.25	4.00	1.33	4.42	0.99	−6.290	<.001
3. Washing hands with soap and water	4.70	0.55	4.71	0.55	4.67	0.57	1.062	.288
4. Washing hands with hydroalcoholic solution	4.12	1.04	3.94	1.09	4.51	0.78	−10.656	<.001
5. Washing hands immediately after coughing, touching the nose, or sneezing	4.00	1.03	3.97	1.06	4.06	0.98	−1.349	.178
6. Washing hands after touching potentially contaminated objects	4.59	0.727	4.58	0.75	4.61	0.69	−0.803	.422
7. Wearing a mask regardless of the presence of symptoms	4.21	1.16	3.94	1.27	4.80	0.53	−17.354	<.001
8. Leaving at least 1,5 metres of distance	4.29	0.82	4.31	.83	4.25	0.79	1.264	.207
COVID-19 Beliefs (Range 1–10)								
1. Fear about COVID-19	8.22	1.97	8.45	1.91	7.70	2.00	6.449	<.001
2. Survival possibilities after an infection	7.97	2.02	7.85	2.11	8.25	1.80	−3.536	<.001
3. Trust in the ability if healthcare professionals for diagnosis and treatment.	7.59	2.2	7.16	2.30	8.57	1.57	−12.919	<.001
4. Trust in the ability if health system for diagnosis and treatment	5.84	2.58	5.24	2.51	7.20	2.19	−14.318	<.001
5. Probability of becoming infected	5.56	2.61	5.47	2.66	5.77	2.48	−1.925	.054
6. Physical effects after having COVID-19	6.92	2.63	7.25	2.57	6.18	2.62	6.919	<.001
7. Difficulties in treating the disease	6.93	2.22	7.10	2.27	6.56	2.05	4.296	<.001
8. Worry about being infected.	7.84	2.41	7.99	2.41	7.51	2.37	3.371	.001
9. Apprehension about being transmitter of the virus to other people	9.02	1.90	8.97	2.02	9.15	1.62	−1.779	.076

- Questioned about the following symptoms: fever (at least one day being 38 °C or higher), cough, myalgia, muscle pain, dizziness, diarrhoea, sore throat, coryza, chills and breathing difficulties.
- Likert-type from 1 (Never) to 5 (Always) response scale on preventive measures.
- Score range on Beliefs about COVID-19 from 1 to 10.

2020) and Cronbach's Alpha = 0.895 (February 2021) (Table 2).

3.4. Use of preventive measures and beliefs against COVID-19 in the two pandemic phases

Overall, as shown in Table 2, the preventive measures with the highest scores were: handwashing with soap and water $M = 4.70$ (SD: 0.55), and handwashing after a contact with potentially contaminated things $M = 4.59$ (SD: 0.727). On the other hand, those with the lowest scores were handwashing immediately after coughing, touching nose, or sneezing $M = 4$ (SD: 1.03); the use hydroalcoholic solution $M = 4.12$ (SD: 1.04), and avoiding sharing utensils $M = 4.13$ (SD: 1.25).

