Ansiedad y Estrés 29(3) (2023) 137-143

Ansiedad y Estrés

https://www.ansiedadyestres.es

Original

Post-traumatic Stress Disorder after the first wave of the Pandemic in Hospitalized COVID-19 Patients and Health Professionals in a Front-line Spanish Tertiary Hospital: a retrospective observational study

Irene Rodrigo Holgado[a], Carolina Elisa Combarro Ripoll[b], Alba Juanes González[b], María Jesús Del Yerro[c], Sara Solera Mena[d], Gabriel Rubio[e, f], and Juan D. Molina[e, f, g, h, j]

[a] *Clinic Psychologist, COVID-19 Assistance Project, Psychotherapy Unit, 12 de Octubre University Hospital*
[b] *Psychiatrist, COVID-19 Assistance Project, 12 de Octubre University Hospital*
[c] *Psychiatrist, Adult Interconsultation and Liaison Unit, 12 de Octubre University Hospital*
[d] *Clinic Psychologist, Adult Interconsultation and Liaison Unit, 12 de Octubre University Hospital*
[e] *Research Institute Hospital 12 de Octubre (i + 12)*
[f] *Department of Psychiatry, Faculty of Medicine, Complutense University of Madrid*
[g] *Centro de Investigación Biomédica en Red (CIBER) Salud Mental, Madrid*
[h] *Villaverde Mental Health Center, Clinical Management Area of Psychiatry and Mental Health, Psychiatric Service, 12 de Octubre University Hospital*
[j] *Facultad de Medicina, Universidad Francisco de Vitoria*

ARTICLE INFO

Article history:
Received 27 March 2023
Accepted 23 August 2023
Available online 3 Octubre 2023

Keywords:
COVID-19
Pandemic
First wave
Post-traumatic stress disorder
PTSD
Healthcare professionals
Infection survivors
TOP-8

A B S T R A C T

The COVID-19 pandemic had a serious impact on mental health, associated with Post Traumatic Stress Disorder (PTSD) after infection and within healthcare professionals. We propose to compare the semiology, evolution and trauma-associated variables between both groups in a sample of patients. An observational retrospective study was performed, including 42 hospitalized COVID-19 patients and 31 health professionals, treated at the Mental Health Service of the Hospital 12 de Octubre, between June 2020/21, with a diagnosis of PTSD. Mental state evaluation was performed through a standard clinical interview. Additionally, the 8-item treatment-outcome post-traumatic stress disorder scale (TOP-8) was administered. Demographic data, variables related to hospital stay and pre/peri/post-trauma variables considered of interest were collected. All analyses were performed using the Stata 16 program. Health professionals showed higher levels of recovery, however no significant differences were found in the initial severity of the PTSD. Regarding the symptom pattern it was similar between both groups, except that professionals presented more dissociation during the traumatic event. In general, the subjects presented mainly intrusive symptoms, hyperarousal and sleep-related difficulties. Having witnessed suffering or death, and the gypsy ethnic group, were the variables with the greatest impact in the PTSD severity. These results suggest that the COVID-19 leaves important psychological sequelae such as PTSD, both in infection survivors and in health professionals. Differences found could be due to dissimilarities in coping resources and therapeutic adherence styles. We consider that knowing the variables involved can help improve intervention in these vulnerable groups.

Palabras clave:
COVID-19
Pandemia
Primera ola
Trastorno por estrés postraumático
TEPT
Profesionales sanitarios
Supervivientes de la infección
TOP-8

Trastorno por estrés postraumático tras la primera ola de la pandemia en pacientes hospitalizados por COVID-19 y profesionales sanitarios de primera línea en un hospital terciario español: un estudio observacional retrospectivo

R E S U M E N

La pandemia por COVID-19 ha tenido grave impacto sobre la salud mental, asociándose con Trastorno por estrés postraumático (TEPT) tras la infección y en profesionales sanitarios. Nos proponemos comparar la

* Corresponding author.
E-mail address: carolinaelisa.combarro@salud.madrid.org (C. E. Combarro Ripoll); juande.molina@salud.madrid.org (J. D. Molina).

https://doi.org/10.5093/anyes2023a17

semiología, evolución y variables asociadas al trauma entre ambos grupos en una muestra de pacientes. Se realizó un estudio observacional retrospectivo, incluyendo 42 pacientes hospitalizados por COVID-19 y 31 profesionales sanitarios, tratados en el Servicio de Psiquiatría del Hospital 12 de Octubre, entre junio 2020/21, con diagnóstico de TEPT. Se realizó entrevista clínica estándar. Adicionalmente, se pasó la Escala de 8 ítems para los resultados del tratamiento del TEPT (TOP-8). Se recogieron datos demográficos, variables relacionadas con la estancia hospitalaria y variables pre/peri/post-trauma. Se analizaron los datos usando el programa Stata 16. Los profesionales sanitarios mostraron mayores niveles de recuperación, sin embargo, no hubo diferencias significativas en la severidad inicial del TEPT. El patrón sintomático fue similar entre ambos grupos, excepto que los profesionales presentaron más disociación durante el evento traumático. Todos presentaron principalmente síntomas intrusivos, hiperactivación y dificultades de sueño. Haber presenciado sufrimiento o muerte, y la etnia gitana, fueron las variables con mayor impacto en la severidad del TEPT. Estos resultados sugieren que la COVID-19 deja importantes secuelas psicológicas como el TEPT, tanto en supervivientes de la infección como en profesionales sanitarios. Las diferencias encontradas podrían ser debidas a disimilitudes en recursos de afrontamiento y estilos de adherencia terapéutica. Consideramos que conocer las variables involucradas puede ayudar a mejorar la intervención en estos grupos vulnerables.

