Personality and Individual Differences 172 (2021) 110591

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Longitudinal study on affect, psychological well-being, depression, mental and physical health, prior to and during the COVID-19 pandemic in Spain

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ARTICLE INFO

Keywords:
COVID-19
Affect
Psychological well-being
Depression
Physical health
Mental health
Gender differences

ABSTRACT

This longitudinal study, before and during the confinement of the COVID-19 pandemic, is to determine the evolution and effects on affect, psychological well-being, depression, and mental and physical health, during an ordinary week, from March 1 to March 7, in the week leading up to the establishment of confinement, from March 8 to March 14, and for several weeks of confinement, from March 15 to April 25. The most relevant results reveal significant differences between men and women in the confinement period, on almost all the scales of psychological well-being (SPWB), with the men obtaining a lower mean than the women. The analyses of the differences between the time periods show a significant difference in the Positive Affect scale (PANAS), the ordinary week group obtaining the highest score, and with this score decreasing in the pre-confinement week and the confinement period, and Negative Affect scale (PANAS) remained stable We found no significant differences in the participants' total depression score (BDI-II). S we obtained significant differences in the Role Physical and Physical Health Component scales (SF-36) between the pre-confinement week, with the highest mean, and the confinement.

1. Introduction

The World Health Organization declared the outbreak of the COVOD-19 disease caused by the coronavirus an international public health emergency on January 30, 2020, and a global pandemic on March 11. In Spain, the government decreed the state of alarm on March 14 (Real Decreto 463/2020).

Derived from this state of alarm, a period of confinement or quarantine was imposed throughout the Spanish territory to stop and minimize the expansion of the coronavirus and reduce the health emergency. The confinement period was imposed from March 14 to May 3, mandatory throughout the Spanish territory. The global pandemic of COVID-19 forced many countries to introduce confinement measures to minimize the spread of the virus. A period of confinement represents a radical change in people's lifestyles, an interruption of their usual daily activities.

Quarantine and isolation are adopted to protect people's physical health when there is a risk of infectious diseases, but it is essential to take into account the mental health implications of the people experiencing such restrictions (Hossain et al., 2020). Quarantine is often an unpleasant experience for those who suffer it; separation from loved ones, loss of freedom, uncertainty about the state of illness, and boredom can sometimes have pernicious effects (Brooks et al., 2020).

Brooks et al. (2020) conduct a recent review of the evidence from other recent pandemics about the psychological impact of quarantine, to explore the possible effects on mental health and psychological well-being, concluding that the most reviewed studies reported negative psychological effects including post-traumatic stress symptoms, confusion, and anger.

Recent available studies on COVID-19 and mental health are mostly of a cross-sectional nature. Gao et al. (2020) conducted a study to assess the prevalence and distribution of anxiety and depression among the Chinese population, examining their association with social media exposure during the COVID-19 outbreak. They conducted the study online from January 31 to February 2, and people from 31 provinces and autonomous regions of China participated. Upon comparing the data with the national data, they found that the prevalence of depression (48.3%), anxiety (22.6%) and the combination of both (19.4%) was much higher during the COVID-19 outbreak in Wuhan, China. Also, more than 80% of the participants reported that they were frequently exposed to social media, and their results showed that there was a high prevalence of problems of anxiety, depression, and the combination of

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https://doi.org/10.1016/j.paid.2020.110591
Received 23 September 2020; Received in revised form 3 December 2020; Accepted 6 December 2020
Available online 14 December 2020
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both, which were positively associated with frequent use of social media during the COVID-19 outbreak.

Cao et al. (2020), in their cross-sectional study investigating the anxiety levels of university students of the Changzhi medical faculty during the COVID-19 epidemic, indicated that 0.9% of the participants experienced severe anxiety, 2.7% moderate anxiety, and 21.3% mild anxiety, and about three-quarters (75.1%) had no symptoms of anxiety. Living in urban areas, the stability of family incomes, and living with their parents also acted as protectors against anxiety.

Roy et al. (2020) conducted another cross-sectional study in India among the adult Indian population during the COVID-19 pandemic. They assessed the level of knowledge about the infection, attitudes towards COVID-19, anxiety levels, the perceived need for mental health care, sleep problems, paranoia about getting infected, and discomfort caused by the media information, from March 22 and to March 24. Their results showed high levels of anxiety; more than 80% of the people were concerned about the COVID-19 pandemic, and 72% of them informed about the need to use gloves and disinfectants, 12.5% of the participants reported having sleep difficulties, 37.8% of were paranoid about the idea of getting infected by the new coronavirus, and 36.4% had social media-related distress. They also noted that 80% of the participants felt the need for help from expert mental health professionals to treat emotional and other psychological problems during this pandemic. In the studied population, more than 90% of the participants were graduate students and above, and approximately, half of the population were healthcare professionals.

Currently, we have almost no information about the longitudinal change in mental health status throughout the COVID-19 epidemic. The first and apparently the only longitudinal study was done by Wang et al. (2020), who assessed the psychological impact, stress, anxiety, and depression during the initial outbreak and the peak of the COVID-19 epidemic four weeks later, and the protective factors among the general population of 190 cities in China. This longitudinal study was carried out from January 31 to February 2 (first survey) and from February 28 to March 1 (second survey). These authors found that, during the initial phase and four weeks later during the COVID-19 epidemic in China, there was a statistically albeit not clinically significant reduction in psychological impact. There were no significant temporal changes in the levels of stress, anxiety, and depression between the first and second surveys. They also found that during the initial evaluation, moderate to severe stress was observed in 8.1% of the participants, anxiety in 28.8%, and depression in 16.5%, and there were no significant longitudinal changes in stress, anxiety, and depression levels. The protective factors included a high level of confidence in physicians, perceived likelihood of survival, low risk of COVID-19, satisfaction with the amount of health information available about COVID-19, and personal precautionary measures.

Available cross-sectional studies on COVID-19 and mental health cannot report longitudinal changes in the mental health outcomes of the people who are confined. Added to this, they barely assess affect and well-being, nor do they contemplate a general view of mental and physical health.

This longitudinal study is the first to be carried out in Spain and was designed to provide information on affect, well-being, depression, and mental and physical health, before and during the COVID-19 pandemic in Spain.

