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Coping strategies used by health-care workers during the SARS-COV2 crisis. A real-world analysis.

Coping strategies used by health-workers

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HIGHLIGHTS

-Sleep disorders and anxiety were the most common symptoms.

- Most of the participants did not believe they were being adequately supported and informed by their superiors or the institution.

- Emotional expression and social support were more frequent among women, and social support seeking was associated with ages 35-50 and was prevalent in Medical, Psychology and Nursing specialisation trainees.

- The distribution of coping strategies was heterogeneous, which indicates the lack of a proper training in coping with stressful situations.

ABSTRACT

The aim of this paper is to analyze the main coping strategies used by frontline teams during the first days of the COVID pandemic confinement in Spain. This information could be necessary in order to carry out training programs that allow a better handling of future emergency situations, as well as acting more effectively and with less negative emotional impact. A questionnaire was used to identify different psychological profiles for coping, and in turn, other relevant variables were analyzed. The most used strategies by health professionals were problem solving, desiderative thinking and social support. Emotional expression and social support were used more by women.

Significantly different behaviors were found in desiderative thinking (lower in people of 35-50 years old, and social support, higher in people 35 years old). The symptoms most commonly experienced by medical personnel were: sleep disorders, anxiety, tension, depressive symptoms, gastrointestinal symptoms and general somatic muscular symptoms.

A relationship could be determined between the age/gender of the workers and the participants' overall assessment of their ability to cope with the COVID-19 stress situation they had experienced (men 50 years old and women between 35 and 50 years old, who felt able or very able to cope with the stress caused by the health emergency. However, women <35 years old and >50 years old believed they were able to cope poorly with the circumstances.

The advantage of specific training plans in order to help with some stress symptoms could be suggested, aimed at the acquisition of tools based on problem solving, and emotional management in stressful and emergency situations.

Key words: Clinical Psychopathology, Ecology, Psychiatry & Mental Health, Psychotherapy

INTRODUCTION:

2020 was a particularly stressful year for the general population, due to the health emergency caused by the SARS-COV2 pandemic. This disease, characterized by acute respiratory distress, started in Wuhan (China) in late 2019 (Tang et al., 2020) and has since spread world-wide (Atkinson & Petersen, 2020), causing the most repercussive pandemic for a century . -The rapid spread, together with a significant lethalness, has left health services stretched to breaking point and health personnel have had to

reorganize themselves to adapt to the situation (Roncero et al., 2020a), in an environment particularly hit by stress and illness (Bohlken et al, 2020), so that the resources with which the emergency situation has been faced have been of particular value in understanding the management of the pandemic in each hospital or in the different medical centers.

Anxiety, stress and insomnia have been described among health workers (Andres-Olivera et al, 2022), the strategies implemented by them have allowed them to face the challenges in a more positive or negative way depending on their personal characteristics, producing various symptoms, and directly affecting their behavior and work performance. Coping strategies are defined as the behaviors that individuals engage in when faced with a stressful situation, in order to reduce the physical or mental threat (from the disease itself) (Johnston & Johnston, 1998). In general, we can say that coping strategies are divided into two groups: those that focus on solving the problem and those that are based on emotional regulation in the face of the problem (Lazarus & Folkman, 1986). These strategies are usually more or less stable patterns of behavior and can give negative or positive results, some being more effective than others for handling certain life situations. For example, being excessively critical of oneself may be less effective than focusing on the problem and taking steps to solve it.

During the Covid-19 pandemic, many groups of health workers were affected by high levels of stress and it has been suggested that coping strategies have played a relevant role (Finstad et al., 2021; Huang et al., 2021; Labrague, 2021; Riedel et al., 2021). Analyzing the effects in the mental health of the general population (Bhattacharjee & Acharya, 2020) up to now and how these difficulties were dealt with, or the coping strategies used, can be beneficial for the future , especially for health workers, since the rest of the population depends on them in critical situations such as a pandemic. It should be borne in mind that the term strategy refers to a type of behavior that can be modified, even though it may be clearly influenced by personality, and analysis of it will enable the design of appropriate emergency preparation programs from the perspective of mental health promotion and appropriate occupational support networks.

The overall objective of this research was to estimate the different coping strategies of health workers during the first days of pandemic confinement, according the sociodemographic variables, the professional background and position, and the risk of

infection in the area in which they worked, as well as the identification of symptoms that could be related to these strategies and other relevant study variables.

METHODOLOGY

AIM

To assess the stress coping strategies that became evident during the COVID-19 epidemic by healthcare workers at University of Salamanca Health Care Complex, managed by Castilla y León's Public Health Service (SACYL), as well as by healthcare workers at other centers outside of SACYL. Since there were no established protocols for a situation like this, it is considered essential to analyze this kind of situation–in order to develop appropriate action and coping plans, and also fundamentally to help other services with the emotional overload they may be suffering due to the important healthcare responsibility that befalls them for future similar scenarios.

METHODS

This is an observational, descriptive, cross-sectional study. Data were obtained from a sample of health professionals from Salamanca (Spain). It was a voluntary survey and there were not any incentives offered to complete this. Responses were collected from Mar, 23 to May 22, 2020 virtually by means of an Outlook Forms questionnaire sent to each of the participants. There was a direct link from the hospital staff web site. The College of Nursing also collaborated in its distribution. The authors designed an ad-hoc questionnaire based on references in the relevant literature, including 73 closed-ended questions (See appendix 1). The first questions (items 1-40) contained an adapted coping strategies questionnaire (Coping Strategies Inventory, CSI) (Cano et al., 2007.; Tobin et al., 1989.).