Introduction

The World Health Organization officially declared the COVID-19 pandemic on March 11, 2020 (WHO, 2020), till the present with more than 700 million people infected and more than 7 million deaths worldwide (WHO COVID-19 Dashboard, online). Until 5 May 2023 it was considered as a global public health emergency (WHO, 2023), with an increasingly evident impact on mental health. High prevalences of psychosocial morbidities have been estimated in response to the pandemic, such as symptoms of anxiety, depression and post-traumatic stress (Salanti et al., 2022; Oyat et al., 2022; Campos et al., 2022). COVID-19 has been defined as a highly stressful event, capable of provoking post-traumatic stress reactions (Bridgland et al., 2021), which generate clinically significant discomfort or deterioration in social, work or other important areas of functioning.

Decades of research suggest serious implications for mental health derived from major disasters or catastrophes, with a high incidence of Post Traumatic Stress Disorder (PTSD) (Rogers et al., 2020; Galea et al., 2007; Li et al., 2019), as well as in the context of epidemics of past infectious diseases such as SARS, MERS, Ebola, influenza and HIV (Xiao et al., 2020). A study in SARS survivors has already pointed to the possibility that there are persistent psychological disorders over time after having recovered from the infectious disease (Lee et al., 2007).

In a cross-sectional study conducted in March 2020 on a sample of the general population in Spain, which included 3,480 participants over the age of 18 surveyed online, it was found that 15.8% indicated moderate-severe symptoms of PTSD (González-Sanguino et al., 2020). In other studies published later in the general adult population of different countries, higher prevalence rates of this disorder are collected (Krishnamoorthy et al., 2020; Liu et al., 2020; Cooke et al., 2020), which suggests that with the continuity over time of the pandemic, and the increasing numbers of victims, these rates have continued to rise. More specifically, among adult survivors of acute COVID-19 infection, a study published in February 2021 estimates a PTSD prevalence of 30.2% (Janiri et al., 2021).

Given the high prevalence of PTSD symptoms reactive to the context of the pandemic, we consider relevant to evaluate the sociodemographic and clinical outcomes associated with this disorder, both in patients who were hospitalized for the infection and in health professionals, since particularly most of the epidemiological studies related to COVID-19 detect a higher prevalence of PTSD among these groups; first in those who have passed the infection, followed by the families of the infected people, health professionals, and, lastly, the general population (Xiao et al., 2020).

The main symptoms of PTSD, as defined by the DSM-5 and that we evaluated in the present study, include recurrent intrusive phenomena, persistent avoidance of stimuli, negative cognitive and mood disturbances, and significant alterations in the level of alertness and reactivity, all in relation to the traumatic event (American Psychiatric Association, 2013).

Most of the literature does not discriminate between the presence of post-traumatic symptoms and the existence of a clinically relevant picture of PTSD, or makes a description of cases that refer to post-traumatic symptoms. In previous articles (Molina et al., 2022) an analysis of the symptoms presented by our patients has been carried out, however, the objective of this work is aimed at analyzing the symptom pattern of those patients who meet criteria for disorder (such as is defined in DSM-5).

This article aims to assess the incidence of post-traumatic symptoms and post-traumatic stress disorder in patients hospitalized for COVID-19 and healthcare workers who have asked for mental health attendance due to their work activity during the first wave of the pandemic, as well as analyze the symptomatic pattern presented and assess whether there are significant differences between the clinical picture of PTSD presented by patients who experienced the traumatic situation as patients and those who experienced it as professionals.

Finally, it is proposed to assess whether there are statistically significant differences in the severity and evolution of the PTSD depending on the pre-, peri-, and post-trauma variables established by the literature as the most relevant, as a way of helping to identify symptomatic patterns of risk or worse prognosis that facilitate earlier intervention in these patients.

Method

Design

This observational, longitudinal/retrospective study first includes patients treated at the Mental Health Service of University Hospital 12 de Octubre (Madrid, Spain), between June 2020 and June 2021, with a diagnosis of PTSD.

Participants

Participants accessed through two different routes: (1) through a telephone survey carried out on all patients admitted for COVID-19 in the hospital during the first wave of the pandemic, from February to May 2020, arising from a previously published double-phase

study (Molina JD et al., 2022); and (2), health professionals who worked in the hospital and asked for psychological treatment.

In this study, we included those patients who received a probable or confirmed diagnosis of COVID-19 (by PCR or suggestive symptoms), as well as the health professionals mentioned, all of them reporting symptoms compatible with PTSD according to DSM-5 criteria.

Of the 2486 patients admitted for COVID-19, 1695 (68.18%) were contacted for the screening evaluation after hospital discharge and agreed to participate in the study. Of these, 268 reported post-traumatic symptoms (15.81%, specifically, they answered affirmatively to the question: *Since you became ill, have you relieved, dreamed or harrowingly remembered what happened to you?*). Of the 133 patients who were scheduled for further evaluation due to significant clinical symptoms, we confirmed PTSD diagnosis in 42 of them (31.58%).