The main objective of this longitudinal study over time is to determine the evolution and effects on affect, psychological well-being, depression, and mental and physical health, over three consecutive time periods: during an ordinary week (from March 1 to March 7), in the week leading up to the establishment of the confinement (from March 8 to March 14), and for several weeks of confinement (from March 15 to April 25), with different people in each of the time periods.

Our intention is to provide a general view of the evolution of these variables, to determine whether or not there have been changes in them, and to determine the impact of the confinement on people who have not had COVID-19 but who have been confined for several weeks.

2. Materials and methods

2.1. Participants and procedure

Participants were 647 undergraduate students, with a mean age of 34.92 years (SD = 11.26), and age ranging between 18 and 69 years. There were 138 (21.3%) men in the sample, mean age 38.75 years (SD = 12.46), age range between 19 and 66 years, and 509 (78.7%) women, mean age 33.88 years (SD = 10.69), age range between 18 and 69 years.

The total of the 647 people belong to three different groups depending on the time period in which they participated in the study. The period involving the collection of data was from March 1 to April 25, 2020.

Group 1, from March 1 to March 7, called the ordinary week, is made up of the participants who completed the tests during that week, when the World Health Organization had already stated that the outbreak of the new coronavirus constituted an international public health emergency. On February 11, 2020, the World Health Organization named this new coronavirus disease "COVID-19" and declared the public health emergency. This is a previous week during which there was no public warning that confinement measures could be established in the following weeks.

Group 2, from March 8 to March 14, called the pre-confinement week, is made up of the participants who completed the tests during that week in which the World Health Organization raised the international public health emergency by COVID-19 to a situation of pandemic, on March 11. During this week, the media began to report possible confinement.

Group 3, from March 15 to April 25, called the confinement period, is made up of the participants who completed the tests over a six-week period. The period begins with the beginning of the declaration of the state of alarm by the government of Spain on March 14, and is the beginning of the mandatory confinement of the population throughout the Spanish territory. Full confinement has lasted until May 3. From this date on, deconfinement measures began very slowly and progressively. Participants were recruited week by week throughout this time period. Table 1 shows the three groups.

These people were recruited from the National University of Distance Education (UNED) and volunteered to take part in this study. They were not rewarded for taking part in the study. Due to the characteristics of the National University of Distance Education (UNED), the participants are representative of the general population, they study and work, practice different professions, live in urban and rural environments, and have a very wide age range.

All subjects gave written informed consent to participate in the

Table 1
Characteristics of the three groups.

Group 1	Male N = 26 (23.9%)
From March 1 to March 7	Mean age 41.85 (SD = 11.40)
Ordinary week	Range 26 to 62 years
Total Sample N = 109	Female N = 83 (76.1%)
Mean age 35.98 (SD = 11.14)	Mean age 34.14 (SD = 10.46)
Range 18 to 62 years	Range 18 to 57 years
Group 2	Male N = 21 (19.1%)
From March 8 to March 14	Mean age 39.67 (SD = 14.24)
Pre-confinement week	Range 19 to 66 years
Total Sample N = 110	Female N = 89 (80.9%)
Mean age 33.11 (SD = 10.91)	Mean age 31.56 (SD = 9.41)
Range 18 to 66 years	Range 18 to 55 years
Group 3	Male N = 91 (21.3%)
From March 15 to April 25	Mean age 37.66 (SD = 12.29)
Confinement period	Range 19 to 65 years
Total Sample N = 428	Female N = 337 (78.7%)
Mean age 35.12 (SD = 11.35)	Mean age 34.43 (SD = 11.01)
Range 18 to 69 years	Range 18 to 69 years

study. The study protocol was approved by the Bioethics Committee of the Faculty of Psychology of the National University of Distance Education. The data provided were anonymous and were treated according to Spanish law regarding general data protection. This study followed the Declaration of Helsinki and ethical guidelines.

2.2. Measures

2.2.1. Positive and Negative Affect Schedule (PANAS)

The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) has 20 items (words) concerning affect that are rated on a 5-point Likert-type scale ranging from 1 (*very slightly or never*) to 5 (*extremely*). It measures two independent and uncorrelated dimensions, 10 words assess positive affect (Positive Affect scale) and 10 words assess negative affect (Negative Affect scale). The PANAS can be used to assess affective states (e.g., present moment, today, past few days), moods (e.g., past week, past month), and traits, depending on the time frame provided by the instructions (Watson & Clark, 1997).

Participants can respond according to one or more instructions: (a) at this moment, (b) today, (c) in the past few days, (d) in the past week, (e) in the past few weeks, (f) in the past month, (g) in the past year, (h) in general.

"Positive Affect (PA) reflects the extent to which a person feels enthusiastic, active, and alert. High PA is a state of high energy, full concentration, and pleasurable engagement, whereas low PA is characterized by sadness and lethargy. In contrast, Negative Affect (NA) is a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness, with low NA being a state of calmness and serenity" (Watson et al., 1988, p. 1063).

In this investigation, we asked participants to respond according to how they feel these days. We used the Spanish adaptation of Sandín et al. (1999).

The PANAS has been validated all over the world and generally shows good psychometric properties, and has been translated successfully into foreign languages (e.g., Gaudreau et al., 2006; Hilleras et al., 1998; Joiner Jr et al., 1997; Lim et al., 2010; Sandín et al., 1999; Watson et al., 1988). In the population of our study, the reliability (internal consistency) was assessed with Cronbach's alpha coefficient, the results can be seen in Table 2.

2.2.2. Ryff's Scales of Psychological Well-being (SPWB)

Ryff's Scales of Psychological Well-Being (SPWB; Ryff, 1989a,b) were designed to test her six-component model of personal growth and psychological well-being. It was specifically designed to measure positive aspects of psychological functioning on six theoretically-motivated dimensions: Self-Acceptance (positive attitude towards oneself and one's past life), Positive Relations with Others (having satisfying, high-quality relationships), Autonomy (independence and self-determination), Environmental Mastery (ability to manage one's life), Personal Growth (being open to new experiences), Purpose in Life (believing that one's life is meaningful) (Ryff, 1989a,b; Ryff & Keyes, 1995).

