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Early psychological correlates associated with COVID-19 in a Spanish older adult sample

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ABSTRACT

Objectives: Main aims of the study are to examine the early psychological correlates associated with the COVID-19 pandemic and lockdown on the mental health of a Spanish older adult sample and to analyze the influence of past mental disorder (PMD) and current mental disorder (CMD) on those correlates.

Methods: Cross-sectional study based on an online snowball recruiting questionnaire. Psychological correlates assessed with the Depression, Anxiety, and Stress Scale (DASS-21) and Impact of Event Scale (IES). Binary and multinomial logistic regression models were used to identify risk and protective factors.

Results: Final sample included 2,194 individuals aged 60 years or more [mean age (SD)=65.62 (5.05); females: 1,198 (54.6%)]. There were 342 (15.6%) individuals who reported a PMD and 162 (7.4%) who reported a CMD. Avoidant (32.1%) and depressive (25.6%) styles were the most prevalent, regardless of mental health status. Main risk factors for negative affectivity were female gender and history CMD or PMD. However, job stability and the ability to enjoy free time were generally associated with better outcomes. No differences were found in psychological correlates between those with no lifetime history of mental disorder versus PMD on the DASS-21 or IES. However, CMD was associated with higher anxiety scores on the DASS-21 [Odds Ratio=1.838, p<0.001].

Conclusions: Regardless of mental status, avoidant and depressive styles were the most prevalent in this older adult sample. Main protective factor in all subgroups was the ability to enjoy free time, whereas the main risk factors were being female and current or past history of mental disorder.

INTRODUCTION

Since the declaration of the coronavirus disease 2019 (COVID-19) pandemic and lockdown, the older adult Spanish population has been isolated with the aim of shielding this vulnerable and multimorbid group and preventing overburdened health systems from collapsing, as large scale studies confirm that illness severity and mortality rates are significantly higher in patients over 60 years of age.[1] Indeed, deaths in that age group account for 81% of total COVID-19 deaths.[2-4]

The social isolation to which this population is being subjected is a great public health concern because many of them have their only social contact outside the home (e.g., daycare facilities, community and social centers, and places of worship). In fact, those who lack close family or friends and who rely on the support of volunteer services or social services have an exacerbated risk.[5] In older people with mental health problems, worry can both exacerbate and be exacerbated by preexisting psychiatric disorders, and isolation and contagion-prevention strategies may also increase the risk of loneliness and withdrawal in these susceptible individuals. Furthermore, those who become infected may experience the dual stigma associated with their contagion and their mental disorder.[6]

Evidence from the 2003 SARS epidemic found that suicide rates spiked in older adults during that outbreak.[7] Feelings of being a burden to their families, social disengagement, mental stress, and anxiety were closely related to that spike.[8] Surprisingly, older adults demonstrated better emotional regulation skills than their younger counterparts, reacting to the SARS epidemic with less anger and more adaptable coping strategies to that changing environment.[9]

These findings highlight the urgent need to study the mental health consequences of COVID-19 in real time, so that its adverse effects can be anticipated and minimized.[10]

To our knowledge, most of the scientific literature related to this outbreak focuses on epidemiology and the clinical characteristics of infected patients, the scope of the disease in the general population, and its challenges for global health guidance. However, there are no research articles investigating the psychological correlates associated with COVID-19 in the aging population.

Hence, the present study is the first to examine the early psychological consequences of this pandemic in an older sample in Spain within the first two weeks of lockdown. The main objectives of this research are to ascertain the early psychological correlates of the COVID-19 pandemic in a Spanish sample aged 60 years or over and to determine if a current or past personal history of mental disorder influences those correlates. We hypothesize that the COVID-19 pandemic and lockdown will cause greater distress in older adults who have or have had a history of psychiatric disorders.

METHODS

Participants

Cross-sectional online survey designed to assess the early psychological correlates associated with the COVID-19 outbreak and lockdown in the general population living in Spain aged 18 years or over, conducted between March 19 and 26. Procedures for the complete study are described in the detail elsewhere.[11]

The total older adult subsample consists of 2194 individuals [mean age (SD) = 65.62 (5.05); females: 1198 (54.6%)]. The only exclusion criterion was not providing online informed consent.

The study was conducted according to the ethical principles of the Declaration of Helsinki.[12] The Clinical Research Ethics Committee of Hospital Universitario Central de Asturias in Oviedo approved the study protocol (Ref. 2020.162) on March 16, and online informed consent was obtained from all participants before enrollment.

Assessment

The survey consisted of an *ad hoc* questionnaire as well as the Spanish versions of the Depression, Anxiety, and Stress Scale (DASS-21)[13] and the Impact of Event Scale (IES).[14]

The DASS-21 and IES were used to measure the early psychological correlates associated with the COVID-19 pandemic and lockdown (last seven days). The DASS-21 is a 21-item self-rated scale developed to assess symptoms of depression, anxiety, and stress. The IES is a 15-item self-report scale to assess subjective distress related to a specific event. The IES provides a total score and scores for two additional subscales, intrusion and avoidance. Total scores and subscores were used for the data analysis. Additionally, dichotomous score variables ("not a case" scores 0-3 / "a probable case" scores > 4) for the five DASS-21 and IES subscales were also analyzed (for detailed information, see[11]).