On the other hand, 150 health professionals were attended, 31 of which met criteria for PTSD diagnosis (20.67%). Of these in whom the disorder was detected, 11 had also been admitted for COVID-19 infection, having suffered the trauma both as professionals and as patients.

Therefore, our total sample includes 73 patients, 42 of them who had been hospitalized, and 31 health professionals, with and without hospitalization added. 21 (28,77%) were male and 52 (71.23%) were female. Mean age was 50. More sociodemographic data are shown in Table 1.

Table 1. Demographic data of the total sample

	Total (N=73)
Sex	
Male	21 (28.77%)
Female	52 (71.23%)
Age	50.92 (8.65)
Education level	
Primary	24 (32.88%)
Secondary	20 (27.40%)
Higher	29 (39.73%)
Socioeconomic level	
Low	31 (42.47%)
Middle	41 (56.16%)
High	1 (1.37%)
Ethnicity	
Immigrants	
Latin American	27 (36.99%)
Eastern Europe	1 (1.37%)
Nonimmigrants	
Caucasian	39 (53.42%)
Gypsy	6 (8.22%)
Civil status	
Married	49 (67.12%)
Separated/Divorced	12 (16.44%)
Single	10 (13.70%)
Widower	2 (2.74%)

Procedure

We developed an assessment and follow-up program that assessed and offered treatment for emotional sequelae after discharge. We carried out telephone interviews offering an assessment of their psychopathological state, based on a semi-structured survey adapted from the Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998). In case significant distress was detected in this screening (initiated or worsened after admission), a consultation was offered to assess individual treatment.

In the case of health workers from the hospital, they were offered evaluation and treatment in case of perceiving significant emotional affectation.

Evaluation (Instruments)

They were administered the Spanish adaptation of the 8-item treatment-outcome post-traumatic stress disorder scale (TOP-8) (Davidson & Colket, 1997; Bobes et al., 2000), which quantifies the frequency and severity of each of the PTSD symptoms, through a questionnaire of 8 questions, which are scored from 0 (no problem) to 4 (very serious). Spanish version of the TOP-8 have shown adequate reliability and validity for assessing PTSD patients in daily clinical practice (Bobes et al, 2000).

In addition, the following data on affiliation and variables associated with hospital stay were collected from the electronic medical record, as well as the following variables associated with PTSD considered of interest in the reference literature:

- Pre-trauma factors: Sex; Age; Education level; Socioeconomic level; Ethnicity/Immigration; Civil status; Family support; Health professional; Previous adult traumatic history; Childhood/adolescent trauma; Previous psychopathology; Substance abuse; Family psychiatric history; Previous chronic physical disease.
- Factors associated with the traumatic situation: COVID-19 severity; ICU (number of days); Days in emergencies; Days of hospitalization; Negative experience of hospitalization; Confusional syndrome; Witness of death/suffering of other people; Dissociative reactions.
- Post-trauma factors: Other concomitant psychosocial stressors; Physical sequelaes; Pain; Grief; Relational difficulties.
- Resilience factors: Social support; Psychiatric/psychological care during hospitalization; Previous personality; Trauma processing; Hopelessness.
- Post-traumatic symptoms: Intrusive symptoms; Hyperarousal; Irritability; Avoidance behavior; Negative alterations; Interpersonal anesthesia; Cognitive alterations; Dissociative symptoms; Extreme fear; Sleep disorders/nightmares; TOP-8; Other anxiety/affective disorder.

Statistical analysis

Quantitative variables with normal distribution were summarized using mean and standard deviation, and quantitative variables that did not follow a normal distribution were expressed using the median (p50) and the interquartile range (p25-p75). To check the distribution of normality, the Shapiro-Wilk test was used. Qualitative variables were described in absolute numbers (number of cases) and relative frequencies (percentage).

The comparison between the groups was made using the Student's T test, ANOVA, Kruskal-Wallis or the Mann-Whitney U test, according to the normal distribution, for the quantitative variables. For qualitative variables, the chi-square ($\chi 2$) test or Fisher's exact test were used. The evaluation of the pre/post change of TOP-8 was performed with a Student's T for independent populations, whose change is represented with the mean and a 95% confidence interval.

All analyzes have been performed using the Stata version 16 statistical program. The level of significance used is equal to 0.05 (bilateral alpha error of 5%) for all contrasts.

Table 2. Differences in symptom pattern in hospitalized patients and health professionals

	Total N = 73	Patients N = 42 (57.53%)	Health professionals N = 31 (42.47%)	*p*-value
Intrusive post-trauma symptoms	71 (98.61%)	41 (100.00%)	30 (96.77%)	0.25
Post-trauma hyperarousal	60 (82.19%)	32 (76.19%)	28 (90.32%)	0.12
Post-trauma irritability	57 (78.08%)	33 (78.57%)	24 (77.42%)	0.91
Post-trauma avoidance behavior	59 (80.82%)	33 (78.57%)	26 (83.87%)	0.57
Negative post-trauma alterations	40 (54.79%)	24 (57.14%)	16 (51.61%)	0.64
Post-trauma interpersonal anesthesia	20 (27.40%)	14 (33.33%)	6 (19.35%)	0.19
Post-trauma cognitive alterations	58 (81.69%)	36 (87.80%)	22 (73.33%)	0.12
Post-traumatic dissociative symptoms	8 (11.59%)	5 (13.16%)	3 (9.68%)	0.65
Post-trauma extreme fear	46 (63.01%)	28 (66.67%)	18 (58.06%)	0.45
Post-trauma sleep disorders/nightmares	64 (87.67%)	38 (90.48%)	26 (83.87%)	0.40
Dissociative reactions during trauma	22 (33.33%)	8 (19.51%)	14 (56.00%)	*0.002
PTSD severity (TOP-8 pre-treatment)	17.30 (5.96)	17.00 (11.00-22.00)	17.00 (14.00-23.00)	0.36
Difference TOP-8 post	-10.69 (6.49)	-9.05 (7.04)	-12.96 (4.90)	*0.014