The original version consists of six dimensions of 20 items each. Van Dierendonck (2004) proposed a short version of 39 items for the six scales, the scales' length varied between six items (Self-Acceptance, Positive Relations with Others, Environmental Mastery, Purpose in Life), seven items (Personal Growth), and eight items (Autonomy); a six-point response scale was used for all scales, ranging from 1 (*totally disagree*) to 6 (*totally agree*).

Díaz et al. (2006) adapted the version of Van Dierendonck (2004) to the Spanish population, and this adapted version is the one we used in this study. The instrument has a total of six scales and 29 items which participants rate on a response format with scores ranging between 1 (*disagree strongly*) y 6 (*agree strongly*). The scales contain 4 to 6 items.

The reliability and validity of the multiple versions of the Ryff's Scales of Psychological Well-Being have been well documented and there have been a number of psychometric studies of the multidimensional structure of the SPWB (e.g., Abbott et al., 2010; Cheng & Chan, 2005; Díaz et al., 2006; Lindfors et al., 2006; Ryff, 1989b; Ryff & Keyes, 1995; Springer & Hauser, 2006; Van Dierendonck, 2004). Table 2 presents the results of internal consistency in the population of this study.

2.2.3. Beck Depression Inventory-II (BDI-II)

The Beck Depression Inventory-II (BDI-II; Beck et al., 1996) was developed following symptoms from the DSM-IV and is a self-report questionnaire that is designed to measure the severity of depressive symptoms in adolescents and adults (Beck et al., 1996). The BDI-II consists of 21 items, the questions relate to symptoms of depression during the past two weeks, including today, and are rated on a 4-point scale ranging from 0 to 3. Absence (or "as usual") of depressive symptoms in each item is scored as "0" and the presence of symptoms is scored between 1 and 3. On two items, there are seven options to indicate either an increase or decrease of appetite and sleep. Items are summed to create a total score, ranging from 0 to 63, with higher scores indicating more intense symptom severity.

The factorial analysis of the BDI-II has generally identified a two-factor structure in Spanish population. Sanz, Perdigón, and Vázquez (2003) have identified a general dimension of depression and two related factors, cognitive-affective and somatic-motivational, similar to the factor structure reported in other studies and with samples from different countries (Sanz, Perdigón, & Vázquez, 2003).

We used the Spanish adaptation of Sanz, Navarro, and Vázquez (2003), and we obtained the total score of the BDI-II and the scores of the two factors, cognitive-affective and somatic-motivational.

Numerous studies have established the reliability and validity of the BDI-II in different populations and cultures (e.g., Al-Musawi, 2001; Beck et al., 1996; Byrne et al., 2004; Dozois et al., 1998; Grothe et al., 2005; Kumar et al., 2002; Osman et al., 2004; Poursadeghiyan et al., 2016; Sanz, Navarro, & Vázquez, 2003; Sanz, Perdigón, & Vázquez, 2003). Table 2 shows the results of internal consistency in the population of this study.

2.2.4. Health Survey SF-36 Questionnaire (SF-36)

The Health Survey SF-36 Questionnaire (SF-36; Ware & Sherbourne, 1992) was developed from the Medical Outcome Study (MOS; Ware & Sherbourne, 1992). It is applicable to the general population as well as to clinical groups (McHorney et al., 1992; McHorney et al., 1994). The SF-36 is a generic measure of health status as opposed to one that targets a specific age, disease, or treatment groups (Ware & Gandek, 1998).

It is comprised of 36 items that report positive and negative states of physical health and emotional well-being. It identifies 8 dimensions of health: Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role Emotional, and Mental Health. Subsequently, a new dimension has been included, called Health Transition, which refers to the changes in the perception of the present state of health compared to how it was a year ago.

Higher scores indicate a better state of health and/or a better quality of life in different areas. Summary scores for a Physical Health Component (Physical Functioning, Role Physical, Bodily Pain, and General Health) and a Mental Health Component (Vitality, Social Functioning, Role Emotional, and Mental Health) can also be derived.

We used a Spanish version, which has shown good internal consistency, reliability, and validity in clinical samples (Alonso et al., 1995; Alonso et al., 1998). We applied the version that asks participants about all the health dimensions of the past 4 weeks, except for the dimensions of Physical Functioning and General Health.

The reliability and validity of the SF-36 have been well documented by the developers of the instrument and in various studies (e.g., Alonso et al., 1995; Alonso et al., 1998; Apolone & Mosconi, 1998; Fukuhara et al., 1998; Gandek et al., 1998; Li et al., 2003; Pappa et al., 2005;

Table 2
Cronbach's alphas, means, standard deviations of the variables examined.

