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Recovering from COVID-19: psychological sequelae and post-traumatic growth six months after discharge

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ABSTRACT

Background: Clinical and scientific evidence has shown that a range of long-lasting symptoms can persist in the post-virological period. However, little is known about the psychological sequelae of patients hospitalized for coronavirus disease 2019 (COVID-19).

Objective: This study aims to assess the prevalence of anxiety–depressive symptoms, post-traumatic stress disorder (PTSD), and post-traumatic growth among patients hospitalized for COVID-19 during the first wave of the pandemic 6 months after discharge, and to identify sociodemographic and clinical factors associated with psychological outcomes.

Method: This cross-sectional cohort study enrolled recovered COVID-19 patients during a multidisciplinary follow-up screening. At 6 months post-discharge, participants underwent a remote assessment with the Mini-International Neuropsychiatric Interview Plus and completed the Hospital Anxiety and Depression Scale, PTSD Checklist for DSM-5, and Post-Traumatic Growth Inventory. Descriptive and regression analyses were conducted.

Results: The sample was composed of 100 patients, mainly males (72%), with a mean ± *SD* age of 58.7 ± 11.8 years. Regarding psychological symptoms, 34% and 24% of patients, respectively, reported anxiety and depression over the clinical threshold, and 20% met the criteria for a possible PTSD diagnosis. Psychological symptoms were associated with the presence of a mood disorder in the patient's clinical history and having received a psychological consultation after discharge. Post-traumatic growth was associated with younger age and having received a psychological consultation after discharge.

Conclusions: A high prevalence of anxiety and depressive symptoms, potentially indicative for a mood or anxiety disorder, and PTSD was confirmed among COVID-19 survivors after 6 months. Anxiety and depressive symptoms and PTSD were associated with a previous diagnosis of a mood disorder and having received psychological consultation. Post-traumatic growth was associated with younger age and having received psychological consultation. Tailored psychological interventions could help to elaborate the psychological suffering and foster post-traumatic growth after a traumatic experience such as COVID-19 hospitalization.

Síndrome post-COVID: secuelas psicológicas y crecimiento postraumático a los 6 meses del alta

Antecedentes: La evidencia clínica y científica reciente ha demostrado que una variedad de síntomas duraderos pueden persistir incluso en el periodo post-virológico. Sin embargo, poco se sabe sobre las secuelas psicológicas de los pacientes hospitalizados por COVID-19.

Objetivo: Este estudio tiene como objetivo evaluar la prevalencia de síntomas ansioso-depresivos, Trastorno de Estrés Postraumático (TEPT) y crecimiento postraumático entre pacientes hospitalizados por COVID-19 durante la primera ola de pandemia seis meses después del alta e identificar los factores socio-demográficos y clínicos asociados con los resultados psicológicos.

Método: Este estudio de cohorte transversal inscribió a pacientes recuperados de COVID-19 durante un tamizaje de seguimiento multidisciplinario. A los seis meses del alta, los participantes se sometieron a una evaluación remota con la Entrevista Neuropsiquiátrica Internacional Mini Plus y completaron la Escala de Depresión y Ansiedad Hospitalaria, la Lista de chequeo-5 para Trastorno de Estrés Postraumático y el Inventario de Crecimiento Postraumático. Se condujeron análisis de regresión y descriptivos.

Resultados: La muestra se compuso de 100 pacientes, principalmente varones (72%), con una edad promedio de 58.7 años (*DE*=11.8). En cuanto a los síntomas psicológicos, 34% y 24% de los pacientes reportaron ansiedad y depresión por encima del umbral clínico y 20% reunía los criterios para un posible diagnóstico de TEPT. Los síntomas psicológicos se asociaron con la

HIGHLIGHTS
- A high prevalence of psychological symptoms has been observed among COVID-19 survivors 6 months after hospitalization.
- Tailored psychological interventions could help to contain the psychological sequelae and facilitate post-traumatic growth.

