



ongoing crisis, such as COVID-19, is associated with the development of coping strategies and psychological management of the event but also tentatively with an exacerbation of mental illness in vulnerable people.

Even though we are all prone to stress in such a pandemic, aging itself has been considered a prominent risk factor for severe disease and death from COVID-19 [4-7], however, research is controversial regarding to the emotional response of older adults with some studies suggesting a risk for the emotional well-being [8] due to fear [9], difficulty in adapting to technologies and isolation [10-11] and, others observing that age was negatively associated with experiencing negative emotions [12] and, positively associated with a better emotional regulation and well-being when compared to younger adults [13]. In line with the above, research has also found that older age is related to less stress reactivity [14-15]. In addition, certain environmental variables have been postulated as risk (isolation, economic losses, use of anxiolytics) and protection factors (regular physical exercise) against emotional distress in older adults [16-20].

Nonetheless, contrary to what was expected, previous studies by our group found that older adults have shown less emotional distress when compared to younger population [21].

Based on this, more emphasis should be given to how older adults are perceiving, internalizing and assimilating the health and social crisis consequences of the pandemic in order to identify what emotions older adults are using to manage the COVID-19 outbreak.

To the best of our knowledge, previous published studies exploring the emotional profile of older adults in the worst moment of the initial outbreak of the pandemic are scarce. Therefore, the aims of the present study are first, to explore the differential presence of emotions among older people during the worst period of COVID-19 outbreak in Spain compared with those experienced by the youngest; and second, to study the relationship between the emotional state of older people and some both protective and risky environmental variables: practicing regular exercise, loneliness, economic losses and use of anxiolytics.

## METHODS

### Participants and procedure

A total of 150 participants over or equal 60 years old ( $\geq 60$ ) (40.7% male) and 1489 under 60 years old ( $< 60$ ) (31.0% male) participants compose this cross-sectional study based on a national online survey (PsyCOVID-SanJuan-imas12) carried out from March 29, 2020, to April 5, 2020, which covers the first peak of the SARS-CoV-2 infection in Spain. The questionnaire was administered applying an exponential non-discriminative snowball sampling. As part of the

circulation strategy, the questionnaire was published on the hospital website, advertised in the local media and distributed by social networks to different geographic regions in Spain. For the purposes of the present study, healthcare workers ( $n = 866$ ) as well as those with current or past mental illness reported ( $n = 205$ ) were not included as they constitute special vulnerable subgroups [22-25]. Informed consent was provided by all survey participants. The survey was anonymous, and confidentiality of information was assured. The study was approved by the local clinical research ethics committee.

### Measures

Sociodemographic information on age, gender and occupation was required in the survey, as well as whether participants presented regular practice of exercise, were experiencing loneliness, understood as the loss of usual accompaniment, were suffering of income loss due to the pandemic situation and/or if they needed to increase consumption of anxiolytic substances.

Following the methodology presented in a previous study by our group [26], participants were presented a list of emotional states (fear, hopelessness, sadness, uncertainty, hypochondria, irritability, intolerance, frustration, anger, and helplessness) and asked to select those that prevailed the most during this phase of the pandemic.

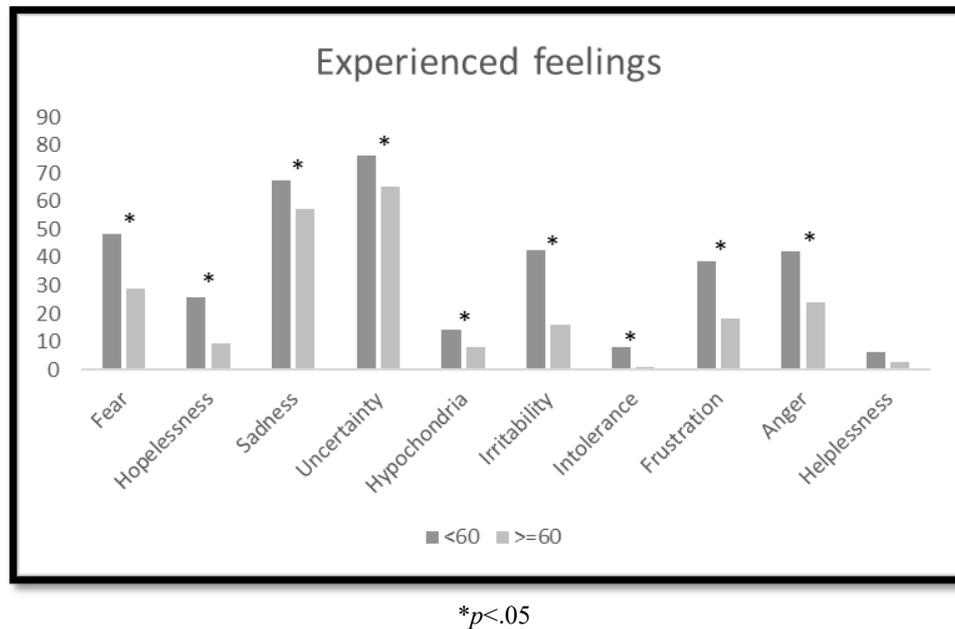
The objective was not to make a list based on a specific instrument, but rather a comprehensive list able to cover the different emotions that could arise in such a unique moment.

