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## Do coping responses predict better/poorer mental health in Portuguese adults during Portugal's national lockdown associated with the COVID-19?

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### ABSTRACT

**Background:** This study aimed at assessing the mental health status of adults living in Portugal during the national lockdown of March 2020 to May 2020, how study participants coped with stress during the national lockdown, as well as the association between coping responses and mental health status.

**Methods:** 430 adults from the general population living in Portugal completed measures of mental health status and coping.

**Results:** Participants reported a mental health status in the normal range. Most commonly used coping responses were acceptance, planning and active coping. The use of instrumental and emotional support, self-blame, venting, denial, behavioural disengagement, and substance use were associated with poorer mental health. Active coping, positive reframing, acceptance, and humour were associated with better mental health. However, only positive reframing and humour significantly predicted better mental health, while only substance use predicted poorer mental health.

**Conclusions:** Findings suggest that there was not a significant negative impact of the Portuguese national lockdown in the adults living in Portugal. Findings supported positive reframing and humour as being adaptive coping responses in this context. These responses should be encouraged by healthcare professionals and targeted in the context of psychosocial intervention programs directed to most vulnerable populations.

### 1. Introduction

The rapid emergence of the COVID-19 pandemic all over the world and subsequent measures undertaken by states and governments to tackle this public health emergency have radically changed individuals' daily and social behaviour. The low predictability of COVID-19 pandemic evolution, the measures put into place by states and governments and their socioeconomic consequences, as well as the social behaviour changes, threatens individuals' physical and mental health and well-being, which challenges individuals' ability to cope with such a cluster of stressors (Cao et al., 2020; Duan & Zhu, 2020; Mazza et al., 2020; Moccia et al., 2020; Park et al., 2020; Wang, Pan, et al., 2020a; Xiao, 2020).

Previous research on the impact of prior epidemic outbreaks (e.g.,

SARS) shows that the most common psychological responses to these public health emergencies are anxiety, fear, somatic symptoms, depression, stigmatization, abandonment, and isolation (Chan et al., 2007; Chew, Wei, Vasoo, Chua, & Sim, 2020; Lau et al., 2008; Mok, Chung, Chung, & Wong, 2005; Nickell, 2004; Siu, Sung, & Lee, 2007; Tsang, Scudds, & Chen, 2004). The psychological impact of these epidemic outbreaks seemed to be aggravated by: (a) the sense of threat and vulnerability to the disease (Siu, Sung, & Lee, 2007); (b) the lack of information about the course of the disease and the uncertainty regarding both treatment course and outcomes (Chan et al., 2007; Lee, Chan, Chau, Kwok, & Kleinman, 2005; Mok, Chung, Chung, & Wong, 2005); (c) the financial stability of the family and significant others (Rabelo et al., 2016); and (d) the disruption in daily routine and work (Chew, Wei, Vasoo, Chua, & Sim, 2020).

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Thus, there is a risk that the prevalence of anxiety and depression will increase in the context of COVID-19 pandemic (Holmes et al., 2020). A lot of the anticipated consequences of a lockdown (Brooks et al., 2020) and associated physical distancing measures are themselves risk factors for mental health illness (Holmes et al., 2020) and may represent different risk pathways. Preliminary data on the emotional response to COVID-19 pandemic in China and Italy suggests that COVID-19 pandemic, along with the lockdown and its consequences, resulted in a significant negative impact on individuals' mental health and well-being (Cao et al., 2020; Mazza et al., 2020; Moccia et al., 2020; Wang, Pan, et al., 2020a). According to these preliminary studies, the psychological impact of COVID-19 outbreak includes mild to severe depressive, anxiety and stress symptoms (Banerjee & Rai, 2020; Cao et al., 2020; Mazza et al., 2020; Simms, Fear, & Greenberg, 2020; Wang, Pan, et al., 2020a). These symptoms seem to be aggravated by having an acquaintance infected with COVID-19, not being able to telework, not having access to adequate safety equipment, reporting poorer health status, family income instability, and loneliness associated with the (self-)isolation and physical distancing (Banerjee & Rai, 2020; Cao et al., 2020; Mazza et al., 2020; Simms, Fear, & Greenberg, 2020; Wang, Pan, et al., 2020a).