Statistical analysis

Data were analyzed using IBM SPSS 24.0 (IBM Corp., Armonk, NY).[15] Data are presented as mean [standard deviation (SD)] for numeric variables and as frequencies and percentages for categorical variables. The comparison between groups was carried out using an exploratory chi-square test and a Fisher's exact test to establish the statistically different groups on the categorical variables and a one-way ANOVA with a Duncan post-hoc analysis on the continuous variables. The level of linear association between quantitative DASS-21 and IES scores was determined by Pearson's correlation coefficient. Five logistic regression models (forward stepwise selection) were estimated to determine the independent factors associated with being "a probable case" using dichotomous scores on the DASS-21 and IES subscales. A multinomial logistic regression model (main effects model) was used to determine factors associated with a

personal history of mental disorder (current or past; "no lifetime history of mental disorder" was used as the category of reference). The level of statistical significance was set at $\alpha = 0.05$ (two-tailed).

RESULTS

The final sample included 2194 individuals aged 60 years or over [mean age (SD) = 65.62 (5.05); females: 1198 (54.6%)]. Sociodemographic and clinical characteristics of the total sample are described in Table 1.

Factors related to the psychological correlates associated with the COVID-19 pandemic and lockdown

The psychological correlates associated with the COVID-19 pandemic and lockdown in the total sample are described in Table 2. It is noteworthy that 25.6% of the sample could be considered as having symptoms of depression, 3.6% of anxiety, and 11% of stress, according to the DASS-21. On the IES, the avoidant coping style was the most prevalent (32.1%), while the intrusive style was found in 14.2% of the total sample.

It is also worthy of note that all DASS-21 and IES scores and subscores were highly correlated (Pearson's correlation coefficients ranging from 0.269 to 0.860, $p < 0.001$ in all cases). In order to avoid multicollinearity, these scores were not included as independent variables in the logistic regression models.

Three different logistic regression models were run in order to assess variables (sociodemographic and clinical) associated with DASS-21 depression, anxiety, and stress symptoms (Table 3 and Supplementary Table 1). Ability to enjoy free time was a protective factor for the three kinds of symptoms. However, having a current mental disorder was found to be a risk factor for all DASS-21 symptoms. Other protective variables associated with DASS-21 depressive symptoms were being never married, a

civil servant, or retired. However, risk factor variables were female sex, having family/friends infected with COVID-19, and having a past (but not current) history of mental disorders. Another protective variable associated with DASS-21 anxiety symptoms was young age, while being female and having COVID-19 symptoms for more than fourteen days were risk factors for anxiety symptoms. Finally, being retired was protective against stress symptoms and having an older adult dependent and a past history of mental disorder were risk factors.

Two additional different regression models were carried out to assess variables associated with IES coping styles (Table 3 and Supplementary Table 2). Being female and having a current mental disorder were risk factors for both coping styles. However, ability to enjoy free time was a protective factor for intrusive style. Finally, other risk factors for avoidant style were primary or secondary education level and a past history of mental disorder. On the other hand, an income higher than €1999 and having one or two dependent children were protective factors for avoidant style.

Importance of past or current history of mental disorder in psychological correlates associated with the COVID-19 pandemic and lockdown

As can be seen in Table 1, 1690 individuals (77% of the total sample) reported never having been diagnosed with a mental disorder (NMD), 342 (15.6%) reported a past (but not current) mental disorder (PMD), and 162 (7.4%) reported a current mental disorder (CMD). In short (Table 1), people with a PMD or CMD were younger than NMD, were more frequently female, also differed in marital status (less frequently married or living as married and more frequently separated/divorced or widowed), in living situation (more frequently living alone and less frequently living with one other person), and they more frequently had a current physical disease. On the other hand, people with a CMD differed from NMD or PMD in education level (more frequently had a secondary

education and less frequently a higher education level), work status (more frequently a student or homemaker), income (€) (in general, lower incomes), more frequently had an older adult dependent, had less ability to enjoy free time, and tended to have days with COVID-19 symptoms.

On the DASS-21 (Table 2), in the three groups, the most prevalent symptoms were depression (NMD = 21.5%, PMD = 33.3%, CMD = 51.9%), with anxiety being the least prevalent (NMD = 2.0%, PMD = 5.3%, CMD = 17.3%). The percentage of people having depression, anxiety, and stress symptoms significantly differed in the three groups and was higher in those with CMD and lower in those with NMD. On the IES (Table 2), the avoidant coping style was the most prevalent (NMD = 29.3%, PMD = 37.4%, CMD = 50.0%). Also the possibility of having intrusive or avoidant coping styles significantly differed in the three groups and was higher in those with CMD and lower in those with NMD.

A multinomial regression analysis was conducted in order to determine if a personal history of mental disorder (current or past) could differently influence the psychological correlates associated with the COVID-19 pandemic and lockdown. All the variables that were statistically significant in the bivariate analysis were included in the model (see Table 2 and 3). The analysis shows that there are no differences between NMD and PMD in DASS-21 or IES psychological correlates. However, CMD is associated with higher scores on the DASS-21 for anxiety [$\beta = 0.609$, OR = 1.838; 95% CI = 1.400-2.413), $p < 0.001$] (Table 4).