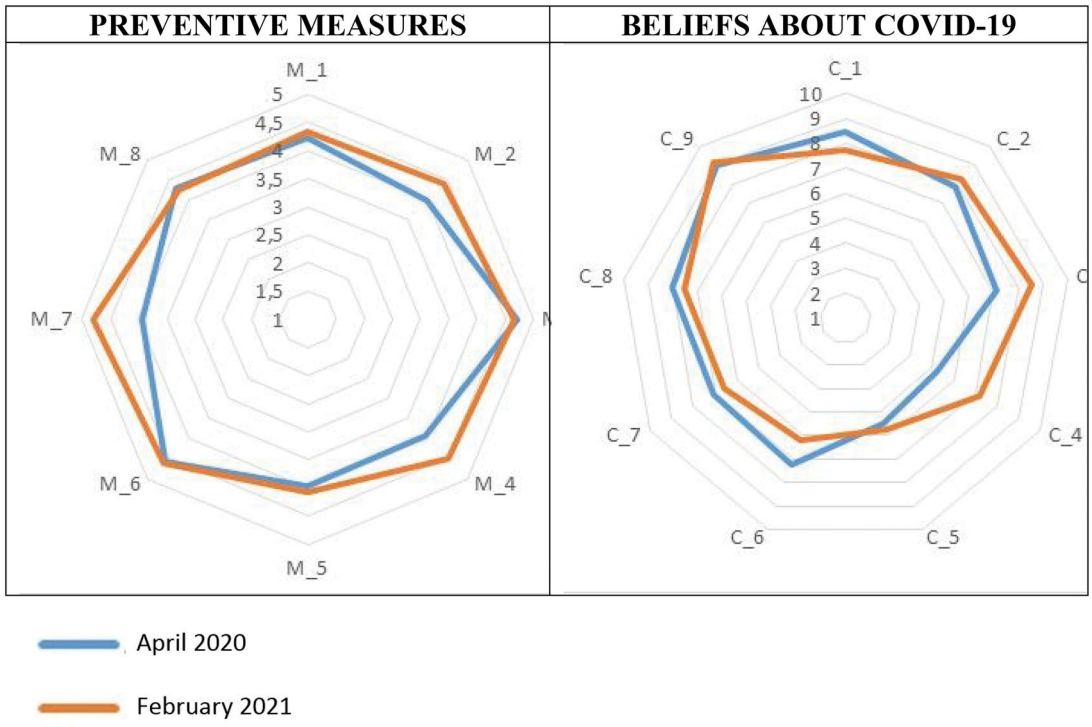
When comparing the two periods of the pandemic (April 2020 and February 2021), it can be seen that the application of preventive measures has increased in the second period in: covering mouth to cough, not sharing personal utensils, handwashing with hydroalcoholic solution and wearing a mask regardless of the context (Table 2 and Figure 2).

With regard to beliefs about COVID-19, after analysing all the questionnaires, the level of concern about being a transmitter of the virus to other people had the greatest concern, with a value of 9.02 out of 10 (SD: 1.90). The lowest values were found for the perceived risk of getting infected with COVID-19, 5.56 out of 10 (SD: 2.61), and the general trust in the health system to diagnose or recognize the disease, 5.84 out of 10 (SD: 2.58) (Table 2).

Observing the data from the questionnaires of the first and second period, an improvement is noted in the assessment of the second phase (February 2021) in most of the beliefs; the levels of distress were reduced in variables concerning co-existence with COVID-19 and the pandemic ($M = 8.45$ *vs.* 7.70; $p = < .001$), the health effects after the infection ($M = 7.25$ *vs.* 6.18; $p = < .001$), the difficulty of treatment ($M = 7.10$ *vs.* 6.56; $p = < .001$), and the degree of nervousness ($M = 7.99$ *vs.* 7.51; $p = .001$). In contrary, there was a higher confidence about the probability of surviving after an infection ($M = 7.85$ *vs.* 8.25; $p = < .001$), and the ability of healthcare professionals ($M = 7.16$ *vs.* 8.57; $p = < .001$) and health systems ($M = 5.24$ *vs.* 7.20; $p = < .001$) to diagnose or recognize the disease (Table 2 and Figure 2).

3.5. Number of sources and time spent on learning about the pandemic

The mean number of sources used for information was $M = 3.87$ (SD: 2.06), with a mean of 4.49 h per day of consultation (SD: 3.56). The most searched topics were on preventive measures ($M = 8.47$; SD = 1.96) and on transmission routes ($M = 8.15$; SD = 2.15).



M_1: Covering mouth; M_2: Avoiding sharing utensils; M_3: Washing hands with soap and water; M_4: Washing hands with hydroalcoholic solution; M_5 Washing hands immediately after coughing, touching the nose, or sneezing; M_6: Washing hands after touching potentially contaminated objects; M_7: Wearing a mask regardless of the presence of symptoms; M_8: Leaving at least a metre and a half distance
C_1: Concern about COVID-19; C_2: Probability of surviving COVID-19 if infected or gets infected; C_3: Confidence in the capacity of healthcare professionals to diagnose or recognise COVID-19; C_4: Confidence in the health system to diagnose or recognise COVID-19; C_5: Risk of getting infected with COVID-19; C_6: Health effects after the infection; C_7: Difficulty of treatment; C_8: Degree of concern about the infection; C_9: Degree of concern about being transmitter and transmitting the virus to relatives, close persons, or patients

Figure 2. Preventive measures and beliefs about COVID-19 and their effect on psychological distress in the two study periods.