When faced with such a cluster of stressors, individuals often engage in a number of cognitive and behavioural responses to cope with stress and protect their mental health and well-being (Lazarus & Folkman, 1984; Park & Folkman, 1997). There is a call for research on how people are dealing with stress in the context of COVID-19 pandemic, as many of the most adaptive ways to cope with stress during crises (e.g., seeking social support, active coping strategies) may be incompatible with some of the World Health Organization (WHO) and government agencies recommendations to prevent the spread of COVID-19 (e.g., physical distancing) (Aldwin, 2007; Baumeister & Leary, 1995; Finkelstein-Fox & Park, 2019; Park et al., 2020; Sun et al., 2019). On the other hand, previous studies on individuals' response to past epidemic outbreaks (e.g., SARS, H1N1), to COVID-19 pandemic and the government-imposed measures and its consequences, suggest that coping responses vary greatly. Coping responses include those found to be universally maladaptive (e.g., self-blame, avoidance, substance use) or those that are incongruent with government agencies' recommendations (e.g., not complying with physical distancing and isolation rules) (Atchison et al., 2021; Cao et al., 2020; Clay & Parker, 2020; Main, Zhou, Ma, Luecken, & Liu, 2011; Park et al., 2020; Taha, Matheson, Cronin, & Anisman, 2014; Wang, Ng, & Brook, 2020b; Wang, Pan, et al., 2020a).

Nevertheless, available information regarding the psychological impact of how individuals are coping with COVID-19 pandemic and government-imposed measures is scarce. Moreover, coping is a situation-determined variable (e.g., distraction), and the degree of utility and (mal)adaptability of some coping responses may vary from one situation, context and population to another (Aldwin, 2007; Finkelstein-Fox & Park, 2019; Novy et al., 1998; Sharma et al., 2020). Thus, coping strategies that were found to be useful in previous public health emergencies or to deal with other types of stressors, may not be useful in the context of the ongoing, open-ended pandemic. The degree of utility and (mal)adaptability of a given coping strategy in the context of COVID-19 pandemic is still unknown. This knowledge is paramount to understand how clinicians can effectively support the population in dealing with COVID-19 pandemic, as well as with future outbreaks. Given these considerations, this study aims to: (1) evaluate the mental health status of adults living in Portugal during the national lockdown associated with the COVID-19 outbreak; (2) examine how study participants cope with stress during the national lockdown; and (3) assess the association between coping responses employed during the national lockdown and self-reported mental health status. If findings from previous research relative to the former and current epidemic/pandemic outbreaks and to the impact of coping with social isolation were to replicate, we hypothesize that: (1) the mental health of the population would be poor; (2) the use of coping strategies found in the literature to

be adaptive would be associated with better mental health (e.g. active coping, positive reframing, acceptance) (Dindo & Lackner, 2017; Jungmann & Witthöft, 2020; Park et al., 2020; Wang, Pan, et al., 2020a); and (3) the use of coping strategies found in the literature to be maladaptive would be associated with poorer mental health (e.g. self blame, denial, substance use) (Atchison et al., 2021; Clay & Parker, 2020; Dindo & Lackner, 2017; Jungmann & Witthöft, 2020; Wang, Ng, & Brook, 2020b).

## 2. Materials and methods

### 2.1. Participants

The minimum sample size recommended to detect a significant effect in hierarchical multiple regression analysis was determined using an a priori power calculation using an online calculator, considering sixteen predictors, and assuming a medium effect size of 0.15 (Cohen's  $f^2$ ), an alpha level of 0.01, and power of 0.80 (Cohen, 1988; Soper, 2018). This calculation indicated that 183 participants would be needed to be able to detect significant effects.

Participants were 430 adults living in Portugal during the national lockdown associated with the COVID-19 outbreak. Inclusion criteria were: (a) being 18 years old or older; (b) living in Portugal at the time of the national lockdown of March 19th through May 2nd 2020; (c) being able to read and understand Portuguese; and (d) being willing to participate. Participants with a cognitive impairment that prevented participation were excluded from the study sample.