DISCUSSION

To our knowledge, this is the first study exploring the early psychological correlates associated with the COVID-19 pandemic and lockdown in a Spanish older adult sample and ascertaining the influence of past or current mental disorder on those correlates. We

describe the differential psychological reactions – in terms of depression, anxiety, and stress symptoms together with avoidant and intrusive coping styles – displayed by the older sample aged 60 years and over during strict lockdown.

Note that after examining odds ratio (OR) values, the magnitude of the strength of association tends to be insignificant (OR < 1.68) or small (OR values between 1.68 and 3.47) in most cases, and only variables such as "being able to enjoy free time" or "current mental disorder" achieved associations of medium (OR values between 3.48-6-71) or large (OR > 6.71) strength.[16] However, all associations have been included in the Discussion, as we felt this could be of potential theoretical interest. On the other hand, due to the scarcity of studies exclusively examining older adult populations, throughout the Discussion, these studies are mentioned alongside studies that examined mixed populations of all ages, which could limit the generalizability of conclusions.

Factors related to the psychological correlates associated with the COVID-19 pandemic and lockdown

Anxiety and stress reactions were prominent in a recent study carried out in populations of all ages during the COVID-19 outbreak[17] and other traumatic events, such as the Wenchuan earthquake, in the Chinese older adult population.[18] Surprisingly, neither anxiety nor stress was the most prevalent in our sample. In contrast, depressive and avoidant coping styles were the most prevalent, regardless of mental health status. Both depression and avoidance reactions have been closely associated with chronic stress coping strategies in the older adults.[19] This affective reaction has been found in life-threatening stressful events, although the specific impact on older people has yet to be determined, as prior studies have usually been conducted in a general population of different ages.[20] The importance of culture, social activities, and family structure, that is, family support and closeness, are values deeply entrenched in Spanish society, so the

lack of contact and the restrictions imposed by the strict lockdown could be one plausible explanation for the affective reaction of our sample. Furthermore, there may be less anxiety in the Spanish population overall, as compared to populations without access to universal healthcare, due to not having to worry about access to treatment and/or financial devastation should they require costly or prolonged treatment.

Concerning sociodemographic factors, being female increased the likelihood of poorer outcomes (depression or anxiety symptoms as well as intrusive or avoidant coping styles). Data are consistent with previous studies in which older adult females had an increased risk of completed suicide, as well as higher rates of depression and anxiety after the 2003 SARS epidemic in Hong Kong[7, 21, 22] and natural disasters, which may be extrapolable to the current life-threatening event.[23, 24]

Another sociodemographic risk factor associated with dysfunctional coping styles (avoidant style) was lower education level (primary or secondary). Prior data suggest an association between this variable and avoidance symptoms in the adult population after the SARS epidemic[22] or post-traumatic stress disorder in older adult survivors of the 2008 earthquake in China.[24, 25]

In our sample, having an older adult dependent has emerged as a risk factor for stress symptoms. However, having one or two dependent children was found to be a protective factor against avoidant coping style. It has been previously suggested, in general populations of all ages, that being a caregiver is stressful and has negative implications for the mental health and well-being of caregivers.[26] We would like to point out that, in our sample, subjects with and without dependents (children or older adults) had no differences in monthly incomes. However, the discrepancy in our finding could be due to the fact that the older adults are a population especially vulnerable to severe COVID-19 while, by contrast, children are a lower risk population.

Younger age and being a civil servant or retired have been found to be protective factors for depressive, anxiety, or stress symptoms. However, income higher than 1,999 euros was a protective factor against avoidant coping style. It should be noted that the COVID-19 outbreak and lockdown has increased job instability in Spain. After the SARS outbreak in 2003, the variable that showed the highest correlation with developing a psychological disorder was income reduction.[27] Therefore, at least in general populations of all ages, stability of earnings is one of the most important variables, and the effects on people whose income does not fluctuate may be less. It is noteworthy that, in Spain, civil servants and pensioners have guaranteed incomes, so they may be less concerned about their finances, as they remain stable, explaining at least in part the protective association of this factor against depressive symptoms. On the other hand, a study in victims of the Great East Japan Earthquake and Tsunami showed that older groups (75 years or more versus 65-74) experienced higher levels of psychological distress and feelings of hopelessness.[28] It also should be noted that, in Spain, the current retirement age is around 65-67 years, so the youngest participants in our sample could still be actively working and affected by job and economic consequences of the pandemic.

The ability to enjoy free time has been found to be a protective factor for the different explored outcomes. Evidence suggests that, at least in general populations of all ages, engaging in positive activities improves the ability to cope with stressful experiences and decreases the probability of developing a mental disorder.[29] Moreover, it has been shown that more active older adults have greater resilience and better mental health than those who are sedentary.[30]

From a clinical point of view, having COVID-19 symptoms for more than fourteen days or having family or friends infected with COVID-19 are associated with anxiety or

depression, respectively. With respect to the association between having COVID-19 symptoms and anxiety, it is important to note that, in the present sample, there is a clear discrepancy between the percentage of subjects who reported COVID-19 symptoms (defined as fever, cough, tiredness, expectoration, muscle pain, headache, or diarrhea) and those who were tested and/or had a positive result, mainly related to the shortage of PCR and antibody tests in our country at the beginning of the pandemic. On the other hand, prior data suggest that people who personally knew someone who had SARS were more likely to be affected by depressive symptoms.[22]

Importance of past or current history of mental disorder in psychological correlates associated with the COVID-19 pandemic and lockdown