Information provided by the company about the disease was rated as $M = 7.35$; SD $= 2.44$ (Table 3).

Comparing the two phases of the pandemic, no differences were observed in the number of sources consulted, but there were differences in the number of hours per day dedicated to receiving information (less in the second phase), with higher ratings for all search topics during the second phase, including the information provided by the company (Table 3).

3.6. Media or platforms from which information on the COVID-19 pandemic is received

The most commonly used media for information on the COVID-19 pandemic have been social networks (WhatsApp, Facebook, Instagram, etc.), followed by television and the websites of official bodies or scientific societies. When comparing the two study periods, the percentages of use of social networks and television decreased in the second phase, while the percentage of use of websites of official bodies or scientific societies increased (Table 4).

The chi-squared statistic allowed to contrast the proportion of people who used a given media or communication platform in both periods. Table 4 does not include non-cases, this value being the difference of $N = 1309$ compared with the cases in each of the indicated media or platforms. It is possible to observe that there were significant differences in the use of social media, TV, web pages of official organisms or scientific societies, Google or other search engines and radio.

4. Discussion

In this study, it was found that PD was lower in the second period of time analysed (February 2021) than in the first period (April 2020), which is consistent with the results from previous studies that observed a

Table 3. Sources of information consulted about the pandemic, time dedicated and type of information in the two study periods.

			April 2020 (n = 904)		February 2021 (n = 405)		Student's T-test	
	M	SD	M	SD	M	SD	Statistical	p
No of sources consulted	3.87	2.06	3.89	2.02	3.81	2.16	0.691	.490
No of daily hours	4.49	3.56	4.95	3.90	3.47	2.35	8.471	<.001
Information on COVID-19*								
Symptoms	7.91	2.20	7.74	2.31	8.29	1.88	−4.594	<.001
Diagnosis	7.09	2.35	6.86	2.43	7.61	2.07	−5.740	<.001
Treatment	6.00	2.63	5.63	2.69	6.81	2.31	−8.122	<.001
Transmission routes	8.15	2.15	7.90	2.26	8.68	1.77	−6.719	<.001
Preventive measures	8.47	1.96	8.21	2.10	9.05	1.45	−8.359	<.001
Information offered by the Dpt., service, unit, company as clear and accurate*	7.35	2.44	7.26	2.42	7.87	2.46	−2.354	.020

*Score range from 1 to 10.
- Questioned about nine sources: social media (WhatsApp, Facebook, Instagram, etc.), radio, Google or other search engines, web pages of official organisms or scientific societies, official phone numbers or information apps, television, newspapers (online or print), friends or relatives, other.
- The variable "Information on COVID-19" is about the belief to have enough information Regarding the symptoms, treatment, transmission routes and preventive measures for COVID-19.

Table 4. Means or platforms from which information on the COVID-19 pandemic is received in the two study periods.

Means or platforms through which information on COVID-19 has been or is being received	N° cases	Percentage	April 2020 (n = 904) N° cases	April 2020 Percentage	February 2021 (n = 405) N° cases	February 2021 Percentage	Chi-squared Statistical	Chi-squared p
Social media (WhatsApp, Facebook, Instagram, etc.)	1098	83.9	792	87.6	306	75.6	30.062	<.001
Television	888	67.8	634	70.1	254	62.7	7.052	.008
Web pages of official organisms or scientific societies	767	58.6	512	56.6	255	63.0	4.613	.032
Friends or relatives	562	42.9	388	42.9	174	43.0	.0002	.989
Google or other search engines	571	43.6	372	41.2	199	49.1	7.252	.007
Newspapers (online or print)	444	33.9	305	33.7	139	34.3	.042	.837
Radio	329	25.1	243	26.9	86	21.2	4.738	.029
Official phone numbers or information apps	341	26.1	237	26.2	104	25.8	.042	.838
Other (Professional bodies, company, …)	63	4.8	38	4.2	25	6.2	2.368	.124

high level of PD in the acute phases of the disease. This is why psychological counselling in this phase of the pandemic is proposed as a key to treatment [31]. The higher level of PD in the first phase of the pandemic may be explained by less information being available about the pandemic than during the second phase, a factor that has been associated with PD in both previous epidemics [32] and the current pandemic [18]. It could also be due to the emergence of proven effective preventive and diagnostic measures such as vaccines and immediate diagnostic methods such as antigen testing.