### 2.2. Measures

Study participants completed a sociodemographic and clinical history questionnaire (e.g. gender, age, education level, employment status, chronic health conditions), as well as measures of self-reported mental health and coping responses to deal with stress.

#### 2.2.1. Mental health

Mental health was assessed using the Portuguese version of the five-item Mental Health Inventory (MHI-5) (Berwick et al., 1991; Pais-Ribeiro, 2001). Respondents are asked to rate the frequency of depression and anxiety symptoms (nervousness, depressed affect) and positive aspects of mental health (feeling calm, happy) experienced in a given period of time, in a 6-point type of Likert scale (from 1 = "Always", to 6 = "Never"). A total score, ranging from 5 to 30, is computed. Higher scores indicate poorer mental health; a score of at least 21 indicates poor mental health (Rumpf, Meyer, Hapke, & John, 2001). Previous research supports both the original and Portuguese versions of the MHI-5 validity and reliability as a screening measure of mental health (Berwick et al., 1991; Pais-Ribeiro, 2001). In the current sample, the scale showed a good internal consistency ( $\alpha = 0.88$ ).

#### 2.2.2. Coping responses

Coping responses employed to deal with stress during the national lockdown were assessed using the Portuguese version of the Brief COPE (Carver, 1997; Pais-Ribeiro & Rodrigues, 2004). Respondents are asked to rate the frequency with which a person uses different coping strategies experienced in a given stressful event in a 4-point type of Likert scale (from 1 = "I haven't been doing this at all", to 4 = "I've been doing this a lot"). Higher scores indicate greater frequency of use of a given coping strategy in response to a stressful event. Items are distributed by 14 two-item subscales: (1) self-distraction, (2) active coping, (3) denial, (4) substance use, (5) use of emotional support, (6) use of instrumental support, (7) behavioural disengagement, (8) venting, (9) positive reframing, (10) planning, (11) humour, (12) acceptance, (13) religion, and (14) self-blame. Previous research supports both the original and Portuguese versions of the Brief COPE validity and reliability as a screening measure of coping responses (Carver, 1997; Pais-Ribeiro &

Rodrigues, 2004). Cronbach's alphas for the Brief COPE subscales in the current sample were in the range of those observed in the validation studies of both the original version ( $0.50 < \alpha < 0.90$ ) and the Portuguese version ( $0.55 < \alpha < 0.84$ ) of this measure (Carver, 1997; Pais-Ribeiro & Rodrigues, 2004). Cronbach's alphas ranged between 0.62 and 0.92, indicating borderline to good internal consistency, except for the self-distraction ( $\alpha = 0.56$ ), denial ( $\alpha = 0.53$ ), and self-blame ( $\alpha = 0.58$ ) subscales.

### 2.3. Procedures

Approval for this cross-sectional study was obtained from the Ethical Committee for Research from ISPA (reference I/033/04/2020). The study data was collected between April 1st, 2020 and May 2nd, 2020, using the online survey platform Qualtrics hosted by ISPA – Instituto Universitário for the purpose. Prospective participants were invited to participate via online social media containing a brief explanation of the study aims and procedures. The message also included a link to an informed consent statement and to the online survey questionnaire. Participants were assured that participation was anonymous and voluntary and that they could drop participation at any time, without any consequences. Informed consent was obtained from all participants who accepted to participate.