		Group 1 (1/3/2020 to 7/3/2020) (ordinary week)						Group 2 (8/3/2020 to 14/3/2020) (pre-confinement week)						Group 3 (15/3/2020 to 25/4/2020) (confinement period)					
	Global sample $N = 647$	Total sample N = 109		Male N = 26		Female N = 83		Total sample N = 110		Male N = 21		Female N = 89		Total sample N = 428		Male N = 91		Female N = 337	
Scale	Cronbach's alpha	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Positive and Negative Affect Schedule (PANAS)																			
Positive Affect	0.91	35.65	7.06	35.46	7.99	35.71	6.79	33.15	7.19	35.57	7.58	32.58	7.02	32.82	7.38	32.40	7.21	32.93	7.44
Negative Affect	0.90	20.53	7.16	20.42	6.65	20.57	7.35	21.29	7.23	20.76	7.79	21.42	7.14	21.79	7.68	21.91	8.44	21.76	7.48
Psychological Well-Being Scales (PWBS)																			
Self-Acceptance	0.85	18.62	3.24	17.62	3.39	18.94	3.14	17.95	4.09	17.48	5.48	18.07	3.72	18.03	3.82	16.80	4.32	18.36	3.61
Positive Relations with Others	0.82	22.70	5.87	20.73	5.40	23.31	5.90	22.51	5.40	20.81	7.33	22.91	4.80	22.91	5.32	20.55	5.41	23.55	5.12
Autonomy	0.79	25.88	5.69	24.35	5.66	26.36	5.65	25.71	6.01	23.86	6.89	26.15	5.74	25.81	5.79	25.64	6.15	25.85	5.70
Environmental Mastery	0.70	22.89	4.42	21.31	3.63	23.39	4.55	21.39	4.89	21.67	7.08	21.33	4.27	21.77	4.41	20.47	4.52	22.12	4.33
Personal Growth	0.76	21.39	2.79	20.69	2.73	21.60	2.79	21.10	3.20	20.48	5.15	21.25	2.56	20.76	3.20	19.44	3.81	21.12	2.91
Purpose in Life	0.85	23.71	4.02	23.15	3.99	23.88	4.04	22.65	5.00	22.52	7.11	22.69	4.41	22.61	4.76	21.23	5.20	22.98	4.57
Beck Depression Inventory-II (BDI-II)																			
Cognitive Affective	0.88	4.78	5.13	5.19	4.80	4.65	5.25	5.52	5.73	6.33	6.46	5.33	5.57	5.47	6.01	6.54	7.27	5.18	5.60
Somatic Motivational	0.83	4.21	3.36	3.85	2.75	4.33	3.54	4.16	3.17	3.62	3.20	4.29	3.17	4.30	3.60	4.04	3.79	4.36	3.55
Total Depression	0.92	8.99	7.87	9.04	6.73	8.98	8.23	9.68	7.88	9.95	9.18	9.62	7.60	9.76	8.95	10.58	10.46	9.54	8.50
Health Survey SF-36 Questionnaire (SF-36)																			
Physical Functioning	0.90	28.24	3.39	27.73	4.28	28.40	3.07	28.62	2.68	29.48	1.28	28.42	2.88	28.22	3.06	28.41	3.11	28.18	3.05
Role Physical	0.94	17.77	3.16	17.58	3.50	17.83	3.07	18.25	2.94	18.48	1.94	18.19	3.13	17.24	3.96	17.48	3.95	17.17	3.96
Bodily Pain	0.81	8.91	1.99	8.88	1.79	8.92	2.06	8.83	2.04	9.10	1.48	8.76	2.15	8.54	2.32	8.63	2.46	8.51	2.29
General Health	0.82	19.37	3.85	18.77	3.39	19.55	3.98	19.65	3.84	19.86	4.15	19.61	3.79	18.75	3.94	18.59	4.04	18.80	3.92
Vitality	0.86	13.71	3.31	13.73	2.94	13.70	3.43	13.65	2.80	14.29	3.53	13.51	2.60	13.71	3.24	14.01	3.18	13.63	3.26
Social Functioning	0.85	8.38	1.93	8.27	1.93	8.41	1.94	8.39	1.88	8.52	2.11	8.36	1.84	8.14	2.20	8.09	2.29	8.16	2.18
Role Emotional	0.92	12.72	2.63	12.50	2.77	12.80	2.60	12.67	2.60	12.81	3.09	12.64	2.49	12.56	2.81	12.80	2.78	12.49	2.82
Mental Health	0.85	18.55	3.92	19.00	2.46	18.41	4.28	18.52	3.68	19.43	4.47	18.30	3.46	18.53	3.65	18.67	3.97	18.49	3.56
Physical Health Component(a)	0.91	74.28	9.50	72.96	10.00	74.69	9.36	75.34	8.76	76.90	6.84	74.97	9.15	72.75	10.82	73.10	10.44	72.65	10.93
Mental Health Component(b)	0.93	53.35	10.26	53.50	8.43	53.31	10.82	53.23	9.11	55.04	12.23	52.80	8.24	52.94	10.12	53.57	10.58	52.77	10.00

Note:
(a) Physical Health Component is the sum of Physical Functioning, Role Physical, Bodily Pain and General Health.
(b) Mental Health Component is the sum of Vitality, Social Functioning, Role Emotional and Mental Health.

Table 3
Analysis of the differences between men and women in the variables studied within each group or time period.

	Group 1 (1/3/2020 to 7/3/2020) (ordinary week) Total Sample N = 109; Male *N* = 26; Female *N* = 83						Group 2 (8/3/2020 to 14/3/2020) (pre-confinement week) Total Sample *N* = 110; Male *N* = 21; Female *N* = 89						Group 3 (15/3/2020 to 25/4/2020) (confinement period) Total Sample *N* = 428; Male *N* = 91; Female *N* = 337					
	Levene's test		Student's test				Levene's test		Student's test				Levene's test		Student's test			
	F	p	t (df)	p	Mean diffe.	Cohen's d	F	p	t (df)	p	Mean diffe.	Cohen's d	F	p	t (df)	p	Mean diffe.	Cohen's d
Age	0.216	0.643	3.206** (107)	0.002	7.70	0.70	8.855**	0.004	2.482* (24.276)	0.020	8.10	0.67	3.302	0.070	2.421* (426)	0.016	3.22	0.27