In our sample, having a current or past mental disorder increased the likelihood of poorer outcomes. Due to the COVID-19 pandemic, older adult people may experience fear of getting sick and sadness, and the lockdown has also caused interpersonal isolation and an absence of social and family contact. Furthermore, the COVID-19 pandemic is strikingly affecting mental health, with an increased incidence of psychiatric symptoms in the general population and exacerbations in those with pre-existing mental disorders.[31]

Most of our total sample reported that they had never been diagnosed with mental disorder. In general, participants with a history of past or current mental disorder were younger, mostly female, with a lower educational level, and smaller income, had an older adult dependent, had less ability to enjoy spare time, and more frequently had physical comorbidities. Having a chronic physical disease is an important stress factor, as physical health is closely related to mental wellness. Given that patients with mental disorders have higher rates of comorbidity, they appear to constitute an ultra-high risk population that has been partially disregarded during this pandemic in other countries.[32]

Depressive symptoms and avoidant coping style were the most prevalent early psychological consequences in people with mental disorders, with anxiety symptoms being the least prevalent.

In short, after running multinomial regression logistic models, people with a history of mental disorder (current or past) were mostly female, younger, had a more unstable financial situation, had an older adult dependent, and had fewer current physical comorbidities than those without a lifetime psychiatric diagnosis. In line with previous studies, having a current mental disorder conferred a risk of intrusive thoughts. Unexpectedly, our results reflect no differences in early psychological correlates in people with a past or no lifetime mental disorders, as has been found when studying populations of all ages.[33]

Regarding specific COVID-19 variables, we have not found differential correlates in our sample, but this may be due to the small number in the sample affected directly or indirectly by the coronavirus at the time of the evaluation.

Some limitations arise from the inherent methodology of the study. The first limitation is the online snowball recruitment strategy that was used instead of random selection, which excluded older adults who did not use new technologies, thus preventing conclusions that could be entirely extrapolated to the general population. Secondly, the questionnaires were self-administered, and symptoms were self-reported; thus they should be interpreted very cautiously, as a clinical examination would be needed in order to establish a reliable diagnosis. In any event, ongoing events made that task impractical and unworkable. Thirdly, the cross-sectional design of the study did not allow us to obtain information to detect changes in mental health and coping methods over time. Fourthly, discrepancies between the percentage of subjects having COVID-19 symptoms and the number tested or with a positive result could also limit the

generalization of results. However, we would like to point out that the main objective of the study is "to examine the early psychological consequences of the COVID-19 pandemic and lockdown" and not the consequences of being infected with COVID-19. Fifthly, it is noteworthy that the very large number of statistical hypotheses shown could greatly inflate the chance of a type I error rate. Finally, studies examining older adult populations were mentioned alongside studies that examined populations of all ages, limiting the generalizability of the discussed results. However, we would emphasize the non-restrictive inclusion and exclusion criteria and the large sample size of the study.

CONCLUSIONS

This research constitutes one of the first attempts at understanding the early

psychological reactions to the COVID-19 pandemic and lockdown in the older adult

population. Regardless of mental status, avoidant and depressive styles were the most

prevalent in this older adult sample. The main protective factor in all subgroups was the

ability to enjoy free time, whereas the main risk factors were female sex and current or

past history of mental disorder. The lack of association with specific variables

associated with COVID-19 may be explained by the small number of people affected in

the first few days. This is an early correlates study, and those effects could be visible in

subsequent investigations. In keeping with a recent claim,[34] our findings may contribute

to promoting timely tailored interventions to alleviate dysfunctional coping strategies in

future epidemics.

DISCLOSURE / CONFLICTS OF INTEREST

None

AUTHOR CONTRIBUTIONS

LG-A, LF-T, MPG-P, PAS, and JB designed the study. All authors reviewed it, gave approvals, and acquired the data. PAS, MPG-P, and JB conducted statistical analyses. MTBB, AV, CMC, CPD, and PAS wrote the first draft of the manuscript. All authors reviewed all drafts and gave the final approval.

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TABLE 1. Sociodemographic and clinical characteristics for the total sample and by mental state of the participants