#### 2.3.1. Statistical analysis

We first computed means and standard deviations for the study measures with descriptive purposes. Next, we computed a series of partial correlation coefficients, controlling for sex, age, employment status and being (or not) in telework, to examine the univariate associations between self-reported mental health status and coping responses employed by the study participants to deal with stress during the lockdown. We then performed a multiple hierarchical regression analysis controlling for sex, age, employment status and being (or not) in telework, to test the predictive importance of coping responses on self-reported mental health status. The  $f$  of Cohen was computed as a measure of effect size, with effects of 0.02 being considered small, 0.15 medium, and 0.35 large (Cohen, 1988). Before these analyses, we assessed if the assumptions required for the planned analyses were met. We assessed normality of the distributions of study measures by computing skewness ( $Sk$ ) and kurtosis ( $Ku$ ). Values of  $Sk$  and  $Ku$  lower than 3 and 10, respectively, were indicative of absence of severe deviance from the normal distribution (Kline, 2000; Kline, 2015). Normality of residuals' distribution and homoscedasticity of residuals were evaluated by analysing the normal probability plot of the residuals (Tabachnick & Fidell, 2014). The Durbin-Watson statistic was computed to evaluate the independence of errors. A value close to 2 indicates absence of violation of these assumptions. Variance inflation factor (VIF) for the predictor variables was calculated to examine multicollinearity. A VIF lower than 5 indicates absence of multicollinearity (Craney & Surles, 2002).

Missing data from any of the coping scales resulted in that scale being excluded from the analysis. A single missing response from the MHI-5 was replaced with the series mean. To control for  $\alpha$ -inflation, we used an  $\alpha$ -level of 0.01 to determine that regression analysis results were statistically significant. All data analyses were performed with IBM SPSS Statistics (v. 25).

## 3. Results

### 3.1. Participants' characteristics

Table 1 summarizes the sample's sociodemographic characteristics. Most participants (71%) were women. Ages ranged between 18 and 73 ( $M = 39.9$ ;  $SD = 14.44$ ). Participants' education level was relatively high, with 76% having completed a college degree. Most participants were (part- or full-time) employed (67%), most of whom were in

**Table 1**  
Participants' sociodemographic characteristics ( $N = 430$ ).

|                         | <i>n</i> (%) | <i>M</i> | <i>SD</i> | Min–max |
|-------------------------|--------------|----------|-----------|---------|
| Sex (women)             | 306 (71)     | –        | –         | –       |
| Age                     | –            | 39.9     | 14.44     | 18–73   |
| Education level         |              |          |           |         |
| Fourth grade or lower   | 5 (1)        | –        | –         | –       |
| Fifth to 12th grade     | 97 (23)      | –        | –         | –       |
| College                 | 326 (76)     | –        | –         | –       |
| Marital status          |              |          |           |         |
| Married or cohabitation | 180 (42)     | –        | –         | –       |
| Widowed                 | 5 (1)        | –        | –         | –       |
| Divorced/separated      | 37 (9)       | –        | –         | –       |
| Single                  | 208 (48)     | –        | –         | –       |
| Employment status       |              |          |           |         |
| Unemployed              | 28 (7)       | –        | –         | –       |
| Employed                | 288 (67)     | –        | –         | –       |
| Student                 | 86 (20)      | –        | –         | –       |
| Retired                 | 28 (7)       | –        | –         | –       |
| Telework (yes)          | 176 (67)     | –        | –         | –       |

telework regime during the lockdown (67%).

### 3.2. Descriptive statistics

Table 2 summarizes the descriptive statistics for the study variables. As can be seen, the sample's mental health was, on average, 15 ( $SD = 4.48$ ), i.e., lower than the cut-off point for poor mental health [ $t(429) = -27.67$ ;  $p < .001$ ]. The most commonly used coping strategies to deal with stress during the national lockdown were acceptance ( $M = 3.65$ ;  $DP = 1.42$ ), planning ( $M = 3.52$ ;  $DP = 1.43$ ), and active coping ( $M = 3.3$ ;  $DP = 1.49$ ). The least employed coping strategies were substance abuse ( $M = 0.39$ ;  $DP = 1.01$ ), denial ( $M = 0.68$ ;  $DP = 1.03$ ), and behavioural disengagement ( $M = 0.75$ ;  $DP = 1.18$ ).

### 3.3. Association between coping strategies and mental health

As shown in Table 2, use of instrumental support, use of emotional support, self-blame, venting, denial, behavioural disengagement, and substance use were positively associated with poorer mental health ( $0.17 < r < 0.32$ ), while active coping, positive reframing, acceptance, and humour were negatively associated with poorer mental health ( $-0.36 < r < -0.11$ ).