The presence/absence of each emotion was compared across groups using the Chi-squared test. P-values below 0.05 were considered statistically significant. The magnitude of the association was measured through Cramer's phi ( $\phi_c$ ).

## RESULTS

### Comparisons of the emotional state between people $\geq 60$ and $< 60$ years

For all negative emotions, percentages were higher in those under 60 years compared to people above 60 years (**Figure 1**). There was a small but significant association between age and the experience of fear ( $< 60y$  48.4%,  $\geq 60y$  28.7%;  $\chi^2(1) = 21.23$ ,  $p < .001$ ,  $\phi_c = .11$ ), hopelessness ( $< 60y$  25.9%,  $\geq 60y$  9.3%;  $\chi^2(1) = 20.33$ ,  $p < .001$ ,  $\phi_c = .11$ ), sadness ( $< 60y$  67.4%,  $\geq 60y$  57.3%;  $\chi^2(1) = 6.23$ ,  $p = .013$ ,  $\phi_c = .06$ ), uncertainty, ( $< 60y$  76.5%,  $\geq 60y$  65.3%;  $\chi^2(1) = 9.17$ ,  $p = .002$ ,  $\phi_c = .08$ ), hypochondria ( $< 60y$  14.2%,  $\geq 60y$  8.0%;  $\chi^2(1) = 4.49$ ,  $p = .034$ ,  $\phi_c = .05$ ), irritability ( $< 60y$  42.7%,  $\geq 60y$  16.0%;  $\chi^2(1) = 40.43$ ,  $p < .001$ ,  $\phi_c = .16$ ), intolerance ( $< 60y$  8.1%,  $\geq 60y$  0.7%;  $\chi^2(1) = 10.89$ ,  $p < .001$ ,  $\phi_c = .08$ ), frustration ( $< 60y$  38.8%,  $\geq 60y$  18.0%;  $\chi^2(1) = 25.36$ ,  $p < .001$ ,  $\phi_c = .12$ ), and anger ( $< 60y$  42.3%,  $\geq 60y$  24.0%;  $\chi^2(1) = 18.94$ ,  $p < .001$ ,  $\phi_c = .11$ ).



**Figure 1.** Comparison of the emotional state between people  $\geq 60$  and  $< 60$  years during the peak of the COVID-19 outbreak in Spain.

#### Associations between emotional state and physical exercise, loneliness, income loss and anxiolytic substances intake among the older group

The practice of exercise was not associated with the experience of any emotional state within the group of older groups; neither was associated experiencing loneliness with any of the emotions within the older group (all  $p > .05$ ). Nonetheless, having suffered of income loss appeared positively associated with anger ( $\chi^2(1) = 5.09, p = .024, \phi_c = .19$ ). Specifically, only those who suffer from income loss experienced anger (18%). Lastly, anxiolytic substance intake was associated with hopelessness ( $\chi^2(1) = 4.46, p = .035, \phi_c = .17$ ) and irritability ( $\chi^2(1) = 8.19, p = .004, \phi_c = .24$ ). Specifically, an increase in anxiolytic intake was observed in all those feeling hopelessness (8%) or irritability (13%).

#### DISCUSSION

The COVID-19 pandemic has become a unique stressor with a worldwide impact, leading some media to begin to compare it with the devastating 1918 Spanish flu. Research has confirmed that the greatest increase in mortality risk has been observed in patients over 60 years in all affected countries [27], especially in the initial moment. In addition, older adults have shown more severe complications, disruptions in daily routines and access to care and isolation during the pandemic [28]. Notwithstanding, studies from different countries have shown that despite the greater somatic vulnerability, the emotional consequences have not been as severe as expected compared to the younger population, at least during the first and so far, the worst peak of the COVID-19 pandemic [28-29]. Thus, the purpose of

this study was to explore the feelings and predominant negative emotions presented at the highest peak of the pandemic in Spain in order to disentangle if those experienced differ between people over and under 60 years old; and if some explored environmental variables could be partly related to these emotions. Overall, the results obtained indicate that a smaller proportion of older adults have experienced negative emotions when compared to the younger during the first peak of COVID-19 in Spain.