	Population 60+ N = 2,194	Never mental disorder group[1] N = 1,690	Past mental disorder group[2] N = 342	Current mental disorder group[3] N = 162	Statistical test [df]
Sociodemographic variables					
Age [Mean (SD)]	65.62 (5.05)	65.94 (5.12)	64.70 (4.44)	64.29 (5.14)	14.943[a] [2], [2191]****
Gender [n (%)]					42.894[b] [2] ****
Female	1198 (54.6)	859 (50.8)	226 (66.1)	113 (69.8)	1≠2[c]****&3[c]****
Male	996 (45.4)	831 (49.2)	116 (33.9)	49 (30.2)	
Marital status [n (%)]					34.932[b] [4] ****
Never married	212 (9.7)	166 (9.8)	31 (9.1)	15 (9.3)	1=2=3[c]
Married/Living as married	1529 (69.7)	1222 (72.3)	208 (60.8)	99 (61.1)	1≠2[c]****&3[c]***, 2≠3[c]****
Separated/Divorced/Widowed	453 (20.6)	302 (17.9)	103 (30.1)	48 (29.6)	1≠2[c]****&3[c]****
Education level [n (%)]					20.794[b] [4] ****
Primary	83 (3.8)	65 (3.8)	8 (2.3)	10 (6.2)	2≠3[c]*
Secondary	624 (28.4)	464 (27.5)	93 (27.2)	67 (41.4)	1≠3[c]****, 2≠3[c]***
Higher	1487 (67.8)	1161 (68.7)	241 (70.5)	85 (52.5)	1≠3[c]****, 2≠3[c]***
Work status [n (%)]					28.694[b] [12] ***
Unemployed	72 (3.3)	54 (3.2)	13 (3.8)	5 (3.1)	1=2=3[c]
Working					
Employed	206 (9.4)	154 (9.1)	32 (9.4)	20 (12.3)	1=2=3[c]
Self-employed	215 (9.8)	184 (10.9)	21 (6.1)	10 (6.2)	1≠2[c]**
Civil servant	383 (17.5)	281 (16.6)	73 (21.3)	29 (17.9)	1≠2[c]*
Retired	1173 (53.5)	908 (53.7)	184 (53.8)	81 (50.0)	1=2=3[c]
Student/Homemaker	40 (1.8)	26 (1.5)	5 (1.5)	9 (5.6)	1≠3[c]***, 2≠3[c]*
Other	105 (4.8)	83 (4.9)	14 (4.1)	8 (4.9)	1=2=3[c]
Income (€/month) [n (%)]					45.520[b] [12]****
No income	69 (3.1)	56 (3.3)	4 (1.2)	9 (5.6)	1≠2[c]*, 2≠3[c]*
Less than 500	50 (2.3)	44 (2.6)	1 (0.3)	5 (3.1)	1≠2[c]***, 2≠3[c]*
500-999	163 (7.4)	125 (7.4)	25 (7.3)	13 (8.0)	1=2=3[c]
1000-1499	264 (12.0)	185 (10.9)	43 (12.6)	36 (22.2)	1≠3[c]***, 2≠3[c]**
1500-1999	455 (20.7)	335 (19.8)	86 (25.1)	34 (21.0)	1≠2[c]*
More than 1999	999 (45.5)	789 (46.7)	158 (46.2)	52 (32.1)	1≠3[c]****, 2≠3[c]***
Prefer not to answer	194 (8.8)	156 (9.2)	25 (7.3)	13 (8.0)	1=2=3[c]
Change in work status due to COVID-19 [n (%)]					5.730[b] [6]
No	2075 (94.6)	1599 (95.1)	328 (96.2)	148 (91.9)	1=2=3[c]
ETLA/EPLO	45 (2.1)	35 (2.1)	5 (1.5)	5 (3.1)	1=2=3[c]
Termination	5 (0.2)	4 (0.2)	1 (0.3)	0 (0.0)	1=2=3[c]
Furlough	59 (2.7)	44 (2.6.)	7 (2.1)	8 (5.0)	1=2=3[c]
Change in income due to COVID-19 [n (%)]					10.089[b] [8]
No	1855 (84.5)	1418 (83.9)	296 (86.5)	141 (87.0)	1=2=3[c]
Reduction, ≤25%	109 (5.0)	81 (4.8)	20 (5.8)	8 (4.9)	1=2=3[c]
Reduction, 26-50%	121 (5.5)	98 (5.8)	18 (5.3)	5 (3.1)	1=2=3[c]
Reduction, 51-100%	104 (4.7)	89 (5.3)	8 (2.3)	7 (4.3)	1≠2[c]*
Increase	5 (0.2)	4 (0.2)	0 (0.0)	1 (0.6)	1=2=3[c]
Living situation [n (%)]					35.882[b] [6]****
Alone	445 (20.3)	301 (17.8)	103 (30.1)	41 (25.3)	1≠2[c]****&3[c]*
With one other person	1183 (53.9)	944 (55.9)	169 (49.4)	70 (43.2)	1≠2[c]*&3[c]***
With two to four	540 (24.6)	423 (25.0)	68 (19.9)	49 (30.2)	1≠2[c]*, 2≠3[c]*
With more than four	26 (1.2)	22 (1.3)	2 (0.6)	2 (1.2)	1=2=3[c]
Dependent children [n (%)]					3.426[b] [6]
None	1730 (78.9)	1333 (78.9)	269 (78.7)	128 (79.0)	1=2=3[c]
One	263 (12.0)	197 (11.7)	43 (12.6)	23 (14.2)	1=2=3[c]