The survey was sent to all health professionals from Salamanca (multi-background professionals. A total of 286 subjects did the survey. Since the survey could be completed without being completely answered, 17 responses with a lot of incomplete items had to be excluded from the analysis. Finally, 269 surveys were considered for data analysis. In some variables it was not possible to collect the response of all the participants. This is the reason why the sample size is specified in each of the variables collected. Moreover, there were two versions of the questionnaire. The first 25 patients had a smaller number of questions. Additional questions were added after patient 26. Some answers about the family situation were not answered in the first version.

After answering the questionnaire about how they were coping with the pandemic situation, participants were informed about the PASMICOR program that was being carried out at the Hospital to help professionals who were in a critical mental situation due to the pandemic (University of Salamanca Health Care Complex, 2020). The Psychiatry Service of the University Hospital of Salamanca intended to detect and approach situations of mental health alteration associated with the COVID-19 pandemic. From this Unit, the PASMICOR protocol was developed that offers mental health care to health personnel who find themselves in this highly complex situation, to alleviate the suffering and health problems that may be caused. This Service was carried out by Psychologists from the Clinical Psychology Area of the CAUSA Psychiatry Service who contacted the people who requested it and will carry out psychological care by telephone.

Variables

Coping Strategies

In this study the Coping Strategies Inventory (CSI) was employed (Tobin et al , 1989), adapted into Spanish by Cano et al. (2007) .It is divided into two parts: a first qualitative part in which the subject describes a recently experienced stressful situation (this part was not use in this study because all the subjects were interviewed in relation to the same situation (pandemic)), and a second quantitative part in which the use of various strategies to cope with the pandemic situation is assessed through the response to 40 items. The 40 items that make up the questionnaire adapted to Spanish and the situation are rated on a Likert scale (1 = "Not at all", 2 = "A little", 3 = "Sometimes", 4 = "Often" and 5 = "Totally") . These are organized around a factor structure composed of 8 latent factors, which refer to generic coping strategies for stressful situations (Cano et al., 2007). In turn, according to Tobin et al. (1989) these strategies are grouped into hierarchical dimensions that are classified into coping strategies focused on managing the problem or emotions and appropriate or inappropriate strategies.

The 8 latent factors measured are explained below:

- (i) *problem solving*, behavioral and cognitive processes to discover, analyze and solve problems, and thus eliminate stress by modifying the stress-provoking situation.

- (ii) *cognitive restructuring,* cognitive strategies that modify the meaning of the stressful situation, frustration or emotional discomfort.
- iii) *social support,* strategies focused on seeking emotional support and refuge in others to cope with the stressful situation.
- iv) *emotional expression,* strategies used to release and communicate the emotions that arise.
- v) *problem avoidance,* strategies for denial or avoidance of thoughts related to the stressful event.
- vi) *desiderative thinking,* cognitive strategies that embody the wish that reality was not stressful.
- vii) *social withdrawal,* strategies of withdrawal from interaction with emotionally significant people, such as family and friends, in order to face problems in solitude.
- viii) *self-criticism,* strategies of self-appraisal or based on self-blame for inadequate handling of the stressful situation and mistakes made.

The score of each individual in the latent constructs of coping strategies was calculated from the sum of the scores of the items that made up each of the factors (Cano et al., 2007). In this way, the range of scores for any of the subscales oscillates between 0 and 20 points, since all the items are scored in the same direction.

In the following table we can see the test items that were considered for each coping strategy.

[Insert Table 1]

- In addition to these first 40 items, subjects answered an additional item about perceived coping self-efficiency. The wording of the questions had been trivially modified to fit the situation caused by the SARS-CoV2 outbreak.

Age and gender

The age and sex of all participants were collected. For a better analysis, age was distributed into 3 groups (under 35 years old, subjects between 35 and 50 years old and subjects over 50 years old).

Anxiety related symptoms reported by the participants

The participants were asked about the presence or absence during this period of some symptoms related to stress and anxiety.

Professional category

The subjects reported their professional category, also indicating whether they worked in the public or private sector, in order to analyze whether this could influence how they handled the stressful situation. Information was also collected on the Unit where they worked, distinguishing between Units or Services with a high risk of contagion by Covid-19 and those in which there was less risk.

Working conditions and occupational satisfaction

Information was collected on working conditions in the last 62 participants who completed the survey, to see how these conditions could influence the way of coping with the crisis. Some questions were used to check how the subjects were coping with the work situation (items from 56 to 65).

Others:

Other additional questions were added: The health workers then answered questions about their health status in relation to Covid-19, Information on whether they lived with COVID patients or if any family member or infected person was in a serious state of health due to it… All these additional questions were considered for study due to their possible influence on coping with the situation.