Results of the multiple hierarchical regression analyses for mental health are presented in Table 3. As shown, both demographic variables accounted for 5% of the variance of mental health, while employment status and teleworking accounted for an additional and not statistically significant 1% of variance explained. When coping responses were added, they accounted for an additional and statistically significant 30% of the variance of mental health ( $f^2 = 0.49$ ,  $p < .001$ ), with coping strategies of positive reframing and humour significantly predicting better mental health, while substance use predicted poorer mental health.

## 4. Discussion

Our study aimed at assessing the mental health status of adults living in Portugal during the national lockdown associated with the COVID-19 outbreak, examining how study participants coped with stress during the national lockdown and assessing the association between coping responses employed during the national lockdown and self-reported mental health status. We hypothesize that: (1) the mental health of the study participants would be poor; (2) the use of coping strategies found in the literature to be adaptive would be associated with better mental health (e.g. active coping, positive reframing, acceptance); and (3) the use of coping strategies found in the literature to be maladaptive would be associated with poorer mental health (e.g., self-blame, denial,

**Table 2**

Means and SDs for the study measures and partial correlations (controlling for age, sex, employment status and teleworking) with mental health.

|                             | n   | M     | SD   | Sk    | Ku    | Min-max | Partial correlations MIH-5 |
|-----------------------------|-----|-------|------|-------|-------|---------|----------------------------|
| MHI-5                       | 430 | 15.02 | 4.48 | 0.36  | -0.10 | 5-29    | -                          |
| Brief COPE subscales        |     |       |      |       |       |         |                            |
| Active coping               | 413 | 3.31  | 1.49 | -0.16 | -0.36 | 0-6     | -0.11*                     |
| Planning                    | 401 | 3.52  | 1.43 | -0.24 | -0.23 | 0-6     | -0.08                      |
| Use of instrumental support | 401 | 2.10  | 1.54 | 0.45  | -0.27 | 0-6     | 0.17**                     |
| Use of emotional support    | 408 | 2.48  | 1.64 | 0.37  | -0.38 | 0-6     | 0.17**                     |
| Religion                    | 401 | 1.52  | 1.72 | 1.09  | 0.36  | 0-6     | -0.02                      |
| Positive reframing          | 408 | 3.19  | 1.48 | 0.12  | -0.44 | 0-6     | -0.36***                   |
| Self-blame                  | 401 | 1.50  | 1.27 | 1.18  | 1.69  | 0-6     | 0.27***                    |
| Acceptance                  | 401 | 3.65  | 1.42 | -0.15 | -0.41 | 0-6     | -0.26***                   |
| Venting                     | 401 | 2.56  | 1.55 | 0.40  | -0.28 | 0-6     | 0.18***                    |
| Denial                      | 413 | 0.69  | 1.03 | 1.85  | 4.20  | 0-6     | 0.25***                    |
| Self-distraction            | 408 | 2.74  | 1.52 | 0.13  | -0.50 | 0-6     | 0.10                       |
| Behavioural disengagement   | 408 | 0.76  | 1.19 | 1.73  | 2.96  | 0-6     | 0.32***                    |
| Substance use               | 408 | 0.38  | 1.01 | 3.21  | 11.83 | 0-6     | 0.28***                    |
| Humour                      | 401 | 2.22  | 1.52 | 0.41  | -0.29 | 0-6     | -0.17**                    |

Note: MHI-5 – Mental Health Inventory; Brief COPE – Short version of the COPE Inventory.

\*  $p < .05$ .

\*\*  $p < .01$

\*\*\*  $p < .001$ .

**Table 3**

Hierarchical regression analysis predicting mental health.