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presencia de un trastorno del ánimo en la historia clínica del paciente y el haber recibido una consulta psicológica tras el alta. El crecimiento postraumático se asoció con ser más joven y haber recibido una consulta psicológica tras el alta.`

Conclusiones: Se confirmó una alta prevalencia de síntomas ansiosos y depresivos, potencialmente indicativo de un trastorno del estado de ánimo y TEPT entre los sobrevivientes al COVID-19 después de seis meses. Los síntomas ansiosos y depresivos y el TEPT se asociaron con un diagnóstico previo de un trastorno del ánimo y haber recibido consulta psicológica. Se encontró que el crecimiento postraumático se asociaba con ser más joven y haber recibido consulta psicológica. Las intervenciones psicológicas "a la medida" podrían ayudar a elaborar el sufrimiento psicológico y fomentar el crecimiento postraumático tras una experiencia traumática como la hospitalización por COVID-19.

COVID 后综合征：出院后6个月的心理后遗症和创伤后成长

背景：最近的临床和科学证据表明，即使在病毒学后时期，一系列长期症状也会持续存在。然而，对于 COVID-19 住院患者的心理后遗症知之甚少。

目的：本研究旨在评估出院后第一次疫情期间因 COVID-19 住院患者的焦虑抑郁症状、创伤后应激障碍 (PTSD) 和创伤后成长的流行率，并确定与心理结果相关的社会人口统计学和临床因素。

方法：这项横断面队列研究在多学科随访筛查期间招募了康复的 COVID-19 患者。在出院后六个月，参与者接受了迷你国际神经精神病学访谈增订版的远程评估，并完成了医院焦虑和抑郁量表、创伤后应激障碍清单 5 和创伤后成长清单。进行了描述性和回归分析。

结果：样本由100名患者组成，以男性为主（72%），平均年龄58.7岁（*SD*=11.8）。关于心理症状，34% 和 24% 的患者报告焦虑和抑郁超过临床阈值，20% 符合可能的 PTSD 诊断标准。心理症状与患者临床病史中存在情绪障碍有关，并在出院后接受了心理咨询。创伤后成长与年龄较小有关，并且在出院后接受了心理咨询。

结论：在六个月后的 COVID-19 幸存者中，焦虑和抑郁症状的高发率，可能预示着情绪或焦虑障碍，也确认了 PTSD。焦虑和抑郁症状以及 PTSD 与先前诊断为情绪障碍并接受过心理咨询有关。发现创伤后成长与年龄较小和接受过心理咨询有关。量身定制的心理干预有助于在如 COVID-19 住院等创伤经历后阐释心理痛苦并促进创伤后成长。

1. Introduction

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has spread worldwide, becoming a public health emergency of international concern (World Health Organization [WHO], 2020). Since its recognition, coronavirus disease 2019 (COVID-19) has been extensively explored, with specific attention being paid to respiratory manifestations and multiorgan effects (Ayoubkhani et al., 2021). Clinical and scientific evidence has shown that a range of persistent symptoms can remain long after the acute SARS-CoV-2 infection. The term 'post-COVID syndrome' was coined to describe the 'signs and symptoms that develop during or after an infection consistent with COVID-19 which continue for more than 12 weeks and are not explained by an alternative diagnosis' (National Institute for Health and Care Excellence [NICE] guidelines, 2021). COVID-19 survivors report a wide range of long-lasting symptoms resulting in both physical and mental health impairments (Groff et al., 2021). In this scenario, people hospitalized with COVID-19 are a psychologically vulnerable group because of the several stressors that they encountered, such as isolation, uncertainty about treatment and prognosis, fear of death, loss of family members or friends, and lack of support from relatives (Deng et al., 2021; Sun et al., 2020). Similarly to survivors of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) (Ahmed et al., 2020; Hong et al., 2009),

hospitalized COVID-19 patients presented anxiety, depressive symptoms, post-traumatic stress, and sleep disturbances, which extended beyond the viral recovery period (Deng et al., 2021). In a prospective cohort study (Tomasoni et al., 2021), about 30–35% of 261 COVID-19 survivors reported clinically significant anxiety and post-traumatic stress at follow-up 3 months after hospitalization. Available data on the psychological sequelae of hospitalization for COVID-19 remain sparse.