*significant p-value.

Results

Symptom pattern of the sample (See Table 2)

In general, the subjects presented mainly intrusive symptoms, hyperarousal and sleep-related difficulties. Post-traumatic dissociative symptoms and interpersonal anesthesia were less frequent.

There are no statistically significant differences between patients hospitalized for COVID-19 and health professionals in the severity of the clinical picture of PTSD presented (p 0.36), although differences are observed in relation to recovery, with a significantly higher improvement in the health professionals after the treatment (p 0.014).

Regarding the symptomatic pattern, no differences were observed in the clinical picture or the type of symptoms presented, with one exception: the professionals presented more dissociative reactions during the traumatic event (p 0.002).

It should be noted that it was found that 100% of the health professionals declared having witnessed the horror (suffering/death of other people), while only 87.50% of the patients defined themselves as witnesses to it (p 0.041), this being one of the variables with the greatest weight in the PTSD severity.

Differences in PTSD severity (TOP-8) in function on designated variables (See Table 3)

No significant differences were observed in the severity of post-traumatic symptoms based on age, sex, or educational or socioeconomic level, or between the migrant or local population.

Significant differences are observed in the TOP-8 values between the different ethnic groups, with the gypsy being the one with the highest values (p 0.004).

Regarding the variables related to hospitalization, statistically significant differences were found in the severity of the post-traumatic condition between those patients who witnessed the horror and those who did not witness scenes of life-threatening exposure (p 0.02), not appreciating differences in function of the rest of the variables.

The variables of our sample associated with PTSD that are considered of interest are shown in Tables 4 and 5.

Differences in prognosis/recovery

In general, the severity of the clinical picture of PTSD was reduced after the intervention.

Significant differences were found in the pre/post change of the TOP-8 scale among health professionals, with a mean reduction of 9.05 (1.13) for group of non-health workers and of 12.96 (0.92) for health professionals, with a mean difference of 3.91 (95% CI: 0.83 - 6.99), being higher in the latter group.

Table 3. TOP-8 values pre-treatment in function on designated variables

	TOP-8 pre-treatment	Significance
Sex		
Male	17.00 (11.00-22.00)	0.74
Female	17 (14.00-22.00)	
Education level		
Primary	19 (13.00-23.50)	
Secondary	14.50 (11.00-20.00)	0.20
Higher	17.00 (15.00-22.00)	
Socioeconomic level		
Low	18.00 (12-00-23.00)	
Middle	17.00 (13.00-22.00)	0.88
High	17.00 (17.00-17.00)	
Ethnicity		
Immigrants		
Latin American	17 (12.00-22.00)	
Eastern Europe	14 (14.00-14.00)	*0.004
Nonimmigrants		
Caucasian	17 (13.00-21.00)	
Gypsy	26 (23.00-29.00)	
Civil status		
Married	17.00 (13.00-22.00)	
Separated/ Divorced	16.00 (12.50-23.00)	0.84
Single	19.50 (17.00-22.00)	
Widower	16.50 (10.00-23.00)	
Family support		
No	17.00 (14.00-21.50)	0.86
Yes	17.00 (13.00-23.00)	
Health professional		
No	17.00 (11.00-22.00)	0.36
Yes	17.00 (14.00-23.00)	
Previous adult traumatic history		
No	17.00 (14.00-22.00)	0.38
Yes	16.50 (10.00-22.00)	
Childhood/adolescent trauma		
No	17.00 (13.00-21.00)	0.15
Yes	21.50 (15.00-23.50)	

Table 3. TOP-8 values pre-treatment in function on designated variables (continued)

	TOP-8 pre-treatment	Significance
Previous psychopathology		
No	16.83 (16.13)	0.45
Yes	17.91 (5.77)	
Substance abuse		
No	17.00 (13.00-22.00)	0.22
Yes	22.00 (18.50-23.00)	
Family psychiatric history		
No	16.50 (13.00-22.00)	0.34
Yes	19.00 (14.00-22.00)	
Previous chronic physical disease		
No	17.00 (14.00-23.00)	0.61
Yes	17.00 (13.00-18.00)	
COVID-19 severity		
Asymptomatic	17.00 (16.00-18.00)	0.92
Mild	17.00 (10.00-23.00)	
Moderate	17.50 (14.00-22.00)	
Severe	16.50 (14.00-24.00)	
Not COVID-19	16.00 (14.00-19.00)	
ICU		
No	17.00 (13.00-22.00)	0.96
Yes	16.00 (14.00-22.00)	
Negative experience of hospitalization		
No	13.50 (10.00-17.00)	0.39
Yes	17.00 (13.00-23.00)	
Confusional syndrome		
No	18.00 (13.50-23.50)	0.27
Yes	15.50 (12.50-19.50)	
Witness of death/suffering of other people		
No	12.00 (10.00-15.00)	*0.022
Yes	17.00 (14.00-23.00)	

*significant p-value.