|                             | R <sup>2</sup> | ΔR <sup>2</sup> | ΔF      | β       |
|-----------------------------|----------------|-----------------|---------|---------|
| Step 1                      | 0.05           | 0.05            | 11.17** |         |
| Gender (1 = Male)           |                |                 |         | -0.19** |
| Age                         |                |                 |         | -0.11   |
| Step 2                      | 0.06           | 0.01            | 0.89    |         |
| Unemployed (1 = Yes)        |                |                 |         | -0.05   |
| Employed (1 = Yes)          |                |                 |         | -0.09   |
| Student (1 = Yes)           |                |                 |         | -0.12   |
| Retired (1 = Yes)           |                |                 |         | -0.10   |
| Telework (1 = Yes)          |                |                 |         | -0.10   |
| Step 3                      | 0.67           | 0.30            | 12.88** |         |
| Active coping               |                |                 |         | -0.05   |
| Planning                    |                |                 |         | 0.09    |
| Use of instrumental support |                |                 |         | -0.01   |
| Use of emotional support    |                |                 |         | 0.04    |
| Religion                    |                |                 |         | 0.001   |
| Positive reframing          |                |                 |         | -0.29** |
| Self-blame                  |                |                 |         | 0.11    |
| Acceptance                  |                |                 |         | -0.10   |
| Venting                     |                |                 |         | 0.12    |
| Denial                      |                |                 |         | 0.11    |
| Self-distraction            |                |                 |         | 0.06    |
| Behavioural disengagement   |                |                 |         | 0.12    |
| Substance use               |                |                 |         | 0.16**  |
| Humour                      |                |                 |         | -0.12*  |

Note:

\*  $p < .01$ .

\*\*  $p < .001$ .

substance use) ( Atchison et al., 2021; Clay & Parker, 2020; Dindo & Lackner, 2017; Jungmann & Witthöft, 2020; Wang, Ng, & Brook, 2020b). Study hypotheses were only partially corroborated.

Contrarywise to our hypothesis, study participants’ self-reported mental health was in the normal range. Also, although the use of emotional support, self-blame, venting, denial, behavioural disengagement, and substance use were significantly associated with poorer mental health, as expected, contrarywise to our hypothesis, the use of instrumental support was positively significantly associated with poorer mental health. Finally, while active coping, positive reframing, acceptance, and humour were positively significantly associated with better mental health, as hypothesized, planning and religion were not associated with mental health. Despite these significant correlations, only positive reframing and humour predicted better mental health, while only substance use predicted poorer mental health.

Absence of decreased mental health status in the study participants may be attributed to the sociodemographic characteristics of the study sample. In fact, the study sample was composed mostly by highly educated participants with higher household income as compared to the national average household income (Instituto Nacional de Estatística, 2020). As previous literature shows, health is unevenly distributed among human populations. Individuals with low socioeconomic status have worse health status compared to individuals with high socioeconomic status: they get sicker, die earlier and have worse access to health services (Marmot, Allen, Bell, Bloomer, & Goldblatt, 2012; Teixeira et al., 2016). Regarding the influence of socioeconomic status on health, individuals with higher socioeconomic status are more likely to have been exposed to fewer stressors as compared to those from lower socioeconomic status (Lott, 2012). For example, the former were more probable to have employments compatible with telework, while the latter are more likely to have professions requiring maintenance of their professional activity as usual (e.g., supermarket worker) or to have professional activities prone to lay-off during a lockdown (e.g., factory worker). Thus, the latter had to deal with income losses and/or stressors associated with higher risk of being infected with COVID-19, while the former had not faced income losses, and had lower risk of being infected with COVID-19.

It is also possible that, because mandatory lockdown had a six-week duration, and data collection occurred between the third and sixth weeks of the lockdown, an eventual negative impact of COVID-19 pandemic and of governmental measures and its consequences on mental health had not yet occurred. The duration of the lockdown itself may not have been long enough for an effect on mental health to be observed, while an effect might occur if the mandatory lockdown was to be prolonged for additional time. In fact, only two weeks after the beginning of the lockdown, the presumed duration of six weeks of the lockdown was forestalled, as the number of newly confirmed cases with COVID-19 stabilized. This may have given a sense of predictability of the course of the pandemic in Portugal and of the end of the lockdown, which may have decreased the stress experienced because of confinement (Rettie & Daniels, 2020). Thus, confinement may have been felt as more bearable and not exceeding one’s ability and resources to deal with it.