These results are consistent with the lower rates of anxiety, depression and acute stress previously reported in older adults by our group [21] and also other research groups [30] in Spain, as well as in other countries [31-32]. Moreover, evidence suggests that older adults as a group may be more resilient to the adverse effects from the pandemic, and it is noteworthy that emotions may have played a fundamental role. Emotions are conceived as responses to appraisals or interpretations of events [33] that elicit and coordinate changes in cognition, behavior and subjective experience [34-35]. Therefore, the lower proportion of all negative emotions experienced by older people reported in this study may partially explain why the emotional impact, contrary to what was expected at the beginning of the pandemic, has been lower in this age group compared to younger people, which could be partially explained by biological factors, such as the lower reactivity to stress previously described [14-15], but could also reflect a greater resilience.

Some external aspects such as low risk perception [36], less exposure to the stressors of COVID-19, financial stability or social status could explain part of this greater resilience observed in old age [37], but there are undoubtedly other

internal factors inherent to this population group that might justify why the response to stress generated by COVID-19 has awakened fewer negative emotions. Those over 60 years of age in Spain have grown up in the period of time that follows the Spanish civil war and may have developed strategies for managing adversity. In addition, the greater awareness of risk described in older people might have allowed them to implement proactive precautionary measures [38] that have undoubtedly contributed to increasing the feeling of security. Moreover, wisdom, a complex personality trait including empathy and compassion, emotional regulation, the ability to self-reflect, decisiveness while accepting uncertainty and diversity of perspectives, social advising, and spirituality [28] has been pointed out as a determinant of better response capacity to the pandemic of older compared to younger adults [39].

Our secondary objective was to assess whether the emotions experienced by older people were related to the presence of loneliness, regular practice of exercise, income loss and increased consumption of anxiolytic substances, which are the environmental variables that in a previous study by our group were associated with an increase in acute stress symptoms, anxiety and depression in older adults [21]. No associations have been found between any of the negative emotions explored in this study and regular practice of exercise nor loneliness. The former may be explained by exercise having been found to be a protective factor against the emotional impact of the COVID-19 [40]; and the latter, due to older people seeming to have prioritized quality over quantity of social interactions during the lockdown [41]. On the other hand, anger appeared related to economic losses; and both hopelessness and irritability were associated with an increase in the use of anxiolytics.

Results of this study should be interpreted in the light of some limitations and strengths. First, response bias exists given the voluntary nature of the online self-administered survey applied. Second, the list of selected emotions constitutes a mixture of basic and complex emotions chosen to provide ecological validity to the study; thus, not adhering to previously defined structured interview. Third, the survey was carried out during confinement, when perhaps due to the existing limitations to exercise, the expected negative relationship between physical activity and the emotions collected has been attenuated. And finally, positive feelings of altruism, responsibility and care in the face of COVID-19 regarding social interdependence that might have emerged [42] were not included. Strengths include data collection from a wide population sample, in real time, at the maximum peak of the pandemic avoiding memory-related biases.

The knowledge of the lesser presence of negative emotions in older adults alongside with the identification of some related environmental factors is crucial to figure out why, despite the seriousness and lethality of SARS-CoV-2 in this

age group, the emotional consequences have been mild. A better understanding of the emotional response older adults had developed in response to the pandemic could be useful to identify vulnerable groups and to design more efficient preventive therapies or counselling approaches to ameliorate the psychological impact of the pandemic. Additional longitudinal studies are needed to verify if these apparently positive early findings are maintained over time and if they can be applied to older adults from other backgrounds.

#### AUTHOR CONTRIBUTIONS

LGF and RRJ have taken charge of the conceptualization and methodology. VRF has carried out the data curation and formal analysis. LGF has written the original draft and RRJ, VRF, VR and GL have reviewed the final version.

#### CONFLICT OF INTEREST

Dr. R. Rodríguez-Jimenez has been a consultant for, spoken in activities of, or received grants from: Instituto de Salud Carlos III, Fondo de Investigación Sanitaria (FIS), Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Madrid Regional Government (S2010/BMD-2422 AGES; S2017/BMD-3740), JanssenCilag, Lundbeck, Otsuka, Pfizer, Ferrer, Juste, Takeda, Exeltis, Angelini, Casen-Recordati. Dr. Lahera has been a consultant to or has received honoraria or grants from Janssen-Cilag, Otsuka-Lundbeck, Lilly, Astra-Zeneca, CIBERSAM and Instituto de Salud Carlos III. All other authors declare that they have no conflict of interest.

#### FUNDING STATEMENT

This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

#### ACKNOWLEDGEMENT

- We thank all participants who have kindly responded to the survey.
- This study has been carried out in Spain.
- This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

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