A worse recovery is observed in patients with alcohol consumption (p 0.054), and a greater change in those patients who witnessed the horror during admission (p 0.03), and in patients who have symptoms of extreme fear (p 0.082) or hyperarousal (p 0.003), showing statistically significant differences.

In general, health professionals showed higher levels of recovery than the other group of covid-19 patients (p 0.014).

No significant differences appear in terms of the recovery observed based on the rest of the sociodemographic variables, relative to hospitalization or to the covid-19 clinic presented.

Discussion

This paper, in addition to add evidence of the high PTSD incidence in COVID-19 hospitalized patients and in healthcare workers, portrays the differences in severity and illness course between these two samples after receiving the same treatment.

The patients in our sample have experienced exceptionally stressful circumstances in the first person in the context of the first pandemic wave, in addition to having been exposed in the same way as the general population to the multiple psychosocial stress factors linked to the pandemic. 31% of patients in our sample met DSM-5 criteria for the diagnosis of PTSD. This data is higher than in previous studies with a similar follow-up, where prevalences of around 11-23% (Huang et al., 2022) are shown; and it is close to the prevalences observed at one month of follow-up in other studies (Ju et al., 2021). In longer-term studies, prevalences of 23% have been found one year after discharge from the ICU.

Health workers are a group that is especially vulnerable to chronic psychological stress, trauma and the development of PTSD (Grassi & Magnani, 2000). In addition, taking into account data from previous pandemics such as SARS or MERS, we have evidence of a prevalence of even more than 50% of these symptoms after them, associated with a prolonged deterioration in their quality of life and their performance at work (Maunder et al., 2006; Maunder et al., 2008). The characteristics of the COVID-19 pandemic, especially the first wave, add numerous risk factors for the development of PTSD, such as sudden increases in cases, lack of material or human resources, and lack of clear public health protocols or policies (Braquehais et al., 2020). In our sample, 20% of health workers met diagnostic criteria for PTSD. It is worth noting that figures are similar to other screening studies carried out in neighboring countries such as France (Fournier et al., 2022).

According to our analyses, the severity of PTSD is similar both in patients who were hospitalized and in health professionals, with no significant differences even though the risk factors are very different. However, it should be noted that health professionals show greater improvement after a similar approach and treatment. Possible explanations for this finding could be related to sociodemographic factors, better coping resources or better treatment adherence in healthcare workers, although this was not assessed.

The only sociodemographic variable that correlates with greater severity of the post-traumatic stress is the gypsy ethnic group. The literature on psychopathology in the gypsy ethnic group is limited in general, so more research should be done on cross-cultural factors that could explain this difference. This contrasts with other studies that show that older age, female sex, people with dependent children, low educational level, previous psychopathology, less emotional support, or the presence of somatic symptoms after hospital discharge (Ju et al., 2021; Wang et al., 2021), are related to greater severity of PTSD. The history of childhood trauma or previous traumatic history in adulthood did not significantly influence the severity of PTSD in our sample, contrary to what was expected.

Table 4. Trauma-associated characteristics

	Total (N=73)
Pre-trauma family support	61 (83.56%)
Previous adult traumatic history	24 (32.88%)
Childhood/adolescent trauma	16 (21.92%)
Previous psychopathology	32 (43.84%)
Substance abuse	4 (5.48%)
Family psychiatric history	18 (25.00%)
Post-trauma comorbid anxiety/affective disorder	35 (47.95%)
Post-trauma physical sequelae	52 (71.23%)
Post-trauma pain	33 (45.21%)
Post-trauma grief	14 (19.18%)

Regarding the symptom pattern of PTSD, it is also similar between patients and health professionals, except that professionals presented more dissociative reactions during the traumatic event. Although we have not found previous literature that delves into these differences, we think it to be likely that health professionals, especially during the first wave of the pandemic, presented adaptive dissociative reactions, not necessarily pathological, that helped them continue with their daily work, and that protected them psychologically at first, however with the possibility of developing PTSD after a period of latency. In fact, 100% of health professionals declare to have been a direct witness of death or extreme suffering of other people, compared to 87% of admitted patients.

Table 5. Variables applicable to patients with COVID-19 hospitalization

	Non-health professionals (N = 42)	Health professionals (N = 11)
Previous chronic physical disease	11 (26.19%)	0 (0.00%)
COVID-19 severity		
Not COVID-19	0 (0.00%)	0 (0.00%)
Asymptomatic	0 (0.00%)	0 (0.00%)
Mild	15 (35.71%)	2 (18.18%)
Moderate	21 (50.00%)	6 (54.54%)
Severe	6 (14.29%)	3 (27.27%)
ICU	6 (14.29%)	3 (27.27%)
Days in ICU	20.5	17.7
Hours in emergencies	30.35	30.37
Negative experience of hospitalization	40 (95.24%)	9 (81.82%)
Days of hospitalization	9.59	18
Confusional syndrome during hospitalization	10 (23.81%)	2 (18.18%)
Post-trauma physical sequelae	35 (83.33%)	8 (72.73%)
Post-trauma pain	26 (61.90%)	5 (45.45%)
Psychiatric/psychological care during hospitalization	2 (4.76%)	0 (0.00%)
Hopelessness at the start of therapy	12 (28.57%)	2 (18.18%)