	Group 1 (1/3/2020 to 7/3/2020) (ordinary week) Total Sample N = 109; Male N = 26; Female N = 83						Group 2 (8/3/2020 to 14/3/2020) (pre-confinement week) Total Sample N = 110; Male N = 21; Female N = 89						Group 3 (15/3/2020 to 25/4/2020) (confinement period) Total Sample N = 428; Male N = 91; Female N = 337					
	Levene's test		Student's test				Levene's test		Student's test				Levene's test		Student's test			
Scale	F	p	t (df)	p	Mean diffe.	Cohen's d	F	p	t (df)	p	Mean diffe.	Cohen's d	F	p	t (df)	p	Mean diffe.	Cohen's d
Positive and Negative Affect Schedule (PANAS)																		
Positive Affect	0.118	0.732	−0.156 (107)	0.876	−0.24	−0.03	0.015	0.904	1.727 (108)	0.087	2.98	0.40	0.024	0.876	−0.614 (426)	0.540	−0.53	−0.07
Negative Affect	0.322	0.572	−0.088 (107)	0.930	−0.14	−0.02	0.228	0.634	−0.371 (108)	0.711	−0.65	−0.08	1.384	0.240	0.164 (426)	0.870	0.14	0.01
Psychological Well-Being Scales (PWBS)																		
Self-Acceptance	0.670	0.415	−1.837 (107)	0.069	−1.32	−0.40	2.326	0.130	−0.594 (108)	0.554	−0.59	−0.12	3.563	0.060	−3.501*** (426)	0.001	−1.56	−0.39
Positive Relations with Others	0.191	0.663	−1.983* (107)	0.050	−2.58	−0.45	4.742*	0.032	−1.251 (24.197)	0.223	−2.10	−0.33	0.118	0.731	−4.886*** (426)	0.000	−2.99	−0.56
Autonomy	0.022	0.884	−1.586 (107)	0.116	−2.01	−0.35	0.243	0.623	−1.579 (108)	0.117	−2.28	−0.36	0.017	0.898	−0.312 (426)	0.755	−0.21	−0.03
Environmental Mastery	1.472	0.228	−2.121* (107)	0.036	−2.07	−0.50	7.062**	0.009	0.212 (23.552)	0.834	0.34	0.05	0.046	0.830	−3.187** (426)	0.002	−1.64	−0.37
Personal Growth	0.051	0.821	−1.454 (107)	0.149	−0.91	−0.32	2.452	0.120	−0.991 (108)	0.324	−0.77	−0.18	6.696**	0.010	−3.903*** (119.940)	0.000	−1.67	−0.49
Purpose in Life	0.167	0.684	−0.801 (107)	0.425	−0.72	−0.18	5.951*	0.016	−0.100 (23.751)	0.921	−0.16	−0.02	2.573	0.109	−3.147** (426)	0.002	−1.75	−0.35
Beck Depression Inventory-II (BDI-II)																		
Cognitive Affective	0.041	0.840	0.468 (107)	0.641	0.54	0.10	1.326	0.252	0.722 (108)	0.472	1.00	0.16	10.278***	0.001	1.656 (120.303)	0.100	1.36	0.20
Somatic Motivational	1.164	0.283	−0.631 (107)	0.529	−0.47	−0.15	0.009	0.924	−0.873 (108)	0.385	−0.67	−0.21	0.408	0.523	−0.753 (426)	0.452	−0.32	−0.08
Total Depression	0.939	0.335	0.035 (107)	0.972	0.06	0.01	0.977	0.325	0.174 (108)	0.862	0.33	0.03	7.354**	0.007	0.873 (123.906)	0.384	1.03	0.10
Health Survey SF-36 Questionnaire (SF-36)																		
Physical Functioning	1.354	0.247	−0.874 (107)	0.384	−0.66	−0.17	2.228	0.138	1.643 (108)	0.103	1.06	0.47	0.343	0.558	0.638 (426)	0.524	0.23	0.07
Role Physical	1.396	0.240	−0.356 (107)	0.722	−0.25	−0.07	1.020	0.315	0.398 (108)	0.691	0.28	0.11	0.002	0.963	0.672 (426)	0.502	0.31	0.07
Bodily Pain	0.019	0.891	−0.069 (107)	0.945	−0.03	−0.02	1.189	0.278	0.666 (108)	0.507	0.33	0.18	0.196	0.658	0.421 (426)	0.674	0.11	0.05
General Health	0.263	0.609	−0.906 (107)	0.367	−0.78	−0.21	1.155	0.285	0.267 (108)	0.790	0.25	0.06	0.523	0.470	−0.439 (426)	0.661	−0.20	−0.05
Vitality	0.411	0.523	0.043 (107)	0.966	0.03	0.01	1.328	0.252	1.147 (108)	0.254	0.78	0.25	0.000	0.998	0.988 (426)	0.324	0.37	0.11
Social Functioning	0.499	0.482	−0.322 (107)	0.748	−0.14	−0.07	0.300	0.585	0.357 (108)	0.722	0.16	0.08	0.008	0.928	−0.277 (426)	0.782	−0.07	−0.03
Role Emotional	0.679	0.412	−0.496 (107)	0.621	−0.29	−0.11	0.399	0.529	0.266 (108)	0.791	0.16	0.06	0.222	0.638	0.940 (426)	0.348	0.31	0.11

(*continued on next page*)

Table 3 (*continued*)

Scale	Group 1 (1/3/2020 to 7/3/2020) (ordinary week) Total Sample N = 109; Male N = 26; Female N = 83						Group 2 (8/3/2020 to 14/3/2020) (pre-confinement week) Total Sample N = 110; Male N = 21; Female N = 89						Group 3 (15/3/2020 to 25/4/2020) (confinement period) Total Sample N = 428; Male N = 91; Female N = 337					
	Levene's test		Student's test				Levene's test		Student's test				Levene's test		Student's test			
	F	p	t (df)	p	Mean diffe.	Cohen's d	F	p	t (df)	p	Mean diffe.	Cohen's d	F	p	t (df)	p	Mean diffe.	Cohen's d
Mental Health	5.462*	0.021	0.875 (74.445)	0.384	0.59	0.16	0.279	0.598	1.263 (108)	0.209	1.12	0.28	1.955	0.163	0.412 (426)	0.681	0.17	0.04
Physical Health Component(a)	0.525	0.470	−0.812 (107)	0.419	−1.73	−0.17	0.067	0.797	0.906 (108)	0.367	1.92	0.23	0.126	0.723	0.357 (426)	0.721	0.45	0.04
Mental Health Component(b)	0.598	0.441	0.081 (107)	0.936	0.18	0.01	1.923	0.168	1.012 (108)	0.314	2.23	0.21	1.445	0.230	0.666 (426)	0.506	0.79	0.07

Note:
(a) Physical Health Component is the sum of Physical Functioning, Role Physical, Bodily Pain and General Health.
(b) Mental Health Component is the sum of Vitality, Social Functioning, Role Emotional and Mental Health.
*** $p \leq .001$.
** $p \leq .01$.
* $p \leq .05$.

Sullivan et al., 1995; Ware et al., 1995; Ware Jr & Gandek, 1998a,b; Ware & Sherbourne, 1992). Table 2 presents the results of internal consistency in the population of this study.

2.3. Statistical analysis

For all data analyses, we used the IBM SPSS Statistics for Windows, version 25.0 (IBM Corp. Released, 2017).