Statistical Analysis

The one-sample Kolmogorov-Smirnov test was used to analyze the distribution of quantitative variables. From this, variables that were normally distributed were summarized by mean and standard deviation (mean (SD)), while otherwise they were described by median and interquartile range (IQR). The information from the qualitative variables was explained by absolute frequencies and percentages. In the case of parametric variables, differences between independent groups of staff were examined using Students' t-test for differences between two groups, or ANOVA for differences between more than two groups. In all cases, non-parametric tests were applied to look

for significant differences as non-normally distributed variables. The Mann-Whitney U test was used for the variables of gender and area of work, and the Kruskal-Wallis test was used for the study of differences between age groups and jobs held.

The relationship between each pair of CSI questionnaire items is measured by Pearson's correlation coefficient. The relationship between qualitative variables is examined by means of the Chi-Square test or Fisher's exact test, as appropriate. When the relationship between two pairs of categorical variables is significant, the contingency table information between the two can be represented in a reduced dimension space using Simple Correspondence Factor Analysis (CFA). CFA is a multivariate data analysis technique that allows the frequencies of characteristics in a contingency table to be plotted on a scatter plot (usually two-dimensional). Thus, two close points on the graph will correspond to two categories that are strongly and directly related.

The reliability of the adapted questionnaire CSI was analyzed using Cronbach's α coefficient which resulted in high internal consistency for each of the dimensions (PS α =0. 85, EE α =0.74, SS α =0.82, CR α =0.78, SC α =0. 83, DT α =0.82, PA α =0.64, SW α =0.72). Each individual's score on the latent coping strategy constructs was calculated from the sum of the scores on the items that made up each of the factors. (F. Cano et al., 2007). Thus, the range of scores for any of the subscales is between 0 and 20 points, as all items are scored in the same direction.

The study was considered statistically significant when the between-group comparison resulted in p-values of less than 0.05 (significance level $\alpha = 0.05$) throughout the study. Statistical analysis was carried out using SPSS statistical software version 22.0 for Windows and the free software R version 3.5.2.

Informed Consent.

All procedures followed were in accordance with the ethical standards to be verified and after authorization from the relevant centers. In accordance with the provisions of Organic Law 3/2018, of the 5th of December, on Personal Data Protection and guarantee of digital rights, participants were informed that their data would be treated confidentially, avoiding their identification. The questionnaire highlighted the voluntary nature of participation in the study and the need for individual consent, as well as the possibility of withdrawal at any time without negative consequences. All participants voluntarily agreed to collaborate in the research, once informed consent was accepted.

Data protection:

Only first and last authors were allowed to access the data base in order to protect the confidentiality of the participants.

RESULTS

Sample

The sample consisted of 269 people, mainly women (n=190, 72%). The median age of the study group was 46 years old, most being older than 35 (79.3%) **Table 2.** 10% of the responses were obtained from the Salamanca College of Nursing, while 90% were obtained from the Salamanca University Hospital staff and other centers outside of SACYL. 92.5% of the participants work in the public sector. In terms of the positions they hold, 5.3% are heads of unit/service, 53.4% are doctors, 15.6% are nurses, 7.3% are assistants and 8.8% are doctors and nurses in training (assistants). Almost half of the sample were working in a unit with a high probability of COVID-19 infection at the time of the questionnaire's response (49.3%). In addition, 23% of them have shown symptoms of COVID-19 and 7.1% are on sick leave due to the virus.

[Insert Table 2]

Anxiety related symptoms reported by the participants

The frequency of symptoms reported by the participants is shown in Table 3. The symptoms most commonly experienced by medical personnel were: sleep disorders, anxiety, tension, depressive symptoms, gastrointestinal symptoms and general somatic muscular symptoms. Notably, 6% of the sample increased their use of alcohol and/or other substances to relax and 5% had thoughts of death, although not related to COVID-19. 4.6% (n=11/239) of the sample were already under mental health unit treatment and 24.4% (n=21/86) took benzodiazepines to calm anxiety during confinement. 68.6% of the participants stated that they believed this situation would leave psychological after-effects.

[Insert Table 3]

Working conditions

[Insert Figure 1]

Figure 1 shows the opinion of 269 participants about their working conditions and occupational satisfaction during their working day, assessed by their agreement or disagreement to several items. At a general level it can be concluded that participants did not believe they were receiving adequate support (40,3% reported agreed item 62: I do not feel accompanied by the institution when labor problems arise) and instructions (67,9% subjects reported agreed item 58: managers frequently transmit contradictory messages) in their job.

[Insert Figure S1]

A significant relationship (p=0.013) was found between the levels of anxiety that workers displayed and the item 63 (I feel a little insecure about the activities I should do), with greater anxiety in those who felt more unsure (Figure S1).

Coping Strategies for Stressful Situations owing to COVID-19

The most used strategies by health professionals were problem solving, desiderative thinking and social support.

Table 4 shows the results of the descriptive analysis of the frequency of use of the coping strategies of the CSI scale according demographic and professionals variables and the risk of infection in the service where they worked. The values represented in the table are means and standard deviations of each construct.

[Insert Table 4]

- Gender and age

In terms of the participants' gender, the differences were significant (p-value= 0.000) in emotional expression and social support (p-value= 0.03), both of which were used more by women. With respect to age, significantly different behaviors were found in desiderative thinking (p-value= 0.008), lower in people of 35-50 years old, and social support (p-value= 0.008), higher in people 35 years old.