Two	159 (7.2)	124 (7.3)	26 (7.6)	9 (5.6)	1=2=3^c
More than two	42 (1.9)	36 (2.1)	4 (0.2)	2 (0.1)	1=2=3^c
Older adult dependents [n (%)]					19.985^b [4]****
None	1884 (85.9)	1460 (86.4)	302 (88.3)	122 (75.3)	1≠3^{c****}, 2≠3^{c****}
One	242 (11.0)	178 (10.5)	35 (10.2)	29 (17.9)	1≠3^{c**}, 2≠3^{c*}
More than one	68 (3.1)	52 (3.1)	5 (1.5)	11 (6.8)	1≠3^{c*}, 2≠3^{c***}
Able to enjoy free time [n (%)]					29.861^b [2]****
No	68 (3.1)	38 (2.3)	14 (4.1)	16 (9.9)	1≠3^{c****}, 2≠3^{c*}
Yes	2122 (96.7)	1648 (97.7)	328 (95.9)	146 (90.1)	
March survey response day [n (%)]					15.329^b [14]
19	671 (30.6)	524 (31.0)	96 (28.1)	51 (31.5)	1=2=3^c
20	498 (22.7)	394 (23.3)	74 (21.6)	30 (18.5)	1=2=3^c
21	188 (8.6)	136 (8.0)	36 (10.5)	16 (9.9)	1=2=3^c
22	128 (5.8)	86 (5.1)	30 (8.8)	12 (7.4)	1≠2^{c*}
23	84 (3.8)	66 (3.9)	12 (3.5)	6 (3.7)	1=2=3^c
24	25 (1.1)	20 (1.2)	3 (0.9)	2 (1.2)	1=2=3^c
25	133 (6.1)	104 (6.2)	23 (6.7)	6 (3.7)	1=2=3^c
26	467 (21.3)	360 (21.3)	68 (19.9)	39 (24.1)	1=2=3^c
Physical disease and COVID-19 variables					
Current physical disease# [n (%)]					12.759^b [2]***
No	876 (48.9)	716 (50.9)	123 (43.9)	37 (35.2)	1≠2^{c*}&3^{c***}
Yes	917 (51.1)	692 (49.1)	157 (56.1)	68 (64.8)	
Days with COVID-19 symptoms [n (%)]					18.795^b [8]*
None	2083 (94.9)	1612 (95.4)	327 (95.6)	144 (88.9)	1≠3^{c***}, 2≠3^{c**}
One or two days	41 (1.9)	28 (1.7)	6 (1.8)	7 (4.3)	1≠3^{c*}
Three to five	21 (1.0)	16 (0.9)	2 (0.6)	3 (1.9)	1=2=3^c
Six to fourteen	38 (1.7)	29 (1.7)	4 (1.2)	5 (3.1)	1=2=3^c
More than fourteen	11 (0.5)	5 (0.3)	3 (0.9)	3 (1.9)	1≠3^{c*}
COVID-19 test taken [n (%)]					2.262^b [6]
No	2168 (98.8)	1672 (99.0)	336 (98.2)	160 (98.8)	1=2=3^c
Yes, negative results	11 (0.5)	7 (0.4)	3 (0.9)	1 (0.6)	1=2=3^c
Yes, positive results	9 (0.4)	6 (0.4)	2 (0.6)	1 (0.6)	1=2=3^c
Yes, waiting for results	5 (0.2)	4 (0.2)	1 (0.3)	0 (0.0)	1=2=3^c
Family/Friends infected with COVID-19 [n (%)]					9.195^b [6]
None	1752 (79.9)	1343 (79.7)	272 (79.8)	137 (85.6)	1=2=3^c
One	198 (9.0)	154 (9.1)	28 (8.2)	16 (10.0)	1=2=3^c
Two	121 (5.5)	100 (5.9)	18 (5.3)	3 (1.9)	1≠3^{c*}
More than two	116 (5.3)	89 (5.3)	23 (6.7)	4 (2.5)	1≠3^{c*}
Living with people infected with COVID-19 [n (%)]					0.859^b [2]
No	2155 (98.2)	1658 (98.1)	338 (98.8)	159 (98.1)	1=2=3^c
Yes	39 (2.8)	32 (1.9)	4 (1.2)	3 (1.9)	

Notes: ^{a}ANOVA F-test (Duncan post-hoc: people without a lifetime mental disorders are significantly older than the other two groups, which do not differ from each other); ^{b}Chi-square test; ^{c}Fisher's exact test; ETLA: Employee Temporary Layoff. EPLO: Employee Permanent Layoff; #Physical disease includes: Hypertension, diabetes, cardiovascular disease, respiratory disease (asthma, COPD, etc.), and cancer; df: Degrees of freedom; SD: Standard Deviation; NS: Not significant; *p < 0.05; **p < 0.01; ***p < 0.005; ****p < 0.001.

TABLE 2. Psychological correlates associated with the COVID-19 pandemic and the lockdown for the total sample and by mental state of the participants