Consistent with previous research on the coping strategies employed to deal with previous epidemics (e.g., Ebola, H1N1, and SARS) (Main, Zhou, Ma, Luecken, & Liu, 2011; Matua & der Wal, 2015; Sim, Huak Chan, Chong, Chua, & Wen, 2010), and with the current pandemic in the USA (Park et al., 2020), acceptance and active coping were among the

three most used coping strategies to tackle stressors during the mandatory lockdown by the study participants. On the contrary, the least used coping strategies were substance use, denial, and behavioural disengagement. These results seem to be inconsistent with previous research about coping with H1N1 epidemic (McCauley, Minsky, & Viswanath, 2013) and with the current pandemic (Park et al., 2020), showing that substance use and denial were among the most commonly used strategies to tackle stressors in the context of this health crisis.

One possible reason for substance use to be one of the least frequently used coping strategies is social desirability. Since substance use is considered a maladaptive coping strategy (Lazarus & Folkman, 1984; Matua & der Wal, 2015; McCauley, Minsky, & Viswanath, 2013; Sim, Huak Chan, Chong, Chua, & Wen, 2010), participants could have reported an answer in a way they deem to be more socially acceptable than would be their “true” answer. Another possible explanation is the fact that the self-reported mental health state by the participants was in the normative range. The fact that they presented good mental health may explain why substance use was not more employed, as predicted. As for denial, Portugal is a country that was affected by COVID-19 pandemic later, compared to other countries in Europe (e.g., Spain, Italy). By the time the pandemic reached us, the Portuguese population had already seen the destruction caused by COVID-19 in other countries and what denial of the disease did. Besides this, as mentioned previously, the sample is highly educated and with access to information, which also hinders the use of denial as a coping strategy. However, a study examining the impact of COVID-19 on stress and coping strategies in individuals with disabilities and chronic conditions revealed that denial and substance use were found to be the least commonly used coping strategy among participants (Umucu & Lee, 2020a).

Finally, we concluded that only positive reframing and humour significantly predicted better mental health, while substance use predicted poorer mental health. One possible line of explanation for the lack of associations between the majority of the coping strategies and mental health is that the type of situation is of major importance (e.g., it might be crucial whether the event is over or still going on). However, the literature provides few findings with respect to the situation effects. Hence, it can be argued that the lack of relation between active coping and planning and mental health might be associated with the high uncertainty and uncontrollability of SARS-related stressors (Gan et al., 2004; Main, Zhou, Ma, Luecken, & Liu, 2011; Umucu & Lee, 2020b), which may limit the effectiveness of active coping and planning in reducing psychological distress (Gonzales, Tein, Sandler, & Friedman, 2001). Acceptance is relevant in situations where a negative event cannot be changed or controlled (Main, Zhou, Ma, Luecken, & Liu, 2011), and even though it was associated with good mental health, it did not predict it independently. Mentally healthy individuals are better at dealing with stress caused by internal or external demands, and at the same time, they react less strongly with negative emotions to stress (Becker, 1992). Considering that the sample’s mental health was normative, and the importance of the situation and the situation-specific reactions were not considered (Nakamura & Orth, 2005), it may be an explanation for why acceptance did not predict better mental health.

Once more, the use of emotional support and instrumental support did not predict mental health. One possible explanation for this is the fact that virtually all people worldwide are facing this pandemic, which may buffer and eventual positive effect of emotional and instrumental support on mental health at the beginning of the pandemic. Further studies are needed to corroborate this hypothesis. Finally, the finding that the use of religion as a coping response is not associated with mental health, although inconsistent with our hypotheses, is in line with the findings of Larson and colleagues (Larson et al., 1992). These authors reviewed 139 research studies focusing on the relationship between religion and mental health and 64% of the reviewed studies have shown the absence of association between any form of religious commitment and mental health (Larson et al., 1992).