Trauma-related literature suggests that being confronted with highly stressful and potentially traumatic events can produce a positive modification called post-traumatic growth (Calhoun & Tedeschi, 2014). Post-traumatic growth has been defined as the process of finding a sense of personal growth after enduring a psychological struggle (Calhoun & Tedeschi, 2014). The literature showed that COVID-19, like any other traumatic event, may become a growth-enhancing experience (Ikizer, Karanci, Gul, & Dilekler, 2021). Alongside the negative effects on mental health, the general population, healthcare professionals, and people infected by COVID-19 reported positive transformations and changes in life plans (Ikizer et al., 2021; Lamiani et al., 2022; Li et al., 2022). Specifically, survivors of a life-threatening illness may re-evaluate their life priorities, invest more in meaningful relationships, and increase attention to their personal well-being (Zoellner & Maercker, 2006). However, to the best of our knowledge, no previous study has

explored the post-traumatic growth that can occur in patients hospitalized for COVID-19.

The aims of this study were: (1) to assess the prevalence of anxiety–depressive symptoms and post-traumatic stress disorder (PTSD) among COVID-19 patients 6 months after discharge; and (2) to assess whether mental health vulnerabilities are associated with anxiety–depressive symptoms, PTSD, and post-traumatic growth.

2. Materials and methods

2.1. Study design

This cross-sectional study was conducted at the Santi Paolo e Carlo University Hospital in Milan. The study included a psychological and psychiatric assessment of COVID-19 patients 6 months after hospital discharge. This study is part of a larger project named REgistry for COVid19 EmeRgency (RECOVER), which entails a longitudinal follow-up to assess the short-term and long-term persistent sequelae of COVID-19.

2.2. Participants and data collection

Participants were enrolled during a multidisciplinary follow-up screening conducted 1–3 months after discharge from hospitalization for COVID-19 during the first wave of the pandemic (1 March 2020 to 31 May 2020). During the follow-up screening, patients were offered the opportunity to schedule a psychological consultation based on their spontaneous request or clinical assessment. After the follow-up, patients aged over 18 years and able to speak Italian were recruited for the study. Patients who agreed to participate were contacted by telephone 6 ± 1 months after discharge. Data collection was conducted for 4 months from 1 September 2020 to 31 December 2020. All participants were asked to complete an online survey (on SurveyMonkey) composed of a sociodemographic section and self-report questionnaires to measure anxiety, depressive symptoms, PTSD, and post-traumatic growth. The survey took approximately 15 min to complete. An option to complete the questionnaire over the telephone was given for those with limited internet access. Subsequently, participants were asked to complete the Mini-International Neuropsychiatric Interview Plus (MINI Plus) remotely. The MINI Plus interview took about 30 min and was conducted by a resident in psychiatry. Participation in the study was on a voluntary basis.

2.3. Measures

2.3.1. Sociodemographic and clinical data

Sociodemographic and personal variables such as gender, age, and losses due to COVID-19 were collected.

A psychologist, in collaboration with a physician, manually extracted patients' clinical information (days of hospitalization, intensity of care, having received a psychological consultation after discharge) from the hospital's management software (Galileo, Eaton).

2.3.2. Anxiety and depression

The Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) was administered to assess the presence of anxiety and depressive symptoms. HADS is a self-report questionnaire composed of two subscales, assessing anxiety (HADS-A) and depressive symptoms (HADS-D). Each subscale is composed of seven items on a four-point Likert scale. The total score of each subscale ranges from 0 to 21. Lower scores on each scale indicate lower symptoms. In the literature, a score between 8 and 10 indicates the presence of mild symptomatology, and a score above 11 indicates a moderate to severe symptomatology (Bjelland, Dahl, Haug, & Neckelmann, 2002). For descriptive analysis, a score ≥ 11 was considered as an indicator of a clinically significant symptomatology. In the regression analysis, the anxiety and depression scales were utilized as continuous variables. In this study, the subscales presented a good internal consistency, with Cronbach's α = .87 for the HADS-A subscale and Cronbach's α = .80 for the HADS-D subscale.