	Population 60+ N = 2,194	Never mental disorder group (NMD) N = 1,690	Past mental disorder group (PMD) N = 342	Current mental disorder group (CMD) N = 162	Statistical test [df]
DASS-21 subscales [Mean (SD)]					
Depression	3.2 (0.94)	3.11 (0.91)	3.39 (0.88)	3.70 (1.18)	39.473[a] [2], [2191]****
Anxiety	0.6 (1.10)	0.44 (0.90)	0.67 (1.20)	1.72 (1.86)	110.646[a] [2], [2191]****
Stress	1.1 (1.72)	0.88 (1.53)	1.16 (1.84)	2.60 (2.40)	81.131[a] [2], [2191]****
DASS-21 subscales [n (%)]					
Depression					138.783[b][10]****
No	85 (3.9)	73 (4.3)	6 (1.8)	6 (3.7)	1≠2[c]*
Doubtful	1548 (70.6)	1254 (74.2)	222 (64.9)	72 (44.4)	1≠2[c]***&3[c]****, 2≠3[c]****
Mild	402 (18.3)	281 (16.6)	78 (22.8)	43 (26.5)	1≠2[c]**&3[c]***
Moderate	114 (5.2)	52 (3.1)	30 (8.8)	32 (19.8)	1≠2[c]***&3[c]****, 2≠3[c]***
Severe	37 (1.7)	25 (1.5)	4 (1.2)	8 (4.9)	1≠3[c]**, 2≠3[c]*
Extremely severe	8 (0.45)	5 (0.3)	2 (0.6)	1 (0.6)	1=2=3[c]
Depression					84.487[b] [2]****
No	1633 (74.4)	1327 (78.5)	228 (66.7)	78 (48.1)	1≠2[c]****&3[c]****, 2≠3[c]***
Yes	561 (25.6)	363 (21.5)	114 (33.3)	84 (51.9)	
Anxiety					210.174[b] [10]****
No	1910 (87.1)	1525 (90.2)	292 (85.4)	93 (57.4)	1≠2[c]*&3[c]****, 2≠3[c]****
Doubtful	204 (9.3)	131 (7.8)	32 (9.4)	41 (25.31)	1≠3[c]****, 2≠3[c]****
Mild	42 (1.9)	25 (1.5)	10 (2.9)	7 (4.3)	1≠3[c]*
Moderate	23 (1.0)	4 (0.2)	6 (1.8)	13 (8.0)	1≠2[c]***&3[c]****, 2≠3[c]***
Severe	9 (0.4)	3 (0.2)	1 (0.3)	5 (3.1)	1≠3[c]****, 2≠3[c]*
Extremely severe	6 (0.3)	2 (0.1)	1 (0.3)	3 (1.9)	1≠3[c]**
Anxiety					101.153[b] [2]****
No	2114 (96.4)	1656 (98.0)	324 (94.7)	134 (82.7)	1≠2[c]***&3[c]****, 2≠3[c]****
Yes	80 (3.6)	34 (2.0)	18 (5.3)	28 (17.3)	
Stress					150.109[b] [10]****
No	1631 (74.3)	1310 (77.5)	251 (73.4)	70 (43.2)	1≠3[c]****, 2≠3[c]****
Doubtful	322 (14.7)	242 (14.3)	48 (14.0)	32 (19.8)	1=2=3[c]
Mild	87 (4.0)	53 (3.1)	16 (4.7)	18 (11.1)	1≠3[c]****, 2≠3[c]*
Moderate	66 (3.0)	42 (2.5)	9 (2.6)	15 (9.3)	1≠3[c]****, 2≠3[c]***
Severe	53 (2.4)	28 (1.7)	10 (2.9)	15 (9.3)	1≠3[c]****, 2≠3[c]***
Extremely severe	35 (1.6)	15 (0.9)	8 (2.3)	12 (7.4)	1≠2[c]*&3[c]****, 2≠3[c]*
Stress					127.068[b] [2]****
No	1953 (89.0)	1552 (91.8)	299 (87.4)	102 (63.0)	1≠2[c]*&3[c]****, 2≠3[c]****
Yes	241 (11.0)	138 (8.2)	43 (12.6)	60 (37.0)	
IES subscales [Mean (SD)]					
Intrusion	1.58 (1.74)	1.44 (1.64)	1.78 (1.82)	2.64 (2.14)	39.279[a] [2], [2191]****
Avoidance	2.66 (1.86)	2.53 (1.82)	2.94 (1.87)	3.53 (2.02)	26.446[a] [2], [2191]****
Total IES	4.25 (3.06)	3.97 (2.91)	4.72 (3.17)	6.17 (3.56)	45.012[a] [2], [2191]****
IES subscales [n (%)]					
Intrusion					69.579[b] [2]****
No	1882 (85.8)	1493 (88.3)	284 (83.0)	105 (64.8)	1≠2[c]**&3[c]****, 2≠3[c]****
Yes	312 (14.2)	197 (11.7)	58 (17.0)	57 (35.2)	
Avoidance					34.115[b] [2]****
No	1489 (67.9)	1194 (70.7)	214 (62.6)	81 (50.0)	1≠2[c]**&3[c]****, 2≠3[c]**
Yes	705 (32.1)	496 (29.3)	128 (37.4)	81 (50.0)	

Notes: [a]ANOVA F-test (Duncan post-hoc: on all subscales, the three groups differ significantly from each other); [b]Chi-square test; [c]Fisher's exact test; DASS-21: Depression, Anxiety, and Stress Scale (No: includes No and Doubtful; Yes: includes Mild, Moderate, Severe, and Extremely Severe); IES: Impact of Event Scale;

df: Degrees of freedom; SD: Standard Deviation; NS: Not significant; $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.005$; $^{****}p < 0.001$.

TABLE 3. Factors related to psychological correlates associated with of the COVID-19 pandemic and lockdown.

	DASS-21			IES	
	Depression	Anxiety	Stress	Intrusion	Avoidance
	OR (95% CI)*	OR (95% CI)*	OR (95% CI)*	OR (95% CI)*	O.R. (95% CI)*
Sociodemographic variables					
Age		0.876 (0.800-0.960)			
Gender, reference: Male					
Female	2.004 (1.559-2.575)	3.320 (1.511-7.294)		2.065 (1.507-2.830)	1.683 (1.351-2.096)
Marital status, reference: Separated/ Divorced/Widowed					
Never married	0.665 (0.456-0.970)				
Married/Living as married					
Education, reference: Higher					
Primary					2.204 (1.227-3.960)
Secondary					1.323 (1.031-1.697)
Work status, reference: Unemployed					
Employed					
Self-employed					
Civil servant	0.530 (0.293-0.957)				
Retired	0.539 (0.311-0.934)		0.352 (0.170-0.729)		
Student/Homemaker					
Income (€/month), reference: No income					
500-999					
1000-1499					
1500-1999					
More than 1999					0.513 (0.293-0.900)
Dependent children, reference: No					
One					
Two					0.526 (0.338-0.820)
More than two					0.342 (0.128-0.914)
Older adult dependents, reference: No					
One					
Two			2.655 (1.206-5.849)		
More than two					
Able to enjoy free time, reference: No					
Yes	0.268 (0.148-0.488)	0.103 (0.047-0.227)	0.101 (0.055-0.186)	0.208 (0.114-0.377)	