During the second phase, the number of hours spent on information about COVID-19 decreased, although respondents claimed to have better information about all aspects related to the pandemic: symptoms, prognosis, treatment, transmission routes and preventive measures, as well as the information given by their company. The quality of information received is also a variable that has been associated with PD [18,33].

Another factor that may justify the decrease in PD levels is that the belief in the probability of surviving COVID-19 if becoming infected increased in the second phase ($M = 8.25$; SD = 1.80) in relation to the first phase ($M = 7.85$; SD = 2.11) $p < .001$, as well as the trust on health professionals for diagnosis of the disease ($M = 8.57$; SD = 1.57), compared to the first phase of the pandemic ($M = 7.16$; SD = 2.30). Trust in the health system also increased during the second pandemic phase, but with lower values of trust in its professionals.

Having become accustomed to preventive measures during the second phase of the pandemic is another factor that may justify the reduction in PD in this phase compared to the first. Likewise, better assessment is another factor that may be behind this decrease in PD.

Social media, followed by television and the websites of official bodies or scientific societies, were the most widely used sources of information on COVID-19, similar to what was found in Peru [34]. This is why it has been suggested that the Public Health Administration has an important role to play in making this quality information accessible to the population, especially in the most widely used media such as social networks, counteracting fake news that tend to be frequent on the internet [35]. Focussing on the

Colombian healthcare workforce (nurses, nursing assistants, and doctors), the internet and scientific articles were the principal sources of information [36,37]

An association between the information received and the use of preventive measures has been found [38]. It is suggested that the commitment with preventive measures requires simple, clear and understandable messages to reinforce knowledge, especially among the low- and middle-income population [39] who may have a lower educational level. The higher use of preventive measures during the second pandemic phase, which may justify a lower PD, may be motivated by the better information respondents reported having in this phase of the disease. This coincides with the most recommended preventive measures by the Health Administration at that time of the pandemic such as handwashing with hydroalcoholic solution and wearing a mask regardless of the context. Leaving at least 1.5 m of distance as not been equally followed by the population. It is, then, known that knowledge is the best predictor of positive attitudes towards the pandemic and that attitude the best predictor of good practice, with differences according to age and sex [40].

Another possible explanation for the higher PD in the first phase of the pandemic could be the home confinement [5], whose association with high PD is documented both for the current pandemic [16,17] and in previous pandemics [41]. Loneliness to which a large number of people was forced during that first phase made them more vulnerable to PD, although the reverse effect is also known: individuals with poorer mental health are prone to loneliness [42]. However, the special characteristics of isolation by COVID-19 in Colombia and the lack of information during the first phase of the pandemic could bring about the idea that, most likely, distress caused by misinformation could be merged with the significance of an informal economy system, a high proportion of migrant workers, and a weak social system, make this country exceptionally vulnerable to social distancing measures, whereas nearly 5,000,000 of home infrastructures have space deficiencies, and domestic violence increased drastically during the lockdown period [43,44].

In some studies, age and sex have been found to be the main determinants of PD in times of COVID-19, as well as of the level of concern and knowledge about the pandemic [45]. However, other studies found these variables to have a modest level of prediction [19]. For example, regarding age, in Argentina, and Colombia, people older than 42 are the ones who agree more with conspiracy ideas; while in Mexico, and Venezuela, people between 23 and 42 years old are the ones who support those beliefs the most [46]. Regarding sex, the mediation of the government information was observed, concluding that being a woman would be a risk factor due to higher stress levels during the pandemic, something that previous works have already pointed out [37,47]. Excessive worry, catastrophizing thoughts, fear and loss of control, could be main symptoms of general distress in this group, and this could develop anger, sadness and even, depression and anxiety [47]. It is also known that the highest mortality occurs among those over 60 years of age and men [6], although this study shows that the level of PD is higher among women and younger people, and these data coincide with the results obtained in Ecuador or Spain, although in Chile this was observed among older people [48]. The main cause could be the difference in movement restriction or health measures imposed during the pandemic.