2.3.3. Post-traumatic stress disorder

The PTSD Checklist for DSM-5 (PCL-5) (Weathers et al., 2013) was administered to assess the presence of a PTSD. The PCL-5 is a self-report questionnaire to screen for PTSD symptoms according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Specifically, the PCL-5 assesses the exposure to actual or threatened death, serious injury, or sexual violence (criterion A); intrusion symptoms; avoidance of stimuli (criterion B); negative alterations in cognitions and mood (criterion C); and marked alterations in arousal and reactivity associated with the traumatic event (criterion D). In this study, we used the PCL-5 standard form without the criterion A component. The PCL-5 is composed of 20 items rating the frequency of the symptoms on a five-point Likert scale ranging from 0 (not at all) to 4 (extremely). The total score ranges from 0 to 80, with higher scores reflecting a higher PTSD symptomatology. For descriptive analysis, a score of ≥ 31 was considered as an indicator of the possible presence of PTSD. In the regression analysis, the scale was utilized as a continuous variable. In this study, the PCL-5 presented an excellent internal consistency, with Cronbach's α = .92.

2.3.4. Post-traumatic growth

The Post-Traumatic Growth Inventory (PTGI) (Tedeschi & Calhoun, 1996) was administered to assess post-traumatic growth. The PTGI is a self-report questionnaire assessing psychological growth in the aftermath of a traumatic event. It considers five subscales: relating to others, new possibilities, personal strength, spiritual change, and appreciation of life. The PTGI is composed of 21 items, each of which rates the change reported after the trauma on a six-point Likert scale ranging from 0 (I have not experienced any change) to 5 (I have experienced a very important change). The total score ranges from 0 to 105, with higher scores reflecting greater growth. Owing to the lack of validated clinical cut-off scores, in the analysis the scale was utilized as a continuous variable. In this study, the PTGI presented an excellent internal consistency, with Cronbach's $\alpha = .95$.

2.3.5. Psychiatric assessment

The Italian version of the MINI Plus was administered to assess the lifetime prevalence of psychiatric disorders in our cohort. The MINI Plus is a structured diagnostic interview developed to identify current and lifetime psychiatric diagnoses according to International Classification of Diseases, 10th revision (ICD-10) criteria. The following diagnostic groupings were considered for our study: stress disorders (including adjustment disorder, post-traumatic stress disorder), anxiety and somatoform disorders (including generalized anxiety disorder, panic disorders, agoraphobia, hypochondria), mood disorders (including major depressive episode, hypomanic episode, premenstrual dysphoric disorder), and other disorders (including personality disorders, eating disorder, substance abuse disorder, alcohol abuse disorder). In addition, MINI Plus identifies the lifetime chronology of psychiatric symptoms (i.e. age of onset, current or past episode, number of episodes) to investigate associated disability and to exclude confounding factors such as organic disturbances, iatrogenic conditions, or alcohol/substance abuse. For each module, 0 indicates the absence of the previous psychiatric condition investigated, whereas 1 indicates the presence of the previous psychiatric condition.

2.4. Statistical analysis

Descriptive data were reported as mean ± SD, median (range), or number of observations (percentage). To identify the sociodemographic and clinical factors associated with psychological outcomes (HADS, PCL-5, and PTGI), multivariate linear regression analyses were conducted with the enter method. Gender, age, having received a psychological consultation after discharge, previous stress-related disorder, previous mood disorder, previous anxiety and somatoform disorders, and previous other disorder were entered as covariates in the regression model. Beta values and related 95% confidence intervals (CIs) were calculated. The significance level was set to $p < .05$ (two-tailed test). All of the statistical analyses were carried out with IBM SPSS Statistics for Windows, version 26.0.

2.5. Ethics

The study was conducted in accordance with principles of the Declaration of Helsinki. The study was approved by the Milan Area 1 Ethical Committee (register #2020/ST/358). All patients provided informed consent prior to participation in the study.

3. Results

3.1. Patients' characteristics

In total, 1225 patients were hospitalized with a COVID-19 diagnosis between 1 March and 31 May 2020 at the Santi Paolo e Carlo University Hospital in Milan. After discharge, 231 patients attended the follow-up screening and 166 agreed to participate in the study (response rate = 71.9%). Of these 166 patients, 66 did not complete all of the testing (19 did not complete the self-report questionnaires and 47 did not complete the MINI Plus) and therefore

Table 1. Patients' sociodemographic and clinical characteristics.