In general, the subjects presented mainly intrusive and hyperarousal symptoms, and sleep-related issues. This pattern coincides with a previous Italian study (Craparo et al., 2022) in which it is evidenced that hospitalized patients have a higher prevalence of intrusive, re-experiencing and hyperarousal symptoms; and with a French study in health professionals, where intrusive symptoms also predominate (Fournier et al., 2022). On the other hand, insomnia, in addition to being a symptom within the PTSD criteria, is the most frequent psychological sequelae after COVID-19 infection (Badenoch et al., 2022).

Among the factors related to admission, greater severity of PTSD stands out in those patients who witnessed extreme suffering or death of other people, compared to those who were not exposed to these situations. Other factors such as the severity of the infection, admission to the ICU, the length of stay or having suffered an acute confusional syndrome did not imply greater severity in our sample. This is striking considering that ICU stay is an important risk factor for the development of PTSD, and there is increasing evidence of high prevalences of this disorder in survivors of critical illness (Parker et al., 2015).

After the therapeutic intervention, in general, the patients experienced an improvement in the symptoms of PTSD, especially in extreme fear and hyperarousal, evidencing once again the benefit of the evaluation and treatment of this pathology. We observed differences in patients with active alcohol consumption, who presented less response and more discreet improvements; compared to a greater improvement in patients who witnessed situations of suffering or death of others. Problematic alcohol consumption generally hinders the recovery and treatment of comorbid psychiatric pathologies and especially PTSD, in which the use of alcohol as self-medication is frequent (Taylor et al., 2017).

The rest of the variables evaluated (sociodemographic, related to admission or infection) have not influenced recovery in the case of our sample. To our knowledge, there are no previous works that have evaluated the evolution of PTSD after a therapeutic intervention in COVID-19 patients or health professionals.

The main strength of our study is that it is one of the first to evaluate the impact of treatment on PTSD related to the COVID-19 pandemic in patients who have been hospitalized for the infection and in health professionals. In addition, it clearly distinguishes the structured picture of PTSD from the presence of post-traumatic symptoms that do not meet criteria for the complete disorder, which until now is about what there is more literature. In our opinion, this may have relevant implications for the intervention and evolution of the patients. Mainly, it endorses the importance of reinforcing the care available to healthcare professionals, allocating more resources to mental health; and this is considered especially relevant today, given the increase in care demand from the Spanish health system.

On the other hand, we are aware of the limitations of the study. The sample size is small, and this may have reduced the power of detecting significant differences. Given that the priority of the project has been clinical assistance, no specific PTSD treatment protocol was developed for scientific research, and the patients were treated according to the criteria of the professionals involved. For the study, no comparison groups have been established based on the type of treatment received since it was far from the main objectives of the study. It would be of great interest for future research to compare, for example, the results of a psychotherapeutic treatment vs. psychotherapeutic + pharmacological. The factors evaluated are based on the existing literature on PTSD and the circumstances that have been seen to influence the development of psychopathology during this pandemic. The scale used may also have limitations in terms of detecting milder symptoms, evaluation of atypical symptoms or comorbidities.

Conclusions

The COVID-19 pandemic has left many sequels and consequences in the general population and vulnerable groups, such as those of people who have been infected and health professionals. Psychological sequelae, including PTSD, are very frequent and disabling among infection survivors and health workers, and have led to a significant increase in these groups of the demand for care in the Mental Health services. The care and treatment of this pathology is essential for the functional recovery of patients and to guarantee the well-being of our health professionals. The symptoms and severity are similar in both groups, although there may be differences in specific ethnic groups such as the gypsy population, and greater severity if they have witnessed the extreme suffering of other people. Adequate treatment according to clinical guidelines improves the symptoms of PTSD, although it is necessary to continue investigating how to improve the approach in specific cases such as dual pathology or ethnic minorities. Further research is also needed to clarify the risk factors for its development, both in patients and in

health professionals, and to test preventive interventions in the case of a new public health emergency of international concern (PHEIC) emerges.

Acknowledgements

This work has been supported by the Mental Health Service of University Hospital 12 de Octubre (Madrid, Spain), with the advice of the Research and Science Support Unit (I + 12) of the same hospital.

Financial support

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

Conflicts of Interest

The authors have no conflicts of interest to report.

Ethical standards

Ethical approval was not provided for this study on human participants because the Ethics Committee of the center in which the study was performed considered there was no need for an evaluation since: (1) it was a retrospective study in which medical records were only reviewed; (2) standard therapeutic interventions have been performed in this group of patients, in no case experimental; and (3) the database was anonymized to preserve sensitive data from patients. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

References

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders (5th Ed.).* Washington, DC: APA.