A relationship could be determined between the age/gender of the male workers under 35 y.o. (3%), between 35-50 y.o (10%), over 50 y.o. (17%) and women under

(35 y.o.(17%), aged 35-50 y.o.(30%) and over 50 y.o.(22%) and the participants' overall assessment of their ability to cope with the COVID-19 stress situation they had experienced (X^2=31; p=0.05). The CFA allowed examination of the relationship between the afore-mentioned CSI questionnaire item categories with the age and gender of health staff in a two-dimensional space explaining 81.4% of the variability (**Figure 2**). Taking into account that the distance between points is interpreted as a direct relationship between categories, it can be concluded that men 50 years old felt able to cope with the situation, and women between 35 and 50 years old, who felt fully able or very able to cope with the stress caused by the health emergency. However, women <35 years old and >50 years old believed they were able to cope poorly with the circumstances.

Thanks to the Simple Correspondence Factor Analysis, in the following figure we can graphically observe how the gender and age categories were related to this item.

[Insert Figure 2]

- Professional category

According to the results obtained, the strategies most frequently used by doctors/physicians were, in order, desiderative thinking (DT), problem solving (PS), social support (SS), emotional expression (EE) and cognitive restructuring (CR). In the case of nurses, problem solving (PP), desiderative thinking (DT) and social support (SS) were most used.

Statistically significant differences in social support were found (P-value =0.049) depending on the position held. This strategy was most commonly used by Medical, Psychology, and Nursing specialization trainees.

- Risk Infection Area:

Finally, taking into account the risk of infection in the area in which they worked, the differences were significant in problem solving and self-criticism, being higher in those people located in units with a high risk of COVID-19 contagion.

- Need of training:

42 participants responded to the item 67 ("Are you feel that you would need more training to be prepared for situations like this"). Of all of them, 86% indicated that prior training for these situations could be beneficial for them.

Correlation between CSI items:

The analysis of the correlations between the different items of our adapted CSI questionnaire allows us to conclude that the items of the same sub-scale are directly related, with the exception of the Problems Avoidant items, whose relationship is lower (in accordance with the lower reliability found in this factor).

[Insert Figure S2]

DISCUSSION

The data from this study shows heterogeneity in the strategies used. The most used strategies by health professionals were problem solving, desiderative thinking and social support. Emotional expression and social support were used more by women.

Age differences were found in desiderative thinking (lower in people of 35-50 y.o., and social support, higher in people 35 y.o), and was the most commonly used by Medical, Psychology, and Nursing specialization trainees. Finally, taking into account the risk of infection in the area in which they worked, the differences were significant in problem solving and self-criticism, being higher in those people located in units with a high risk of COVID-19 contagion. A relationship could be determined between the age/gender of the workers and the participants' overall assessment of their ability to cope with the COVID-19 stress situation they had experienced (men 50 y.o. and women between 35 and 50 y.o., who felt able or very able to cope with the stress caused by the health emergency). However, women under 35 years old and over 50 y.o believed they were able to cope poorly with the circumstances. Problem solving and self-criticism being higher in those people located in units with a high risk of COVID-19 contagion. It also was found that symptoms such as sleep disorders, anxiety, tension, depressive symptoms, gastrointestinal symptoms and general somatic muscular symptoms were associated with the stressful situation. Finally, 86% of respondents reported they would need more training to be prepared for situations like this in the future.

Different coping strategies used and their relation to other variables

According to the data, desiderative thinking was one of the most frequently used forms of coping. This kind of thinking was related to age. Similar data were found in other populations (de Minzi, 2005; Garbóczy et al., 2021). It is easy to think that age or experience can play a fundamental role in this respect, as it might in other day-to-day situations, in which the succession of life events prepares us to face new situations in the future.

Previously it has been described that problem-focused solution seeking may increase the sense of control and emotional management in critical situations (Shermeyer et al., 2019).

As well, social support was also an important strategy during the pandemic, and was related to other variables such as gender, age and position. As we have shown, this strategy was fundamental in medical workers in training and among nurses. This pandemic has been a unique learning opportunity for many medical students and other specialties, although this learning also requires good support from more specialized staff (Brand, 2020; Chew et al., 2020). Team leaders helping more junior professionals can provide a high level of psychological support by helping to normalize psychological crisis situations and facilitating support and self-care strategies that benefit the whole service (Blake et al., 2020).

The situation of isolation may explain why the need for social support became evident during the COVID pandemic to cope with stress (Thoits, 2011). Social support networks have previously been described as fundamental for emotional management and facilitated the individual's own natural resources to adapt to situations (Khan & Husain, 2010; Hernández et al., 2019; Saltzman et al., 2010).

Fortunately, the least used strategies were social withdrawal, problem avoidance and self-criticism, regardless of the group (Khan & Husain, 2010). Despite such high stress, human beings have natural resources to adapt to some extent to situations, and positive attitude has been reported in other studies as a protection factor to face problems (Babore et al., 2020; Dehon et al., 2021).

Self-criticism was a behavior related to the area in which staff worked. This mental resource may have been facilitated by the lack of prior training for situations of mass infection, and by the feelings of worry and guilt that some health workers had when assessing the risk of infection, either for themselves or for their families (Ali et al.,, 2020). In addition, the accumulated stress and lack of sleep could lead to involuntary

risk-taking behavior or a perceived loss of effectiveness at work (Kalmbach et al., 2017), which would be reinforced by the high mortality rates reported during this period.