Variable	
Gender	
Male	72 (72)
Female	28 (28)
Age (years)	
Mean ± SD	58.7 ± 11.8
Range	28–83
Intensity of care	
Low-flow oxygen	62 (62)
CPAP	31 (31)
Intensive care	7 (7)
Hospitalization (days)	
Mean ± SD	12.5 ± 8.1
COVID-19-related losses	
No	71 (71)
Yes	29 (29)
Psychological consultation after discharge	
No	81 (81)
Yes	19 (19)
Previous stress-related disorders	
No	95 (95)
Yes	5 (5)
Previous anxiety and somatoform disorders	
No	78 (78)
Yes	22 (22)
Previous mood disorders	
No	85 (85)
Yes	15 (15)
Previous other disorders (personality disorders, etc.)	
No	88 (88)
Yes	12 (12)

Note: Data are shown as n (%) unless otherwise indicated.
CPAP, continuous positive airway pressure; COVID-19, coronavirus disease 2019.

were excluded from the analysis. The study sample was composed of 100 patients, mainly males (72%), with a mean ± SD age of 58.7 ± 11.8 years. Table 1 shows the patients' sociodemographic and clinical characteristics. Patients were hospitalized for a mean number of 12.5 ± 8.1 days and 7% were treated in the intensive care unit. Twenty-nine per cent of patients suffered a loss due to COVID-19. The MINI Plus interview showed that 5% of patients met the criteria for a previous stress-related disorder, 22% for a previous anxiety and somatoform disorder, 15% for a previous mood disorder, and 12% for other psychiatric disorders.

3.2. Psychological outcomes

Means, standard deviations, and ranges for all psychological outcomes are reported in Table 2, along with the percentages of patients with scores above the clinical cut-off for anxiety, depression, and PTSD.

3.3. Association between independent variables and psychological outcomes

The results from multivariate regression analyses are reported in Table 3. In the multivariate models, anxiety symptoms 6 months after discharge were associated with having received a psychological consultation after discharge ($B = 3.17; p < .01$) and having a previous mood disorder ($B = 2.66; p < .05$). Similarly, depressive symptoms were associated with having received a psychological consultation after discharge ($B = 3.03; p < .001$) and having a previous mood disorder ($B = 2.63; p < .01$). PTSD was associated with having received a psychological consultation after discharge ($B = 9.15; p < .01$) and having a previous mood disorder ($B = 7.84, p < .05$). Post-traumatic growth was associated with younger age ($B = -0.45; p < .05$) and having received a psychological consultation after discharge ($B = 13.59; p < .05$).

4. Discussion

This study is one of the first to evaluate the psychological sequelae among hospitalized COVID-19 survivors. The primary aim was to assess the prevalence of anxiety, depressive symptoms and PTSD 6 months

after discharge. In this cohort, the prevalence of psychological distress was significantly high. More than one-third of our sample reported moderate to severe anxiety, approximately one-quarter reported moderate to severe depressive symptoms, and one-fifth presented post-traumatic symptoms. These symptoms could be indicative of a possible diagnosis of mood, anxiety, or post-traumatic disorders, respectively. These findings are in line with those observed 2–3 months after discharge that detected psychological distress in COVID-19 survivors with various degrees of severity and clinical manifestations (Bonazza et al., 2020; Groff et al., 2021; Tomasoni et al., 2021). Of note, previous psychiatric diagnoses including mood and anxiety disorders were substantially lower in our cohort, confirming a role for hospitalization and pandemic stress in increasing anxiety and depressive symptomatology. These data indicate the ongoing indirect effect of COVID-19 on mental health, with symptoms emerging or persisting even 6 months after the acute illness. COVID-19 and hospitalization for this disease may be a traumatic experience for patients since it threatened their lives and exposed them to several stressors, including isolation, uncertain prognosis, and distance from relatives (Sun et al., 2020). These challenging circumstances may lead patients to perceive that they have insufficient resources to cope with the event (Lazarus & Folkman, 1984). Not surprisingly, PTSD symptoms, such as intrusion, avoidance, and hyperarousal, were found among COVID-19 survivors, including those enrolled in this study.