In order to analyze the differences between men and women in the variables of affect, well-being, depression and physical and mental health, we used Student's *t*-test for independent samples. When the variances were not significantly different (probability of $F > 0.05$), Student's *t*-test was used with pooled variances; and when they were significantly different, it was used with separate variances.

Analysis of variance (ANOVA) were performed, with the three groups of participants as independent variable and with the variables of affect, well-being, depression and physical and mental health, as the dependent variables. We examined the assumption of homoscedasticity or equality of variance with Levene's test because each group had a different sample size. When the hypothesis of variance equality was rejected, we applied the tests of Brown-Forsythe and Welch. Both tests represent a robust alternative to the ANOVA F-statistic when it cannot be assumed that the population variances are equal. Post-hoc analyses were also performed. When the variances were equal, the Tukey test with a level of $p < .05$ was used to determine statistical significance. When the variances were not equal, the Games-Howell test with a level of $p < .05$ was used.

3. Results

3.1. Descriptive statistics

Means and standard deviations were calculated for each scale. Table 2 presents the results of each group of participants within each time period in which their responses to the tests were collected. The results are also presented separately for men and women.

3.2. Differences between men and women in the variables analyzed, within each time period

Prior to analyzing possible gender differences in the studied variables, to determine the homogeneity of the distribution of males and females over the three groups or time periods, we applied the Pearson chi-square statistic to the contingency tables that reflect the different frequencies of males and females in each group. The results indicated that the percentages of males and females for different groups or time periods were not statistically significantly different, $\chi^2(2) = 0.743$, $p = .690$.

The results of the analysis of the differences between males and females in the variables of affect, well-being, depression, and physical and mental health, can be seen in Table 3.

In all groups, there was a significant age difference between genders, with males having a higher mean age than females. Group 1, $t(107) = 3.206$, $p = .002$, $d = 0.70$ (Males $M = 41.85$, $SD = 11.40$; Females $M = 34.14$, $SD = 10.46$); Group 2, $t(24.276) = 2.482$, $p = .020$, $d = 0.67$ (Males, $M = 39.67$, $SD = 14.24$; Females, $M = 31.56$, $SD = 9.41$); Group 3, $t(426) = 2.421$, $p = .016$, $d = 0.27$ (Males, $M = 37.66$, $SD = 12.29$; Females, $M = 34.43$, $SD = 11.01$).

In measures of affect (PANAS), depression (BDI-II), and physical and mental health (SF-36), no significant differences were observed between males and females within each group or in any of the variables.

The only measure showing gender differences was psychological well-being (SPWB) in Groups 1 (ordinary week) and 3 (confinement period). No significant differences were observed with Group 2 (pre-confinement week).

In Group 1 (ordinary week), gender differences were observed in the

Table 4
Analysis of variance (ANOVA).
Dependent variables: Age, Positive and Negative Affect Schedule (PANAS), Psychological Well-Being Scales (PWBS), Beck Depression Inventory-II (BDI-II), Health Survey SF-36 Questionnaire (SF-36).
Independent variable: Groups.

ANOVA					
	Levene test (p)	Mean Square	F (df)	p	η^2_p
Age	0.168 (0.846)	250.083	1.987 (2644)	0.139	0.006

Scale	Levene test (p)	Mean square	F (df)	p	η^2_p
Positive and Negative Affect Schedule (PANAS)					
Positive Affect	0.637 (0.529)	351.371	6.588*** (2644)	0.001	0.020
Negative Affect	0.403 (0.669)	72.003	1.270 (2644)	0.281	0.004
Psychological Well-Being Scales (PWBS)					
Self-Acceptance	1.310 (0.271)	17.058	1.195 (2644)	0.303	0.004
Positive Relations with Others	0.598 (0.550)	7.758	0.263 (2644)	0.769	0.001
Autonomy	0.078 (0.925)	0.816	0.024 (2644)	0.976	0.000
Environmental Mastery	0.686 (0.504)	71.336	3.515* (2644)	0.030	0.011
Personal Growth	1.647 (0.193)	18.940	1.923 (2644)	0.147	0.006
Purpose in Life	1.724 (0.179)	53.680	2.443 (2644)	0.088	0.008
Beck Depression Inventory-II (BDI-II)					
Cognitive Affective	0.358 (0.699)	22.185	0.653 (2644)	0.521	0.002
Somatic Motivational	0.294 (0.745)	0.930	0.076 (2644)	0.927	0.000
Total Depression	0.332 (0.718)	26.223	0.354 (2644)	0.702	0.001
Health Survey SF-36 Questionnaire (SF-36)					
Physical Functioning	1.919 (0.148)	6.987	0.744 (2644)	0.475	0.002
Role Physical	10.997*** (0.000) Welch test (p) 4.604* (0.011) Brown-Forsythe test (p) 4.755** (0.009)	49.471	3.653* (2644)	0.026	0.011
Bodily Pain	8.301*** (0.000) Welch test (p) 1.813 (0.166) Brown-Forsythe test (p) 1.899 (0.151)	8.189	1.646 (2644)	0.194	0.005
General Health	0.520 (0.595)	43.745	2.853 (2644)	0.058	0.009
Vitality	1.376 (0.253)	0.149	0.915 (2644)	0.985	0.000
Social Functioning	4.230* (0.015) Welch test (p) 1.016 (0.364) Brown-Forsythe test (p) 1.072 (0.344)	4.133	0.926 (2644)	0.397	0.003
Role Emotional	0.959 (0.384)	1.546	0.204 (2644)	0.815	0.001
Mental Health	0.101 (0.904)	0.030	0.002 (2644)	0.998	0.000
Physical Health Component(a)	4.640** (0.010) Welch test (p) 3.770* (0.025) Brown-Forsythe test (p) 3.814*** (0.023)	340.406	3.217* (2644)	0.041	0.010
Mental Health Component(b)	0.954 (0.386)	9.424	0.094 (2644)	0.910	0.000

Note:
(a) Physical Health Component is the sum of Physical Functioning, Role Physical, Bodily Pain and General Health.
(b) Mental Health Component is the sum of Vitality, Social Functioning, Role Emotional and Mental Health.
$N = 646$.
*** $p \leq .001$.
** $p \leq .01$.
* $p \leq .05$.