Age and Gender

Age has been shown to be a variable that influences the strategies used (Aldwin, 1991; Chen et al., 2018), reflecting the role of self-efficiency throughout the life cycle (Trouillet et al., 2009). This could explain the results which found that middle-aged women (35-50) were more able to cope with the situation than other women maybe because social support networks have also been shown to be stronger in mid-life (Trouillet et al., 2009), which could also contribute to a sense of well-being and determine positive coping strategies in an emergency situation.

As has been seen, gender plays an important role in this respect (Nolen-Hoeksema, 2012), showing a significant relationship with coping strategies focused on emotional management. Similar results have been found in other studies with respect to gender and age, showing that women focus more on emotional coping and seeking social support, while men focus more on problem solving (Trouillet et al., 2009). In this study, men felt more able to cope with the pandemic regardless of age, while women <35 and >50 years, felt they had great difficulty in doing so, highlighting the variability in stress management between men and women. There is not a clear explication to the fact that women in middle age were less able to cope with this stressful pandemic. However, it could be hypothesized that external factors such as family-care role could play a role.

Anxiety related symptoms reported by the participants and the impact on their mental health

In general, all healthcare staff worked in units with a high probability of SARS-COV-2 infection (Brand, 2020) , which generated very high levels of stress (Li et al., 2021). Moreover, public services in general tend to be more stressful for workers when there are health emergencies. This is especially relevant in the Spanish public health System, where health care is free, resulting in massive attendance at the centers. This would explain the fact that wide-ranging symptoms associated with the presence of sleeping difficulties, anxiety, tension, gastro-intestinal symptoms and general somatic symptoms, appeared in a very significant percentage of the participants. These results are consistent with other studies in which similar mental problems (Brand, 2020) such

as depression (Li et al., 2021) and other symptomatic manifestations were obtained (Bohlken et al., 2020; Huang & Zhao, 2020), showing that certain strategies can result in a decrease in symptoms and an increase in well-being (Loukzadeh & Mazloom, 2013; Bohlken et al., 2020; Rajkumar, 2020; Budimir et al., 2021; Molero-Jurado et al,2021)

High levels of work-related stress and fatigue have been widely reported in hospital settings (Chang et al., 2007; Brown et al., 2018). The feelings of stress may also be increased in the COVID pandemic in those workers who are not specialized in infectious situations (Kuki et al., 2020), so the importance of adequate emotional support for health staff on the front line of battle and various strategies to help manage work-related stress should be recognized (Kar et al., 2020; Roncero et al., 2020b). As Burnout syndrome is admitted to by many healthcare professionals who have found themselves working during this pandemic, a fundamental task should be to give emotional support to healthcare professionals to prevent them from becoming future patients of the pandemic (Perlis, 2020). Proper physical protection of staff (El-Hage et al., 2020), and adequate work distribution with clear performance objectives could be other key tools to manage problem-solving behaviors and thus avoid the uncertainty that produces anxiety behaviors.

The lack of learned strategies focused on problem solving or emotion management, and the absence of specialized emergency crisis management services, probably led to the use of alcohol or benzodiazepines at certain times to calm anxiety during confinement (Stuijfzand et al., 2020). The use of substances as a strategy from health workers to cope with stress has already been addressed previously in another research (Foli et al., 2021; Jewell et al 2021; Smallwood et al, 2021).

The difficulty in managing emotions became evident when most of the subjects indicated that the situation would leave them with psychological after-effects. This pandemic has caused a high psycho-social impact worldwide (Li et al.,, 2020) and changes in the mental health of individuals (Rajkumar, 2020; Vanhaecht et al., 2021). This highlights the need for the creation of specialized units to support the frontline professionals who underpin the foundation of medical care. Anxiety levels were related to workers' reported un-sureness about how to act in the pandemic. Healthcare workers' working conditions and the effective management of human resources have seemed to influence the behaviors or emotional states of the subjects providing care to others,

demonstrating the great vulnerability of our management systems in terms of risk prevention.

Health crises are shocking events that alter the normal life of the subjects (Wang et al., 2020), causing their quality of life to deteriorate temporarily, provoking emotional effects that could be mitigated with appropriate training programs or specialized services that collaborate during these situations. Interventions on an institutional level such as specific trainings and institutional support and strict organization have already been suggested by other authors (Bendau et al, 2021; Franco & Levi, 2020). It would also be useful to know the mental state of each worker during times of crisis, in order to recognize possible stress-related problems in time, and to reduce absences due to inadequate emotional management. Therefore, these assessments to detect anxious thoughts should be carried out continuously with staff in these emergency situations (Spoorthy, 2020).

Problem-focused coping is the most appropriate strategy for this type of situation, while emotion management should be the second battle we face in an emergency situation.

Other authors have proposed for managing stress some therapies based on physical and mental well-being, such as physical exercise, yoga, meditation, relaxation techniques. Praying also showed positive results during these stressful situations (Goyal et al., 2014; Saeedet al., 2019) as well as the pandemic (Rahman, 2022; Sahni et al., 2021; Upadhyay et al., 2021) so they should not be ignored.

