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Running head: Loneliness, health professionals and COVID-19

Loneliness and not living alone is what impacted on the healthcare professional's mental health during the COVID-19 outbreak in Spain

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Conflict of Interest statement

Authors declare no conflict of interests

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Data Availability Statement/ Data Accessibility Statement

28 Data and materials supporting the results and analyses presented in this paper are
29 available from the corresponding author (M.C), upon reasonable request
30 **Loneliness and not living alone is what impacted on the healthcare professional's**
31 **mental health during the COVID-19 outbreak in Spain**
32

Abstract

The present study is aimed at exploring the role of loneliness in the healthcare professionals' mental health during the COVID-19 outbreak in Spain. A total of 1421 health care professionals that were in contact with at least one positive COVID-19 patient participated in a cross-sectional online survey from April to June 2020. Mental health was measured with the General Health Questionnaire-12, and loneliness was assessed with the 3-item UCLA Loneliness Scale. More than 80% of participants showed a certain prone to experience mental health problems, and 90% felt they had not enough workplace protective measures to manage COVID-19 patients. Presence of loneliness was positively related to higher mental health problems after controlling for other covariates. Other factors related to higher mental health problems were a higher COVID-19 risk perception, being in quarantine, checking COVID-19-related news several times a day, and having a lower training on managing infectious diseases. Neither living alone, nor supervisor social support, were related to healthcare professionals' mental health. Results suggest that the impact of COVID-19 in terms of mental health in the healthcare professionals could be more related to subjective appraisals of social isolation rather than to be physically alone. There were also a variety of cognitive, behavioural and training-related factors that were associated with the healthcare professionals' mental health, and that should be potentially managed in the mental health care interventions.

Keywords

Loneliness, COVID-19, mental health, healthcare professionals

56 **What is known about this topic?**

- 57 • Loneliness has been related to lower mental health in the general population
58 during the COVID-19 outbreak. However, its impact has not been analysed in
59 health care professionals.

60 **What this paper adds?**

- 61 • Presence of feelings of loneliness and not to live alone was related to lower
62 mental health scores in health care professionals during the COVID-19 outbreak,
63 after controlling for the effect of other covariates.
- 64 • The impact of COVID-19 on healthcare professionals' mental health could be
65 related to subjective feelings of social isolation rather than to be physically
66 alone.
- 67

Introduction

Approximately 20% of COVID-19 front-line health-care workers are suffering some affective and anxiety problem (Pappa *et al.*, 2020). Psychological impact of COVID-19 seems to be greater for health professionals that did not have enough protective measures or received insufficient information (García-Fernández *et al.*, 2020), worked in a region with high incidence of COVID-19 (Romero *et al.*, 2020), spent higher time consulting COVID-19 news (Ni *et al.*, 2020), and have previous history of mental and chronic physical health problems (Zhu *et al.*, 2020). Apart from all the professional challenges that the pandemic has brought to healthcare professionals, at a personal level some of them have to avoid their families, friends or colleagues for fear of spreading the virus to them (Kang *et al.*, 2020). This might lead health professionals to be a high-risk group for feeling loneliness. The negative relationship between feelings of loneliness and mental health has been mainly analysed in older people (Courtin & Knapp, 2017; Gardiner, Geldenhuys, & Gott, 2018), and during the COVID-19 pandemic in the general population (Li & Wang, 2020). However, the role of loneliness on the health professionals' mental health, has been less analysed. In addition, the existing literature reporting the relationship between loneliness and mental health during the COVID-19 crisis, has not jointly included other measures of social contacts such as social support or living situation (Killgore, Cloonen, Taylor, & Dailey, 2020). Therefore, it is still unknown whether the impact of COVID-19 is related to be physically isolated, to the subjective perceptions of social isolation or to both of them. To examine the impact of loneliness on health professional's mental health is important since there are available efficient techniques to manage feelings of loneliness that have produced significant decrease of loneliness (Masi, Chen, Hawkley, & Cacioppo, 2011). For instance, interventions that enhance participants to examine the nature of and factors involved in

their loneliness and rethinking ways of reducing it (Conoley & Garber, 1985), or that promote the development of positive interpersonal relationships and provide support to face with possible social issues (Chiang et al., 2010). All of these techniques might be potentially included in the design of psychosocial interventions addressed to the healthcare professionals that are on the COVID-19 front line

The present study is aimed to examine the importance of loneliness on the health professionals' mental health in a sample of Spanish healthcare professionals.