Positive Relations with Others and Environmental Mastery scales. On both scales, the males' mean was lower than that of the females: in the Positive Relations with Others scale, $t(107) = -1.983$, $p = .050$, $d = -0.45$ (Males, $M = 20.73$, $SD = 5.4$; Females, $M = 23.31$, $SD = 5.9$); in the Environmental Mastery scale, $t(107) = -2.121$, $p = .036$, $d = -0.50$ (Males, $M = 21.31$, $SD = 3.63$; Females, $M = 23.3$, $SD = 4.55$).

In Group 3 (confinement period), gender differences were observed in all the scales of psychological well-being, except for the Autonomy scale. In all these scales, the males' mean was lower than that of females: in the Self-Acceptance scale, $t(426) = -3.501$, $p = .001$, $d = -0.39$ (Males, $M = 16.80$, $SD = 4.32$; Females, $M = 18.36$, $SD = 3.61$); in the Positive Relations with Others scale, $t(426) = -4.886$, $p = .000$, $d = -0.56$ (Males, $M = 20.55$, $SD = 5.41$; Females, $M = 23.55$, $SD = 5.12$); in the Environmental Mastery scale, $t(426) = -3.187$, $p = .002$, $d = -0.37$ (Males, $M = 20.47$, $SD = 4.52$; Females, $M = 22.12$, $SD = 4.33$); in the Personal Growth scale, $t(119.94) = -3.903$, $p = .000$, $d = -0.49$ (Males, $M = 19.44$, $SD = 3.81$; Females, $M = 21.12$, $SD = 2.91$); and in the Purpose in Life scale, $t(426) = -3.147$, $p = .002$, $d = -0.35$ (Males, $M = 21.23$, $SD = 5.20$; Females, $M = 22.98$, $SD = 4.57$).

Table 5
Post-hoc analyses of the analysis of variance (ANOVA).

Dependent variables	Test	Groups		Mean difference	p
Positive Affect	Tukey	Group 1 (1/3/2020 to 7/3/2020) (ordinary week)	Group 2 (8/3/2020 to 14/3/2020) (pre-confinement week)	2.497*	0.031
	Tukey	Group 1 (1/3/2020 to 7/3/2020) (ordinary week)	Group 3 (15/3/2020 to 25/4/2020) (confinement period)	2.834***	0.001
Environmental Mastery	Tukey	Group 1 (1/3/2020 to 7/3/2020) (ordinary week)	Group 2 (8/3/2020 to 14/3/2020) (pre-confinement week)	1.499*	0.037
Role Physical	Games-Howell	Group 2 (8/3/2020 to 14/3/2020) (pre-confinement week)	Group 3 (15/3/2020 to 25/4/2020) (confinement period)	1.009**	0.009
Physical Health Component(a)	Games-Howell	Group 2 (8/3/2020 to 14/3/2020) (pre-confinement week)	Group 3 (15/3/2020 to 25/4/2020) (confinement period)	2.595*	0.025

Note:
(a) Physical Health Component is the sum of Physical Functioning, Role Physical, Bodily Pain and General Health
*** $p \leq .001$.
** $p \leq .01$.
* $p \leq .05$.

3.3. Differences between groups or time periods in the analyzed variables

The results of the analysis of the differences between groups or time periods in the dependent variables of affect, well-being, depression, and physical and mental health, can be seen in Table 4, and the post-hoc tests can be seen in Table 5.

The results of the variance analysis (ANOVA) showed a significant difference between the groups or time periods regarding the variable Positive Affect of the PANAS, Levene test = 0.637, $p = .529$, $MS = 351.371$, $F(2,644) = 6.588$, $p = .001$, $\eta^2_p = 0.020$. The post-hoc tests confirmed the existence of two homogeneous subgroups or subsets based on the means, one made up of Groups 2 (pre-confinement week) and 3 (confinement period) and one made up of Group 1 (ordinary week). The means of Groups (pre-confinement week) and 3 (confinement period) were significantly different from the mean of Group 1 (ordinary week), with this last one obtaining the highest mean: Group 1, $M = 35.65$, $SD = 7.06$; Group 2, $M = 33.15$, $SD = 7.19$; and Group 3, $M = 32.82$, $SD = 7.38$.

On the Scales of Psychological Well-Being (SPWB), there were significant differences between the three groups only on the Environmental Mastery scale, Levene test = 0.686, $p = .504$, $MS = 71.336$, $F(2,644) = 3.515$, $p = .030$, $\eta^2_p = 0.011$. Post-hoc evidence confirmed significant differences between Group 1 (ordinary week) and Group 2 (pre-confinement week), with Group 1 obtaining a higher mean than Group 2: Group 1, $M = 22.89$, $SD = 4.42$; Group 2, $M = 21.39$, $SD = 4.89$. Group 3 (confinement period) had no significant differences with the other groups.

No significant differences between the groups were observed in the BDI-II scales or the total depression score.

Significant group differences were observed in the scales of the SF-36 health questionnaire in Role Physical, Levene test = 10.997, $p = .000$, $MS = 49.471$, $F(2,644) = 3.653$, $p = .026$, $\eta^2_p = 0.011$. Post-hoc evidence confirmed significant differences between Groups 2 (pre-confinement week) and 3 (confinement period), with Group 2 obtaining a higher mean than Group 3: Group 2, $M = 18.25$, $SD = 2.94$ and Group 3, $M = 17.24$, $SD = 3.96$. Group 1 (ordinary week) presented no significant differences with the other groups.

Finally, the Physical Health Component of the SF-36 questionnaire also showed group differences, as in the Role Physical scale, Levene test = 4.640, $p = .010$, $MS = 340.406$, $F(2,644) = 3.217$, $p = .041$; $\eta^2_p = 0.010$. The post-hoc tests confirmed the existence of significant differences between Groups 2 (pre-confinement week) and 3 (confinement period), with Group 2 obtaining a higher mean than Group 3: Group 2, $M = 75.34$, $SD = 8.76$ and Group 3, $M = 72.75$, $SD = 10.82$. Group 1 (ordinary week) presented no significant differences with the other groups.