A secondary aim of this study was to identify mental health vulnerabilities associated with psychological symptoms and post-traumatic growth.

Our results showed that the prior diagnosis of mood disorders was associated with anxiety and depressive symptoms and PTSD. This finding is in line with other studies, which showed that individuals with pre-existing psychiatric disorders presented an increased risk of reporting negative physical and psychological effects stemming from the infection (Cullen, Gulati, & Kelly, 2020) and impairment of well-being (Gobbi et al., 2020; Hao et al., 2020). Hao et al. (2020) compared the psychological symptoms and the stress experienced as a result of the COVID-19 pandemic by individuals with and without psychiatric disorders, and found a significantly greater psychological impairment among psychiatric patients. The pandemic has worsened the mental condition of many psychiatric patients, exposing them to multiple stressors, and consequently increased their vulnerability (Gobbi et al., 2020). Thus, it is imperative to consider psychological distress as a clinical concern, especially if it is accompanied by other symptoms satisfying diagnostic criteria for a mood disorder (Drapeau, Marchand, & Beaulieu-Prévost, 2012). For

Table 2. Distributions of the scales for the psychological outcomes.

	N	Min.	Max.	Mean	SD	% Over clinical cut-off
HADS-A	100	0	20	6.47	4.38	34%
HADS-D	100	0	16	4.51	3.59	24%
PCL-5	100	0	51	17.17	13.81	20%
PTGI	100	0	104	37.79	26.29	–

Note: HADS-A, Hospital Anxiety and Depression Scale – Anxiety; HADS-D, Hospital Anxiety and Depression Scale – Depression; PCL-5, PTSD Checklist for DSM-5; PTGI, Post-Traumatic Growth Inventory.

Table 3. Multivariate regression analysis of the variables independently associated with anxiety, depression, post-traumatic stress disorder (PTSD), and post-traumatic growth (PTG).

Variable	Anxiety B (CI)	Depression B (CI)	PTSD B (CI)	PTG B (CI)
Psychological consultations after discharge (yes vs no)	3.17** (1.02 to 5.33)	3.03*** (1.30 to 4.77)	9.15** (2.40 to 15.90)	13.59* (0.16 to 27.02)
Gender	1.58 (−0.29 to 3.45)	0.88 (−0.62 to 2.38)	5.09 (−0.76 to 10.94)	10.85 (−0.79 to 22.48)
Age	0.00 (−0.07 to 0.07)	0.02 (−0.03 to 0.08)	0.02 (−0.20 to 0.24)	−0.45* (−0.89 to −0.02)
Previous stress-related disorders	0.57 (−3.15 to 4.30)	0.55 (−2.45 to 3.55)	−4.76 (−16.44 to 6.91)	−9.84 (−33.07 to 13.39)
Previous anxiety and somatoform disorders	1.28 (−0.66 to 3.23)	0.51 (−1.05 to 2.08)	5.17 (−0.92 to 11.26)	1.61 (−10.51 to 13.73)
Previous mood disorders (yes vs no)	2.66* (0.35 to 4.97)	2.63** (0.77 to 4.49)	7.84* (0.59 to 15.09)	−3.31 (−17.74 to 11.12)
Previous other disorders	−0.75 (−0.30 to 4.97)	0.09 (−1.96 to 2.14)	−0.14 (−8.13 to 7.85)	5.73 (−10.17 to 21.62)
Model R^2 (F)	0.17*** (3.87)	0.20*** (4.49)	0.18*** (4.06)	0.10* (2.60)

Note: *$p < .05$; **$p < .01$; ***$p < .001$.

COVID-19 survivors, psychiatric and psychological follow-up evaluations are essential, and healthcare systems need to become better equipped to address the vulnerability of this population and mitigate the risk of further mental suffering (Gobbi et al., 2020).