On the other hand, while, in line with previous research (Anisman &

Matheson, 2005; Ben-Zur, 2009; Lazarus & Folkman, 1984; Yeung & Fung, 2007), substance use predicted poorer mental health, none of the other coping strategies found in the literature to be maladaptive (e.g., self-blame, denial) was a significant predictor of mental health. Similar results emerged in a recent study assessing the impact of COVID-19 on stress and coping responses in individuals with disabilities and/or chronic conditions (Umucu & Lee, 2020a). This study found that self-blame, but not denial, was a significant predictor of worse psychological function. Umucu and Lee (2020a) noted the inconsistent findings in previous research with regards to the (mal)adaptability of denial as a coping response to stressful events. The authors attribute the absence of a predictive effect of denial on psychological function to the fact that COVID-19 is a new and highly engaging stressor to individuals worldwide, who may see denial as an escape from the hard reality of the current pandemic, of its consequences and of the subsequent government-imposed measures, by drifting individuals’ focus away from experiencing negative emotions and stress. Thus, denial may act as a protection factor in front of such a severe and harsh cluster of stressors, protecting the self from experiencing severe negative emotions and from developing a mental illness in response to it. Future research should examine whether denial, self-blame and other coping strategies that previous research has shown to be usually maladaptive will be correlated with mental health in the long term. In addition, future research should also examine the role of environmental and societal factors and barriers that can influence how people manage the effects of the pandemic.

#### 4.1. Implications for further research and clinical practice

Several areas are worth mentioning. First, it would be important to examine the psychosocial responses of different subgroups in the population that have been affected by the outbreak across different professions and seniority. This would allow us to have a more comprehensive understanding of its impact. Second, longitudinal studies are needed to evaluate changes in psychosocial responses over time and the relationship to demographic profiles. Third, understanding how experiences of previous outbreaks influence current psychosocial responses would allow targeted efforts to enhance these underlying factors. Fourth, knowing the psychosocial responses of different subgroups and how people are coping with government-imposed lockdowns and other social limitations will allow designing proper interventions and perfect measures to deal with the present pandemic. Fifth, at the macro level, it is necessary for the development of comprehensive national programs that promote the use of efficacious coping strategies, such as positive reframing and humour. Finally, early identification and intervention for substance use as a coping strategy and facilitation of adequate coping strategies use that promote mental health.

#### 4.2. Limitations

Our study has several limitations. First, our data is cross-sectional, limiting our ability to draw causal conclusions. Second, we examined a convenience sample, composed by mostly highly educated participants. As a result, we cannot be sure about how well our data would generalize to the rest of the country. Furthermore, data were collected among adults living Portugal, considered by some authors as a collectivist country (Hofstede et al., 2010). We cannot be sure of how well these results would generalize to other individualist countries. Third, our use of self-report allows for the possibility of participant bias, although anonymous self-report has been found to be generally accurate in portraying even negative aspects of individuals’ behaviour (Akers et al., 1983). Finally, the questionnaire was online, and access to the internet might not be equally distributed across socioeconomic, cultural, age, and rural/urban groups.

### 4.3. Conclusion

In conclusion, this study aimed to analyse the mental health status of adults living in Portugal during the national lockdown associated with the COVID-19 outbreak, examine how study participants coped with stress during the national lockdown, and assess the association between coping responses employed during the national lockdown and self-reported mental health status. Findings confirmed the association of a number of coping responses employed to deal with stressors with mental health status, with positive reframing and humour emerging as the most adaptive coping responses. These coping responses should be encouraged by healthcare professionals and targeted in the context psychosocial intervention programs directed to the most vulnerable populations at risk of greater negative psychological impact of the COVID-19 pandemics. Practical considerations for the current pandemic need to focus on the individual in the context of the larger social environment, with an emphasis on raising awareness of the range of possible psychosocial responses, access to psychological help, and effectiveness of coping. Further longitudinal research is warranted to assess the psychological impact of the COVID-19 pandemic over time, and its predictors.

### CRedit authorship contribution statement

**Margarida Jarego:** Investigation, Data curation, Formal analysis, Writing – original draft, Funding acquisition. **Filipa Pimenta:** Conceptualization, Methodology, Writing – review & editing, Funding acquisition. **José Pais-Ribeiro:** Methodology, Writing – review & editing. **Rui Costa:** Writing – review & editing. **Ivone Patrão:** Methodology, Writing – review & editing. **Lina Coelho:** Methodology, Writing – review & editing. **Alexandra Ferreira-Valente:** Conceptualization, Methodology, Formal analysis, Resources, Writing – original draft, Visualization, Supervision, Project administration, Funding acquisition.

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