Badenoch, J. B., Rengasamy, E. R., Watson, C., Jansen, K., Chakraborty, S., Sundaram, R. D., ... & Rooney, A. G. (2022). Persistent neuropsychiatric symptoms after COVID-19: a systematic review and meta-analysis. *Brain communications, 4*(1), fcab297. https://doi.org/10.1093/braincomms/fcab297

Bobes, J., Calcedo-Barba, A., García, M., Francois, M., Rico-Villademoros, F., González, M. P., & Bousoño, M. (2000). Evaluación de las propiedades psicométricas de la versión española de cinco cuestionarios para la evaluación del trastorno de estrés postraumático [Evaluation of the psychometric properties of the Spanish version of five questionnaires for the assessment of post-traumatic stress disorders]. *Actas Españolas de Psiquiatría, 28*(4), 207–218.

Braquehais, M. D., Vargas-Cáceres, S., Gómez-Durán, E., Nieva, G., Valero, S., Casas, M., & Bruguera, E. (2020). The impact of the COVID-19 pandemic on the mental health of healthcare professionals. *QJM: An International Journal of Medicine, 113*(9), 613–617. https://doi.org/10.1093/qjmed/hcaa207

Bridgland, V., Moeck, E. K., Green, D. M., Swain, T. L., Nayda, D. M., Matson, L. A., … & Takarangi, M. (2021). Why the COVID-19 pandemic is a traumatic stressor. *PloS one, 16*(1), e0240146. https://doi.org/10.1371/journal.pone.0240146

Campos, J. A. D. B., Campos, L. A., Martins, B. G., Valadão Dias, F., Ruano, R., & Maroco, J. (2022). The Psychological Impact of COVID-19 on Individuals With and Without Mental Health Disorders. *Psychological reports, 125*(5), 2435–2455. https://doi.org/10.1177/00332941211026850

Cooke, J. E., Eirich, R., Racine, N., & Madigan, S. (2020). Prevalence of posttraumatic and general psychological stress during COVID-19: A rapid review and meta-analysis. *Psychiatry Research, 292*, 113347. https://doi.org/10.1016/j.psychres.2020.113347

Craparo, G., La Rosa, V. L., Marino, G., Vezzoli, M., Cinà, G. S., Colombi, M., … & Mangiapane, E. (2022). Risk of post-traumatic stress symptoms in hospitalized and non-hospitalized COVID-19 recovered patients. A cross-sectional study. *Psychiatry research, 308,* 114353. https://doi.org/10.1016/j.psychres.2021.114353

Davidson, J.R., & Colket, J.T. (1997). The eight-item treatment-outcome post-traumatic stress disorder scale: a brief measure to assess treatment outcome in post-traumatic stress disorder. *International Clinical Psychopharmacology, 12*, 41–46. https://10.1097/00004850-199701000-00006

Fournier, A., Laurent, A., Lheureux, F., Ribeiro-Marthoud, M. A., Ecarnot, F., Binquet, C., & Quenot, J. P. (2022). Impact of the COVID-19 pandemic on the mental health of professionals in 77 hospitals in France. *PloS one, 17*(2), e0263666. https://doi.org/10.1371/journal.pone.0263666

Galea, S., Brewin, C. R., Gruber, M., Jones, R. T., King, D. W., King, L. A., … & Kessler, R. C. (2007). Exposure to hurricane-related stressors and mental illness after Hurricane Katrina. *Archives of general psychiatry, 64*(12), 1427–1434. https://doi.org/10.1001/archpsyc.64.12.1427

González-Sanguino, C., Ausín, B., Castellanos, M. Á., Saiz, J., López-Gómez, A., Ugidos, C., & Muñoz, M. (2020). Mental health consequences during the initial stage of the 2020 Coronavirus pandemic (COVID-19) in Spain. Brain, behavior, and immunity, 87, 172–176. https://doi.org/10.1016/j.bbi.2020.05.040

Grassi, L., & Magnani, K. (2000). Psychiatric morbidity and burnout in the medical profession: an Italian study of general practitioners and hospital physicians. *Psychotherapy and psychosomatics, 69*(6), 329-334. https://doi.org/10.1159/000012416

Huang, L., Xu, X., Zhang, L., Zheng, D., Liu, Y., Feng, B., … & Zhang, Z. (2022). Post-traumatic Stress Disorder Symptoms and Quality of Life of COVID-19 Survivors at 6-Month Follow-Up: A Cross-Sectional Observational Study. *Frontiers in psychiatry, 12,* 782478. https://doi.org/10.3389/fpsyt.2021.782478

Janiri, D., Carfì, A., Kotzalidis, G. D., Bernabei, R., Landi, F., Sani, G., & Gemelli Against COVID-19 Post-Acute Care Study Group. (2021). Posttraumatic stress disorder in patients after severe COVID-19 infection. *JAMA Psychiatry, 78*(5), 567–569. https://doi.org/10.1001/jamapsychiatry.2021.0109

Ju, Y., Liu, J., Ng, R. M., Liu, B., Wang, M., Chen, W., … & Zhang, Y. (2021). Prevalence and predictors of post-traumatic stress disorder in patients with cured coronavirus disease 2019 (COVID-19) one month post-discharge. *European Journal of Psychotraumatology, 12*(1), 1915576. https://doi.org/10.1080/20008198.2021.1915576

Krishnamoorthy, Y., Nagarajan, R., Saya, G. K., & Menon, V. (2020). Prevalence of psychological morbidities among general population, healthcare workers and COVID-19 patients amidst the COVID-19 pandemic: A systematic review and meta- analysis. Psychiatry research, 293, 113382. https://doi.org/10.1016/j.psychres.2020.113382