|					
Physical disease and COVID-19 variables					
Days with COVID-19 symptoms, reference: None					
One or two days					
Three to five					
Six to fourteen					
More than fourteen		7.584 (1.398-41.146)			
Family/Friends infected with COVID-19, reference: No					
Yes	1.631 (1.247-2.132)				
Psychological variables					
Mental disorder, reference: No lifetime					
Past mental disorder (PMD)	1.810 (1.352-2.423)		1.641 (1.080-2.493)		1.374 (1.040-1.814)
Current mental disorder (CMD)	3.132 (2.043-4.803)	6.202 (3.005-12.799)	4.743 (2.918-7.710)	2.249 (1.381-3.662)	1.755 (1.154-2.669)

Notes: *All entries were tested with Wald chi-square, degrees of freedom (df) = 1; DASS-21: Depression, Anxiety, and Stress Scale; IES: Impact of Event Scale; OR: Odds ratio; CI: Confidence interval.

TABLE 4. Variables associated with personal history of mental disorder (current or past) versus no lifetime history of mental disorder

	β	SE	Wald	Df	p	OR	95% CI
Current mental disorder (CMD)							
Intersection	4.393	2.754	2.545	1	0.111		
DASS-21 Depression	0.043	0.173	0.063	1	0.802	1.044	0.744-1.467
DASS-21 Anxiety	0.609	0.139	19.235	1	<0.001	1.838	1.400-2.413
DASS-21 Stress	0.165	0.120	1.885	1	0.170	1.179	0.932-1.491
IES Intrusion	-0.157	0.120	1.723	1	0.189	0.855	0.676-1.080
IES Avoidance	0.064	0.113	0.323	1	0.570	1.066	0.854-1.331
Age	-0.082	0.033	6.153	1	0.013	0.921	0.864-0.983
Gender (Male)	-0.534	0.267	3.998	1	0.046	0.586	0.347-0.990
Education level (primary)	-0.682	0.271	6.347	1	0.012	0.506	0.298-0.860
Income (€/month) (< 500)	-0.730	0.983	0.551	1	0.458	0.482	0.070-3.311
Older adult dependents (No)	-0.678	0.272	6.226	1	0.013	0.508	0.298-0.865
Current physical disease (No)*	-0.621	0.232	7.181	1	0.007	0.538	0.341-0.846
Survey response date							
March 21	0.143	0.442	0.105	1	0.746	1.154	0.485-2.747
March 22	0.306	0.462	0.440	1	0.507	1.139	0.549-3.360
Past mental disorder (PMD)							
Intersection	3.066	2.040	2.259	1	0.133		
DASS-21 Depression	0.158	0.122	1.675	1	0.196	1.172	0.922-1.489
DASS-21 Anxiety	-0.036	0.110	0.104	1	0.747	0.965	0.777-1.198
DASS-21 Stress	0.033	0.081	0.167	1	0.683	1.034	0.881-1.213
IES Intrusion	-0.015	0.072	0.045	1	0.831	0.985	0.854-1.135
IES Avoidance	0.046	0.071	0.416	1	0.519	1.047	0.911-1.203
Age	-0.093	0.021	19.665	1	<0.001	0.912	0.875-0.950
Gender (Male)	-0.406	0.154	6.969	1	0.008	0.666	0.493-0.901
Education level (primary)	-0.009	0.177	0.003	1	0.957	0.991	0.700-1.403
Income (€/month) (< 500)	-2.309	1.108	4.348	1	0.037	0.099	0.011-0.871
Older adult dependents (No)	0.104	0.214	0.233	1	0.629	1.109	0.729-1.689
Current physical disease (No)*	-0.347	0.138	6.287	1	0.012	0.707	0.539-0.927
Survey response date							
March 21	0.658	0.267	6.058	1	0.014	1.931	1.143-3.261
March 22	0.825	0.292	7.984	1	0.005	2.282	1.288-4.045
Chi-square (df) = 279.745 (84), p < 0.001							

Notes: DASS-21: Depression, Anxiety, and Stress Scale; IES: Impact of Event Scale; *Physical disease includes: Hypertension, diabetes, cardiovascular disease, respiratory disease (asthma, COPD, etc.), and cancer; SE: Standard error; df: Degrees of freedom; OR: Odds ratio; CI: Confidence interval.

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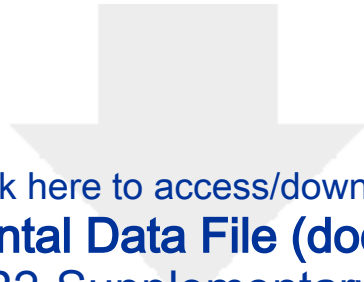
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