Methods

Sample and design

Study consisted of a cross-sectional national self-administrated online survey starting on 24 April to 5 June 2020. The e-survey was disseminated by social networks, and our institutional website (www.ccomsuam.org). An exponential non- discriminative snowball sampling was used. Inclusion criteria were healthcare professionals or resident physicians working in health or social care centres since February 2020 (first detected case of COVID-19 in Spain). A total of 1706 professionals agreed to participate and completed the questions. From them, 285 participants did not have any contact with a positive COVID-19 patient, and were excluded from analyses. Finally, data from 1421 professionals were analysed. The first page of the online survey informed participants about scope, content, the kind of information collected and that the participation was completely anonymous and voluntary. A contact point was included in case of questions or further information. The first page also included a checkbox that participants had to click on to confirm their consent to participate. All study methods were reviewed and approved by the Princesa's Hospital Ethics Committee Board.

Measures

The presence of mental health problems was measured with the 12-Item General Health Questionnaire (GHQ-12) (Goldberg & Williams, 2000). The questionnaire consists of 12 items, and response options were recorded on a four-point scale (1 'less than usual', 2 'no more than usual', 3 'rather more than usual', and 4 'much more than usual'). Then, 1 and 2 are recoded to 0, and 3 and 4 are recoded to 1. Total scores ranged from 0 to 12 with higher scores indicating worse mental health status. GHQ-12 Scores higher than 3 might indicate cases of general mental problems (Goldberg and Williams, 1988). In our study, the Cronbach's alpha coefficient of the GHQ-12 was 0.79.

Loneliness was measured with three-item UCLA loneliness scale (Hughes, Waite, Hawkley, & Cacioppo, 2004). Questions included "How often do you feel that you lack companionship?"; "How often do you feel left out?"; "How often do you feel isolated from others?". Each item was measured on a 3-point scale (1=hardly ever; 2=some of the time; 3=often). The scores for each item were added into a total score ranging from 3 to 9. Higher scores indicating a greater degree of loneliness. Scores higher than 6 have been proposed to be indicative of feelings of loneliness (Shiovitz-Ezra & Ayalon, 2012). Total scores were dichotomized using scores higher than 6 as indicative of the presence of loneliness. Scale showed a good internal reliability in our sample (Cronbach's alpha=0.88).

Living alone was collected using the question "How many people live in your house?". Responses were categorized into; living alone and living with someone else.

Social support from supervisors or superiors during the COVID-19 outbreak was measured by the question "Mark the level of social support received from your supervisors/superiors during the COVID-19 outbreak". Responses included three categories: low, medium, and high.

According to the consulted previous literature reporting the effects of COVID and of other previous pandemic on mental health (Chong et al., 2004; García-Fernández et al., 2020; Guo et al., 2020), the following covariates were also included:

i) Previous history of mental health problems was collected using the question “Have you ever sought help from a mental health professional?”. Two response options were included: “no, never” and “yes”.

ii) COVID risk perception was measured with ten items that were adapted from a questionnaire used in previous studies assessing the Severe Acute Respiratory Syndrome (SARS) risk perception (Chong *et al.*, 2004; Wu *et al.*, 2009). Questions included “I believed that my job was putting me at great risk”; “I felt extra stress at work”; “I was afraid of falling ill with COVID”, “I felt I had little control over whether I would get infected or not”; “I thought I would be unlikely to survive if I were to get COVID”; “I thought about resigning because of COVID”, “I was afraid I would pass COVID on to others”, “My family and friends were worried that they might get infected through me”, “I accept the risk of caring for COVID patients” and “People avoid my family because of my work” were assessed on a five-point Likert scale (1, strongly disagree; 2, disagree; 3, not sure; 4, agree; 5, strongly agree). A total global score was calculated adding all the items. Internal reliability of this scale in our sample was moderate (Cronbach’s $\alpha=0.77$).

iii) The level of protective measures in the workplace was assessed using the question: “I think there have been enough protective measures to prevent contagious in my workplace”. Responses were coded as yes or no.

iv) Previous level of formation on infectious diseases was collected using the question “Rate your knowledge of how to manage infectious diseases” Response options were codified in three categories: low, moderate, and high.

Finally, information on v) gender; vi) age (18-30, 31-40, 41-50, 51-60 and older than 60 years); vii) type of healthcare professional (doctor, nurse, and others); viii) health care setting (Hospital, Primary health care centre, others); ix) being currently in quarantine (yes/no); x) mass media used to be informed on COVID-19 (TV/Radio; Digital newspapers, Social Media or others); and xi) frequency of access to COVID-19 related-news (several times a day; once a day or less), were also collected.