Lee, A. M., Wong, J. G., McAlonan, G. M., Cheung, V., Cheung, C., Sham, P. C., … & Chua, S. E. (2007). Stress and Psychological Distress among SARS Survivors 1 Year after the Outbreak. *The Canadian Journal of Psychiatry, 52*(4), 233–240. https://doi.org/10.1177/070674370705200405

Li, X., Aida, J., Hikichi, H., Kondo, K., & Kawachi, I. (2019). Association of Postdisaster Depression and Posttraumatic Stress Disorder With Mortality Among Older Disaster Survivors of the 2011 Great East Japan Earthquake and Tsunami. *JAMA network open, 2*(12), e1917550. https://doi.org/10.1001/jamanetworkopen.2019.17550

Liu, C. H., Zhang, E., Wong, G., Hyun, S., & Hahm, H. C. (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for U.S. young adult mental health.Psychiatry research,290, 113172. https://doi.org/10.1016/j.psychres.2020.113172

Maunder, R. G., Lancee, W. J., Balderson, K. E., Bennett, J. P., Borgundvaag, B., Evans, S., … & Wasylenki, D. A. (2006). Long-term Psychological and Occupational Effects of Providing Hospital Healthcare during SARS Outbreak. *Emerging Infectious Diseases, 12*(12), 1924-1932. https://doi.org/10.3201/eid1212.060584

Maunder, R. G., Leszcz, M., Savage, D., Adam, M. A., Peladeau, N., Romano, D., … & Schulman, B. (2008). Applying the lessons of SARS to pandemic influenza: an evidence-based approach to mitigating the stress experienced by healthcare workers. *Canadian journal of public health = Revue canadienne de sante publique, 99*(6), 486–488. https://doi.org/10.1007/BF03403782

Molina, J. D., Rodrigo Holgado, I., Juanes González, A., Combarro Ripoll, C. E., Lora Pablos, D., Rubio, G., … & Rivas-Clemente, F. (2022). Neuropsychological Symptom Identification and Classification in the Hospitalized COVID-19 Patients During the First Wave of the Pandemic in a Front-Line Spanish Tertiary Hospital. *Frontiers in psychiatry, 13*, 838239. https://doi.org/10.3389/fpsyt.2022.838239

Oyat, F. W. D., Oloya, J. N., Atim, P., Ikoona, E. N., Aloyo, J., & Kitara, D. L. (2022). The psychological impact, risk factors and coping strategies to COVID-19 pandemic on healthcare workers in the sub-Saharan Africa: a narrative review of existing literature. BMC psychology, 10(1), 284. https://doi.org/10.1186/s40359-022-00998-z

Parker, A. M., Sricharoenchai, T., Raparla, S., Schneck, K. W., Bienvenu, O. J., & Needham, D. M. (2015). Posttraumatic stress disorder in critical illness survivors: A metaanalysis. *Critical Care Medicine, 43*(5) 1121-1129.https://10.1097/CCM.0000000000000882

Rogers, J. P., Chesney, E., Oliver, D., Pollak, T. A., McGuire, P., Fusar-Poli, … & David, A. S. (2020). Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: A systematic review and meta-analysis with comparison to the COVID-19 pandemic. *The Lancet Psychiatry, 7*(7), 611–627. https://doi.org/10.1016/S2215-0366(20)30203-0

Salanti, G., Peter, N., Tonia, T., Holloway, A., White, I. R., Darwish, L., Low, N., Egger, M., Haas, A. D., Fazel, S., Kessler, R. C., Herrman, H., Kieling, C., De Quervain, D. J. F., Vigod, S. N., Patel, V., Li, T., Cuijpers, P., Cipriani, A., Furukawa, T. A., … MHCOVID Crowd Investigators† (2022). The Impact of the COVID-19 Pandemic and Associated Control Measures on the Mental Health of the General Population : A Systematic Review and Dose-Response Meta-analysis. Annals of internal medicine, 175(11), 1560–1571. https://doi.org/10.7326/M22-1507

Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., … & Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of Clinical Psychiatry, 59*(Suppl 20), 22–33

Taylor, M., Petrakis, I., & Ralevski, E. (2017). Treatment of alcohol use disorder and co-occurring PTSD. *The American Journal of Drug and Alcohol Abuse, 43*(4), 391-401. https://doi.org/10.1080/00952990.2016.1263641

Wang, B., Yang, X., Fu, L., Hu, Y., Luo, D., Xiao, X., … & Zou, H. (2021). Post-traumatic Stress Disorder Symptoms in COVID-19 Survivors 6 Months After Hospital Discharge: An Application of the Conservation of Resource Theory. *Frontiers in Psychiatry, 12*. https://doi.org/10.3389/fpsyt.2021.773106

WHO Coronavirus (COVID-19) Dashboard [online]: https://covid19.who.int/

WHO Coronavirus (COVID-19) Overview: https://www.who.int/europe/emergencies/situations/covid-19

World Health Organization, 2020. WHO Director-General's Opening Remarks At The Media Briefing On COVID-19 - 11 March 2020 [online]: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

Xiao, S., Luo, D., & Xiao, Y. (2020). Survivors of COVID-19 are at high risk of posttraumatic stress disorder. *Global health research and policy, 5*, 29. https://doi.org/10.1186/s41256-020-00155-2