To sum up, all these results have shown some shortcomings of our health workers when facing very stressful situations, so the possible advantage of adequate training to act in emergency situations could be suggested. This idea is supported by other authors who have recommended that mitigating maladaptive behaviors (Hahad et al., 2020; Perlis, 2020) and facilitating strategies focused on problem-solving and adequate emotional management could increase the management of this kind of situations (Cochran et al., 2020).

Limitations

Some limitations of this study should not be overlooked when interpreting its results. Firstly, the study was limited to a specific geographical area, largely single-centered, so that the particular management and epidemiological characteristics of the area may have limited the heterogeneity of the data. The fact that doctors were

predominant in the sample as a professional category may also have influenced coping strategies.

With regard to the variables analyzed, we can indicate that the questionnaires were not specifically designed for this kind of emergency and therefore, the adaptation made for SAR-COV may make it difficult to compare with other situations for which it was designed. In the same sense, the pressure on the design of the questionnaires may have limited the creation of a questionnaire with other more specific complementary variables that would have increased the wealth validity of results.

Regarding the data collected, another limitation is that the questionnaire could be completed without completing all the answers. This generated numerous missing data in several variables, and could have affected the general analysis of the sample. Also, due to the fact that the questionnaire was not retaken, we cannot determine whether the coping strategies were inherent to the personality of the respondents or whether they were responding to this specific situation (Christopher Perry et al., 2013). Finally, it is worth mentioning that the use of self-administered questionnaires, could prevent a comprehensive and homogeneous assessment of the mental state of the subjects.

Strong points

This is a study about the impact and coping strategies in a real-world so these results should be taken into account. The evaluation of the situation and our own coping resources determine our resilience in different situations. The important thing about this feature is that it can be trained and modified to better handle situations.

Conclusions

The data from this study shows heterogeneity in the strategies used. The most used strategies by health professionals were problem solving, desiderative thinking and social support. Emotional expression and social support were used more by women.

It has been shown that there are very important differences in how we handle problems when we face situations using problem-focused or emotion-focused strategies, as well as the relevance of gender and age. This difference can lead to appropriate handling of the problem and the situation, or on the contrary, to inadequate and less effective and functional coping influencing our mental health and producing associated stress symptoms. We suggest that training the subjects in the management of the problem and in an adequate emotional could mitigate maladaptive behaviors increasing the resilience

resources, making healthcare workers better prepared to cope safely with future pandemics or stressful situations. This management is crucial for health professionals who are the first line of defense in health emergencies, and because the general population depends on them to face any future public health problems.

DISCLOSURE STATEMENT

DECLARATION OF INTERESTS

Dr. Carlos Roncero has carried out the PROTEUS project, which was funded by a grant from Reckitt-Benckisert/Indivior and the COSTEDOPIA project, which was funded by INDIVIOR. He received two medical education grants by Gilead and medical writing support from Abvvie, has received fees to give lectures for Janssen Cilag, Indivior, Servier, GSK, Astra, Gilead, MSD, Sanofi, Exceltis, Abbvie, Takeda Rubio and Casein. He has received financial compensation for his participation as consultant or a board member for Lundbeck, Gilead, MSD, Mundipharm, INDIVIOR, Exceltis, Martindale, Camurus, Gebro and Abbive, and has received support by Castile and Leon's (Spain) Regional Management of Health (GRS COVID 59/A/20) Scholarship for the project "Impacto y abordaje de la salud mental de los pacientes afectados por COVID, sus familiares y del personal sanitario que los atiende" (Impact and approach on the mental health of patients affected by COVID, their families and the health professionals who care for them).

Dr. Javier I. de la Iglesia-Larrad has received honoraria for a presentation for Sanofi and has been given formation and a contract for La Roche as a rater in a clinical essay.

Dr. Angel Luis Montejo received consultancy fees and honoraria/research grants in the last five years from Boehringer Ingelheim, Forum Pharmaceuticals, Rovi, Servier, Lundbeck, Otsuka, Janssen Cilag, Pfizer, Roche, Instituto de Salud Carlos III and Junta de Castilla y León.

The rest of the author declare to have no other conflicts of interest.

AUTHOR CONTRIBUTIONS

Barbara Buch-Vicente, Carlos Roncero: Conception and design of the study.

Barbara Buch-Vicente, Jose Maria Acosta-Rodríguez, Maria Elena Sanchez-Sanchez, Llanyra Garcia-Ullán, Nerea Gonzalez-Garcia, Angel Luis Montejo, Carlos Roncero: Acquisition and analysis of data.

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Javier de la Iglesia-Larrad, Llanyra Garcia-Ullán: Drafting the manuscript or figures
Barbara Buch-Vicente, Angel Luis Montejo, Carlos Roncero: Review and supervision of the manuscript.