In the Eurofound study, conducted in 27 European countries and with a methodology similar to this article, insecure employment or housing, poor economy, and difficulties in purchasing basic necessities were found to be associated with the level of PD and mental health [49]. A future line of research may delve deeper into the association of socioeconomic variables and mental health during the current pandemic, something already found in previous pandemics [10] and which would reinforce the need to prioritise certain population groups.

Similarly, it is known that the pandemic has generated an increase in medical and surgical waiting lists, with the consequent increase in mortality from serious illnesses, but the influence on the mental health of people who have had to suffer these delays in health care has been less analysed, although there are certain studies that did find an increase in PD in this group [50]. In contrast, other studies found that cancer patients had less PD than healthy people, but more anxiety about their health. This may be explained by the fact that the experience of having a serious illness such as cancer may have better prepared them to cope with the COVID-19 pandemic [51]. It is therefore clear that several lines of research could be opened up to analyse in depth the effects on mental health derived from the COVID-19 pandemic, given the difficulty in identifying intervening factors caused by their interrelation.

It has been suggested that it is necessary to make the most of the technical solutions for resolving the access restrictions to health centres, of which

telemedicine is a good example. The ultimate goal would be to achieve an appropriate level of efficiency. In Colombia, there are recent examples of the use of telemedicine to provide health care to the large number of people living in places at a great distance from urban centres [52,53]. There are positive experiences of the use of telemedicine in the COVID-19 pandemic [54] and in neighbouring countries such as Peru, for oncological diseases [55], being a technique that has been found useful in psychiatry [56] and in mental health prevention in general [57]. The use of telemedicine, already successfully implemented in Colombia, for medical diagnosis, identification of health problems or preventive measures related to mental health in remote areas of the country would be recommendable.

Among the limitations of the study, internet access was needed to be able to participate, maybe generating an over-representation of the group with a higher educational level and those who lived in urban areas. The use of the "snowball" methodology could produce a participation bias, although the need to obtain information in the first phase of the pandemic made it necessary to implement this type of approach, which coincides with the methodological tool chosen in the Eurofound project with data from 27 European countries [30]. The sample in the two phases of the pandemic differs in some socio-demographic variables, but these differences are maintained once the stratified analysis has been carried out. Lastly, the number of questionnaire responses that were excluded (12.5%, for non-response of the complete survey) could be related with the high number of questions and time spent to answer.

This study is part of an international project entitled IMPACTCOVID-19. This research is carried out in several countries, mainly in Central and South America, as well as in Europe. One of its strong points is the use of the same methodology, socio-culturally adapted to each country, facilitating the comparability of its results.

5. Conclusions

Differences between the two studied periods of the pandemic (2020–2021) have been observed, with PD decreasing in the second period, when a greater use of certain preventive measures against COVID-19 has been found, coinciding with the recommendations made by health officials at the time of the pandemic. In similarity to other studies, PD was higher among women and people living without a partner, but no differences were found in association with age, educational level, having children, or being a healthcare professional.

Being a carrier and transmitting the virus was the greater concern in both periods. However, confidence in the health system and its professionals increased during the second phase of the pandemic.

Health Authorities should increase the accessibility of quality information on the pandemic and should promote this information in the most widely used sources of information, such as social networks. It would be useful to increase the use of telematic technologies, such as telemedicine, to include activities that help diagnoses and treatment of the mental health effects of COVID-19.

Informed consent statement

The ethical principles set out in the Declaration of Helsinki have been followed. The participants' permission was obtained through informed consent in which they expressed their voluntary desire to participate in the study.

Author contributions

All the authors have intellectually contributed to the work, met the conditions of authorship, and approved its final version. This work is original and has not been previously published and is not under review by any other journal. This manuscript conforms to the ICMJE Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals.

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Data availability statement

All data are available within this article. All datasets could be accessed under reasonable query to the authors.

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