Analyses

Counts and percentages were calculated for qualitative variables. Means and standard deviations were used to describe qualitative variables. Normality of GHQ-12 scores was tested using Shapiro –Wilk W test. Univariate analyses of variance (ANOVA) and Pearson’s correlations were conducted to check the variables potentially related to higher mental health problems. Finally, a multiple linear regression model was conducted including mental health problems (GHQ-12) as outcome measure to examine whether feelings of loneliness was related to mental health after controlling for the effect of other variables. Analyses were performed using Stata version 15. The level of statistical significance was fixed at $p \leq 0.05$.

Results

Sample characteristics are described in table 1. In summary, sample was mainly composed by women (79%). Only 14% of the sample lived alone. However, more than a half of the participants (53%) experienced feelings of loneliness. More than 90% of the health professionals reported that there had not been enough protective measures for COVID-19 in their workplaces. Regarding to mental health, 83% of the sample scored higher than three in the GHQ-12 questionnaire, showing a certain prone to experience mental health problems.

Results of uncontrolled analyses are reported in table 2. The results showed that higher mental health problems were related to be female, to work in a hospital, to experience feelings of loneliness, to have received a lower supervisor social support, to have a higher COVID risk perception, to be in quarantine, to consult on COVID-19 news several times a day, to have sought ever mental health professional help, to have a low training on how to manage infectious disease, and to not have enough preventive measures for COVID-19 in the workplace.

Multivariate analyses are showed in table 3. The results indicated that to experience feelings of loneliness was related to higher mental health problems. In addition, other variables related to higher mental health problems among the health care professionals were: higher perception of COVID risk, to consult on COVID-19 news several times a day, to be in quarantine, and to have a lower training on how to manage infectious diseases. On the other hand, gender and age were not significantly related to mental health in the multivariate model. Similarly, working in a hospital in comparison with working in primary health care, to have a low perceived supervisor support, to perceive low preventive workplace measures, and to have ever sought mental health help were not associated with lower mental health, after controlling for the effect of other variables. Living alone was not related to higher mental health problems.

Discussion

The present study has found several relevant findings. Firstly, the results have showed that 83% of health professionals could be prone to experience some mental health problem during the COVID-19 outbreak. This number is also considerably higher in comparison with previous studies conducted in other countries where the number of health professionals mentally affected has ranged from 39% to 60% (Dai, Hu, Xiong, Qiu, & Yuan, 2020; Maciaszek et al., 2020). Several explanations might be given for

215 this difference. One of them is that Spain has been one of the countries with higher
216 proportion of healthcare professionals infected by COVID-19 (Crespo, Calleja, &
217 Zapatero, 2020). Another explanation could be related to the time this study was
218 conducted. Data collection was conducted after two months the first COVID-19 case
219 appeared in Spain. It is possible that exhaustion, anxiety and mood symptoms could be
220 more likely at mid-term than in earliest moments of the COVID-19 outbreak (Gerada &
221 Walker, 2020). On the other hand, it is also important to acknowledge that this study
222 used a convenience sampling. It is possible that healthcare professionals that agreed to
223 participate were the most mentally affected. Nonetheless, the fact that 80% of
224 participants had at high mental health risk, underlines the great impact that COVID-19
225 is having on the healthcare professionals' mental health, and the importance of
226 supporting them in terms of mental health. Qualitative studies should be further
227 conducted to comprehensively collect the experience of health professionals during the
228 COVID-19 crisis.

229 Secondly, our study has showed that, after controlling for other covariates, the presence
230 of feelings of loneliness was related to lower mental health in healthcare professionals.
231 The prevalence of health professionals with feelings of loneliness was 53% in our study.
232 This number is very high if we consider that the prevalence of people who have feelings
233 of loneliness is around 30% in the Spanish adult population (Martín-María et al., 2020).
234 There are efficient measures of managing loneliness ranging from enhancing high-
235 quality social contacts, improving social skills and addressing maladaptive social
236 cognition (Masi et al., 2011). Our results suggest that these elements should be
237 potentially part of the mental health interventions addressed to health professionals. In
238 addition, our study reported that living alone was not a significant related factor for
239 lower mental health. This result is in line with previous literature that has showed that