Our findings also showed that having had a psychological consultation after discharge was associated with symptoms of anxiety and depression, as well as PTSD, but also with post-traumatic growth. We can assume that the association between psychological consultation and psychological symptoms is indicative of an appropriate referral to psychological care, whereby patients with significant psychological symptoms were those who requested or were referred to psychological consultation. At the same time, having received a psychological consultation after discharge was associated with post-traumatic growth. Our findings reveal that after hospitalization, some patients managed to give a new meaning to their lives, attribute new values to their relationships with others, and find new resources. These changes may be considered as signs of post-traumatic growth (Calhoun & Tedeschi, 2014). It is possible that the psychological consultation allowed patients to integrate traumatic memories, acknowledge emotions, and legitimize their intensity (Herman, 1998), therefore facilitating post-traumatic growth. The aim of the consultation with COVID-19 survivors was to stabilize the emotional condition and ensure an adequate response to their suffering. Therefore, the psychological intervention may have had the potential for patients to contain the emotional impact of COVID-19 and enhance post-traumatic growth.

Literature points out the significant association between post-traumatic stress and post-traumatic growth. Growth is associated with the presence rather than the absence of post-traumatic stress symptoms (Dekel, Ein-Dor, & Solomon, 2012; Park, Wilt, Russell, & Fendrich, 2022). Indeed, the distress may progressively trigger accommodation of the event into the patient's perspective and result in post-traumatic growth (Tedeschi & Calhoun, 2004). Park et al. (2022) pointed out that awareness and perceptions of growth can aid individuals in the adaptation process, thus acting as an effective coping mechanism.

Future studies could further investigate the role of post-traumatic growth and explore whether longer psychological support could prevent psychological sequelae in COVID-19 inpatients, even in the long term.

Finally, our results showed that young age was associated with post-traumatic growth. We might assume that younger people have greater plasticity and are more able to modify their perspective on life. However, as there are no data on the role of age in post-traumatic growth in the literature, future studies could investigate this aspect.

This study has several limitations that should be acknowledged. First, there is no control group of patients from subsequent pandemic waves. A control group may have helped us to understand whether the psychological sequelae found in this study are caused by COVID-19 disease or by the traumatic hospitalization that occurred during the first wave of the pandemic. An aspect to be considered is that a high prevalences of anxiety, depression, and post-traumatic stress have also been found in the general population in Italy (Franceschini et al., 2020; Mazza et al., 2020). Thus, future case–control studies could further investigate the role of hospitalization. Secondly, the number of patients enrolled in this study is limited. We observed a high dropout rate of respondents owing to the length of the psychological and psychiatric assessment. It is possible that participants who completed all of the testing were highly motivated or particularly vulnerable. For this reason, the results may not be generalizable to all patients hospitalized for COVID-19. Furthermore, as participants could complete the questionnaires over the telephone or online, the different modality of survey administration may have caused differences in the data, which could not be identified and controlled in this study.

Another potential limitation is related to the characteristics of our sample, which had a high mean age and a predominance of male patients. These characteristics can, however, be considered representative of the patients hospitalized in Lombardy during the first wave of the pandemic (Minnai, De Bellis, Dragani, & Colombo, 2022).

Finally, several different measures of mental health disturbance were employed, including self-report questionnaires and structured interviews based on different diagnostic systems. Although the advantage of this approach is that it enriched the perspective of our observation, not all measures could be directly compared.

The findings of this study have several clinical and practical implications. Given the prevalence of psychological symptoms among hospitalized COVID-19 survivors in the long term, interdisciplinary follow-ups should be implemented to monitor patients' mental health. There is clear evidence of the indirect effect of SARS-CoV-2 infection on the mental health of survivors, and psychological and psychiatric needs should not be overlooked during any phase of pandemic management (Cullen et al., 2020). This study contributed towards identifying groups of hospitalized COVID survivors who are more vulnerable to psychological distress. Patients with a personal history of a mood disorder should be the first recipients of targeted psychological interventions.

5. Conclusions

A high prevalence of anxiety, depressive symptoms, and PTSD was found among survivors 6 months after hospitalization for COVID-19. Anxiety and depressive symptoms and PTSD were associated with a previous diagnosis of a mood disorder and having received a psychological consultation. However, post-traumatic growth was found to be associated with younger age and having received a psychological consultation. Tailored psychological interventions could help to elaborate the psychological symptoms following hospitalization for SARS-CoV-2 infection and facilitate post-traumatic growth.

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