AUTHOR STATEMENT

Barbara Buch-Vicente, Angel Luis Montejo, Carlos Roncero: Conception and design of the study.
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conflicts of interest

NOne

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Table 1. Coping strategies and items

Coping strategy	items considered for each factor
problem solving (PS)	1, 9, 17, 25, 33
cognitive restructuring (CR)	6, 14, 22, 30, 38
social support (SS)	5, 13, 21, 29, 37
emotional expression (EE)	3, 11, 19, 27, 35
problem avoidance (PA)	7, 15, 23, 31, 39
desiderative thinking (DT)	4, 12, 20, 28, 36
social withdrawal (SW)	8, 16, 24, 32, 40
self-criticism (SC)	2, 10, 18, 26, 34

Table 2.*. Socio-demographic and clinical characteristics of the staff at Salamanca Hospital and the Official College of Nursing during the COVID-19 epidemic in Salamanca (2020)*

Characteristics	N	F
Age, Me (IQR)	266	46 (21)
< 35, n (%)		55 (20.7%)
35-50, n (%)		106 (39.8%)
> 50, n (%)		105 (39.5%)
Sex (female), n (%)	264	190 (72%)
Sector	255	-
Public, n (%)		236 (92.5%)
Private, n (%)		15 (5.9%)
Other / Not applicable		4 (1.6%)
Position held	262	-
Head of Unit / Service, n (%)		14 (5.3%)
Medical / Faculty member, n (%)		140 (53.4%)
Nurses, n (%)		41 (15.6%)
Assistants, n (%)		19 (7.3%)
Medical / Psychological / Nursing specialist		23 (8.8%)

trainees n (%)		
Others, n (%)		25 (9.5%)
Service	268	-
Unit with high COVID-19 infection risk, n (%)		132 (49.3%)
Unit with low COVID-19 infection risk, n (%)		101 (37.7%)
COVID-19 symptoms, n (%)		62 (23%)
Detection test, n (%)	86	19 (7.1%)
Quarantined on suspected COVID-19, n (%)	86	5 (5.8%)
Temporary leave due to COVID-19, n (%)	268	19 (7.1%)
Individual cohabitation, n (%)	247	58 (23.5%)
Family with COVID-19, n (%)	86	26 (30.2%)
Family with acute/severe COVID-19, n (%)	86	7 (8.1%)
Family lost to COVID-19, n (%)	86	15 (17.4%)

Table 3.*. Frequency and percentage of different levels of stress and anxiety according to various factors during the COVID-19 health emergency of different health collectives in the province of Salamanca, Spain, 2020.*

	n	f (%)
Anxiety (worries, fears, apprehension, irritability)		155 (57.6)
Level of anxiety, Me (IQR)	242	6 (3.25)
Depressive symptoms (tendency to crying, sadness…)		86 (32%)
Cognitive problems		68 (25.3)
Cardio-vascular symptoms		53 (19.7%)
Gastro-intestinal symptoms (disuffagia, flatulence, dyspepsia, bloating, increased bowel movements, diarrhea, weight loss, constipation, loss of appetite)		78 (29%)
Genito-urinary symptoms		14 (5.2%)
Respiratory symptoms		56 (20.8%)

General somatic (muscular) symptoms (muscle pain, muscle stiffness, muscle twitching, clonic convulsions, bruxism, wavery voice)	76 (28.3%)
General somatic symptoms (sensory)	32 (11.9%)
Vegetative symptoms	50 (18.6%)
Fears	24 (8.9%)
Tension (inability to relax, tendency to startle, trembling and restlessness)	148 (55%)
Sleep disorders (difficulty falling asleep, interrupted sleep, unsatisfactory sleep, tiredness on waking, daydreams, nightmares, night terrors)	160 (59.5%)
Thoughts of death not related to COVID-19	14 (5.2%)
Increased alcohol & other substance use	16 (5.9%)

*n of 269 participants who responded this item

Table 4. *Descriptive and between-group comparisons of coping strategies on the CSI questionnaire*

	PS	SC	EE	DT	SS	CR	PA	SW
Sex								
Women (n=190)	14 (6)	3.5 (5)	7 (5)	15 (7)	11 (7)	8 (6)	4 (4)	5 (5)
Men (n=74)	12 (5.3)	3 (4)	5 (4)	14 (6.3)	8.5 (6)	7.5 (5.3)	5 (3)	6 (5)
p-value	>0.05	>0.05	0.000**	>0.05	0.03*	>0.05	>0.05	>0.05
Age								
<35 (n=55)	15 (7)	3 (5)	7 (7)	16 (7)	12 (6)	9 (6)	4 (5)	5 (5)
35-50 (n=106)	14 (6)	2 (4)	7 (4)	14 (6.5)	10 (6.3)	8 (5)	4 (3)	5 (5.3)
>50 (n=105)	12 (6)	4 (5)	7 (6)	16 (6)	10 (6.5)	7 (5)	4 (4)	5 (5)
p-value	>0.05	>0.05	>0.05	0.008**	0.008**	>0.05	>0.05	>0.05
Position held								
Head of unit / service (n=14)	14.5 (5.3)	1.5 (5)	6 (6.5)	14 (7.5)	10.5 (7.5)	10 (7.5)	3.5 (2)	3.5 (4.8)
Medical / Faculty member	12.5 (6)	3.5 (5)	7 (4.8)	15 (6)	10 (6)	7 (5)	4 (4)	5 (5)
Nurses, n (%)	15 (8)	3 (6)	8 (5.5)	14 (7.5)	12 (5)	9 (3.5)	4 (4)	4 (4)