people living alone did not show poor mental health, but people living alone and feeling alone did (Smith & Victor, 2019). Therefore, living alone, in itself, might not be what makes people lonely but what has led to living alone (e.g. a bereavement...) is significant (Victor, Scambler, Bowling, & Bond, 2005) . This result also suggests that healthcare professionals that live alone could still be able to maintain a good mental health if they adequately manage their feelings of loneliness. Although this finding warrants further research, it might also suggest that the impact of COVID-19 on mental health is probably more related to the subjective perception of social isolation rather than to have objective social contacts. Some evidence has pointed that feelings of loneliness have not increased during the COVID-19 crisis in the general population (McGinty, Presskreischer, Han, & Barry, 2020). However, this may not be the same for health professionals. The study of prospective changes of loneliness in health professionals before, during, and after the COVID-19 crisis warrants further investigation. In our study, social support from superiors was not a significant factor related to mental health after controlling for other variables. This finding warrants further investigation since previous studies have reported that workplace social support was an important factor for mental health among healthcare professionals in China during the COVID-19 crisis (Xiao, Zhang, Kong, Li, & Yang, 2020). However, it is possible that these differences are due to the fact our study measured social support from their supervisors, whereas previous studies have also included social support from co-workers or colleagues. Moreover, our study also underlined the need for healthcare professionals to be trained to manage infectious disease since it also impacted on their mental health. Another factor related to lower mental health was a higher COVID risk perception. Literature has showed that certain level of risk perception is positive since it could be related to adopt higher protective measures (Wise, Zbozinek, Michelini, &

Hagan, 2020). However, experiencing an excessive level of risk perception might be also related to have a poor sense of self-efficacy (Dryhurst et al., 2020). Sources of the COVID-19 risk perception (lack of workplace protection, personality characteristics, and other health related factors) should be probably explored and managed for each healthcare professional, individually.

Similarly to other studies conducted with Spanish health professionals, uncontrolled analyses showed that younger age, working in a hospital, to have ever sought mental health help (Romero et al., 2020), and a low perception of preventive measures (García-Fernández et al., 2020) were related to lower mental health. However, these variables were no longer related to mental health, after controlling for the effect of other factors. These results suggest the need for including multivariate analyses in the study of variables related to the emotional impact of COVID-19 in health professionals. On the other hand, inconclusive findings have been found when comparing the effects of the COVID-19 outbreak among different health professionals. Whereas some studies have reported that nurses might report higher mental health problems (García-Fernández et al., 2020), our study together with others (Romero et al., 2020) have found that nurses did not show lower mental health in comparison with other health professionals. Our results also showed that gender was not a significant factor. However, other studies have found that females might be at higher risk for emotional exhaustion (Giusti et al., 2020). Further studies should clarify the role of gender. Finally, being in quarantine and checking COVID-19-related news several times a day, were related to lower mental health, which is congruent with previous literature (Dai et al., 2020; Ni et al., 2020). According to these results, behavioural regulation mechanisms on checking COVID-19-related news, could be proposed during interventions. In addition, our results suggest

that psychological impact of quarantine could be related not only to feeling alone (that was controlled in the analysis) but also to fear of being infected.

This study has showed that higher feelings of loneliness are related to poorer mental health in Spanish health professionals during the COVID-19 outbreak. The number of health professionals included, the variety of variables collected, and the use of multivariate analyses, are the main study strengths. However, the results of this study should be also interpreted in the light of the following limitations. Firstly, the most important one is the use of a non-probabilistic convenience sampling which might be associated with a selection bias where healthcare professionals with specific characteristics were likely to not participate. For instance, those who were less mentally affected. Secondly, we included a great variability of health professionals ranging from those who were on the COVID-19 front line to those who did not treat directly COVID-19, but have contacts with COVID-19 patients as part of their daily clinical routine. Unfortunately, we did not collect enough information to differentiate among these two healthcare professional groups. Thirdly, the survey was not piloted in advance. Fourthly, there were variables related to workplace that should be further explored, as 90% of participants reported that there had not been enough protective measures in the workplace. Fifthly, our study has used living alone as proxy measure of physical close social contacts. However, there are probably other measures of social contacts, both face-to-face and online, that have not been here analysed, and that warrant further research. Sixthly, although the General Health Questionnaire-12 is a valid instrument, it does not provide information on confirmed clinical mental diagnoses. Therefore, the prevalence of potential mental health problems in our sample should be cautiously interpreted. Finally, the present study is cross-sectional, so the direction of associations cannot be established.

In spite of all these limitations, this study has showed that feelings of loneliness are related to lower mental health in healthcare professionals during the COVID-19 outbreak, whereas living alone was not associated with lower mental health. This result suggests that the psychological impact of COVID-19 could be probably more related to subjective experiences of social isolation rather than to be physically alone. This study has also reported that the psychological impact of COVID-19 on health professionals is related to multiple behavioural, cognitive, and training-related variables. Interventions addressed to manage mental health in the healthcare professionals should potentially include different modules to manage all these elements.

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