4. Discussion

The purpose of this study was to examine the effects of confinement and its longitudinal evolution on affect, well-being, depression, and mental and physical health, over three consecutive periods of time. The data were obtained during an ordinary week, in the week prior to the establishment of confinement, and for several weeks of confinement, with different people in each of the time periods.

The results obtained show that there are no differences between men and women in the measures of affect (PANAS), depression (BDI-II), and physical and mental health (SF-36) within each period of time evaluated.

The only variables revealing gender differences were some of the scales of the Scale of Psychological Well-Being (SPWB) between the groups or time periods of ordinary week and confinement period. The pre-confinement week group showed no significant differences.

In the ordinary week, we observed that men had a lower mean than women on the scales of Positive Relations with Others and Environmental Mastery of the Scales of Psychological Well-Being (SPWB).

During the confinement period, gender differences were observed on all Scales of Psychological Well-Being (SPWB), except for the Autonomy scale. In all of them, the men's mean was lower than that of the women. Gender differences were observed in the following scales: Self-Acceptance, Positive Relations with Others, Environmental Mastery, Personal Growth, and Purpose in Life.

Self-Acceptance is one of the central criteria of well-being, and considered a central feature of mental health, self-realization, optimal functioning, and maturity (Keyes et al., 2002; Ryff, 1989b). Positive Relations with Others indicates the ability to maintain stable social relationships, have trustworthy friends, and the ability to love, all components of mental health (Ryff, 1989b). Environmental Mastery the person's ability to choose or create environments appropriate to their psychic conditions and is considered a feature of mental health (Ryff, 1989b). People with high environmental mastery have a greater sense of control over the world and, in turn, feel able to influence the context around them. Personal Growth refers to a person's engagement in developing their potential, continuing to grow, and maximizing their abilities (Keyes et al., 2002; Ryff, 1989b). Purpose in Life implies the need to set goals, define a series of objectives that grant some meaning to

life. It includes beliefs that give a sense of purpose and meaning to life (Ryff, 1989b).

From the results obtained with the variable psychological well-being (SPWB), we can conclude that during the confinement period, the men's levels of psychological well-being were lower than those of the women.

Concerning the results of the analyses of the differences between groups or time periods in the variables affect, well-being, depression, and physical and mental health, we found a significant difference between the time periods in the Positive Affect scale of the PANAS, forming two homogeneous groups in the scores, the pre-confinement week and confinement periods, without differences in their mean scores, and the ordinary week period, whose mean Positive Affect was higher than that of the other two. However, this score gradually decreased in the pre-confinement week and the confinement period. A high score in Positive Affect reflects a high energy state, more concentration, and a pleasurable commitment, and a low score is related to sadness and lethargy (Watson et al., 1988). No significant differences were found between the periods evaluated in the dimension of Negative Affect; this dimension remained stable before and during the confinement.

In the Scales of Psychological Well-Being (SPWB), only the Environmental Mastery scale revealed significant differences between the ordinary week period and the pre-confinement week period, with the former obtaining a higher mean than that of the pre-confinement week. The individual's ability to choose or create environments appropriate to their psychic conditions decreased from the ordinary week to the pre-confinement week and maintained a similar mean during the confinement period as in the pre-confinement week.

No significant differences were observed between the time periods in the total depression score (BDI-II) obtained by the participants, or in either of the two scales of the test.

Regarding physical and mental health (SF-36), we obtained significant differences between the time periods in the Role Physical scale, between the pre-confinement week and the confinement period, with a higher mean in the pre-confinement week than in the confinement period. The Role Physical scale assesses the degree to which physical health interferes with work and other daily activities, including lower-than-desired performance, limitation in the type of activities performed, or difficulty in performing activities. As the score in this scale increases, performance is more optimal, and there is less difficulty performing activities. We observed that the score on this scale decreased during the confinement period.

Finally in the Physical Health Component of the SF-36 questionnaire, we found the same results as in the Role Physical scale of this questionnaire. The Physical Health Component is the sum of the scales that evaluate physical health, and higher scores indicate fewer physical limitations, disabilities, or decreases in well-being and higher energy levels and better physical health. The results obtained show how the score on this scale is lower during the confinement period than in the other two periods.

The results in this longitudinal study cannot be compared with the results obtained in other studies, as there are none that have evaluated these variables in three different but continuous time periods. We can only partially compare some of our results with the longitudinal study of Wang et al. (2020), but these authors evaluated the participants at two times within the confinement period, and we also evaluated them in the two weeks prior to confinement. However, similar to our findings, they found that depression levels remained stable at both times of measurement.

Several limitations of these this study should be mentioned. The target population was not the same at the three times when the target variables were evaluated. As participants collaborated in the research anonymously, it was not possible to apply the questionnaires to them at all three times. We applied self-report measures, so social desirability likely influenced the response to the tests. Another limitation is the cultural homogeneity of the participants in the studies, which advises caution in the generalization of the results, although the heterogeneity of the students of this university allows some generalization of the results.

Despite these limitations, this study is the first longitudinal study that provides evidence of how people's affect, well-being, depression, and mental and physical health changed, before confinement, prior to confinement, and during confinement. These results can help us understand the general health status of the confined population that did not have COVID-19. More longitudinal studies would be needed to confirm these results and analyze more variables, and longitudinal studies are also needed to look at these and other variables after confinement ended to have a more comprehensive view of the whole situation.

5. Conclusions

We can conclude that Positive Affect progressively decreases over time, reaching the lowest level during the week of confinement, whereas Negative Affect remains stable, without rising over time. Psychological well-being decreased more in men than in women during the confinement period but there was no progressive decrease of psychological well-being in either gender over time. Only in the Environmental Mastery scale, a decrease in the pre-confinement week was observed compared to the ordinary week. Participants' depression levels did not vary over time but remained stable. Finally, a slight deterioration in people's physical health during the confinement period compared to pre-confinement week was noted.

CRediT authorship contribution statement

Enrique G. Fernández-Abascal: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Formal analysis, Writing – original draft, Writing – review & editing. **María Dolores Martín-Díaz:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Formal analysis, Writing – original draft, Writing – review & editing.

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