Assistants, n (%)	15 (7)	3 (5)	6 (5)	17 (6)	9 (7)	9 (7)	5 (5)	7 (6)
Medical / Psychological / Nursing specialist trainees n (%)	13 (6)	4 (5)	6 (8)	13 (12)	11 (6)	9 (5)	5 (5)	4 (7)
p-value	>0.05	>0.05	>0.05	>0.05	0.049*	>0.05	>0.05	>0.05
Service								
Unit with high COVID-19 infection risk, n (%)	14.5 (6)	4 (6)	7 (5)	15 (7)	10 (6.8)	8 (5.8)	4 (4)	5 (6)
Unit with low COVID-19 infection risk, n (%)	12 (7)	2 (4)	7 (5.5)	13 (8)	10 (6)	7 (6)	4 (3.5)	5 (5)
p-value	0.006**	0.003**	>0.05	0.056	>0.05	>0.05	>0.05	>0.05
Barometer (Cano et al. 2007)	16	3	9	12	11	10	5	3

PS: problem solving; SC: self-criticism; EE: emotional expression; DT: desiderative thinking; SS: social support; CR: cognitive restructuring; PA: problem avoidance; SW: social withdrawal

*The individuals' scores on each of the coping scales have been obtained from the sum of the items that make up each of the latent dimensions and specified in the methods section. They are converted into quantitative scores that oscillates between 0 and 20 points, since all the items are scored in the same direction.

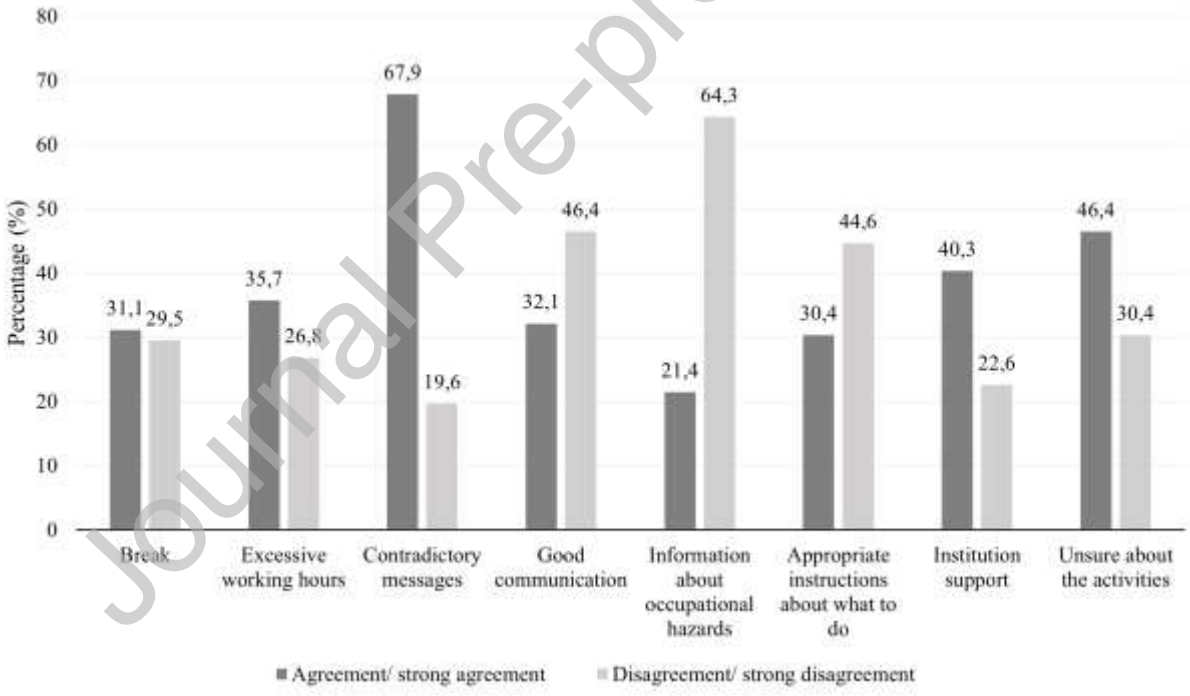

Figure 1 *Working conditions among medical personnel*

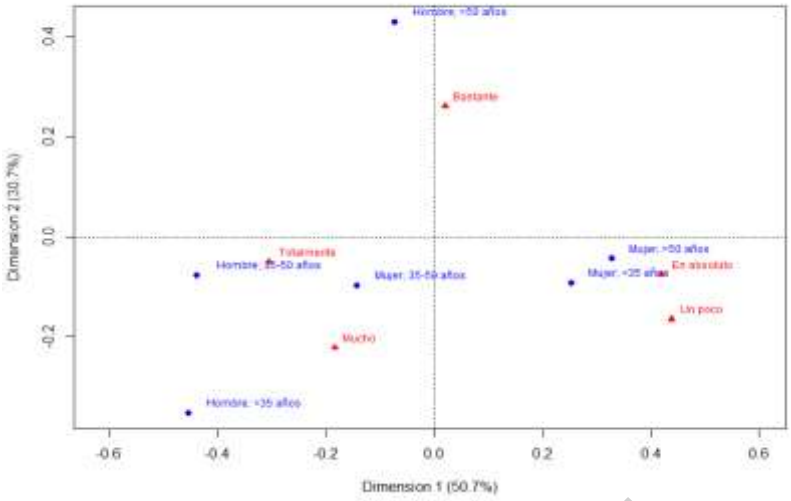

Figure 2. *AFC graphical representation of the variable categories: Global CSI ("I consider myself capable of coping") (red) vs Gender/Age (blue).*