

## Original Research

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# The relationship among posttraumatic stress disorder, posttraumatic growth, and suicidal ideation among Italian healthcare workers during the first wave of COVID-19 pandemic

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**Abstract**

**Objective.** The COVID-19 pandemic impacted mental health across different groups, including healthcare workers (HWs). To date, few studies focused on potential positive aspects that may follow the exposure to the pandemic. We investigated the prevalence of posttraumatic stress disorder (PTSD) in Italian HWs and whether posttraumatic growth (PTG) dimensions affected the risk of suicidal ideation (SI) during the first COVID-19 wave.

**Methods.** An online self-report survey was conducted between April and May 2020. Socio-demographic data, information about COVID-19-related stressful events, Impact of the Event Scale-revised, and Post-Traumatic Growth Inventory-Short Form (PTGI-SF) scores were collected and compared between participants. Patient Health Questionnaire-9 scores were also collected to assess SI through item 9. Multivariate logistic regression was used to assess the relationship between PTGI and SI.

**Results.** Among 948 HWs, 257 (27.0%) reported a provisional PTSD diagnosis. The median PTGI-SF score was 24. Participants reporting PTSD symptoms had higher scores in the *Spiritual change*, *Appreciation of life*, and *New possibilities* domains, and in the total PTG scale. A total of 100 HWs (10.8%) screened positive for SI. Improvements in *Relating to others* domain of PTGI-SF (odds ratioOR: .46; 95% confidence interval: .25–.85) were associated with lower odds of SI.

**Conclusions.** COVID-19 pandemic has been indicated as a risk factor for SI, also among HWs. PTG may have a protective role on suicide risk. Improvements in *Relating to others* domain reduced odds of SI, consistently with the role of loneliness and lack of connectedness with others in enhancing suicidal risk.

**Introduction**

Extensive research has focused on the negative consequences of the COVID-19 pandemic on mental well-being. A number of studies have been especially investigating depressive, anxiety, and posttraumatic stress disorder (PTSD) symptoms arising in the wake of the pandemic and social distancing restrictions.<sup>1</sup> However, only little attention has been devoted to positive psychological changes that may develop in the aftermath of a stressful event. Beyond increasing the risk for psychiatric illness, traumatic events may also promote post-traumatic growth (PTG), which refers to thriving on traumatic circumstances while achieving greater appreciation of life and relationships, enhanced spirituality, increased awareness of personal strength, and identification of new possibilities in one's life. As PTG is experienced by a large number of trauma survivors and associated with a beneficial effect on functioning,<sup>2</sup> addressing the correlates of PTG might be as crucial as addressing those of PTSD.

Healthcare workers (HWs) have been shown to be at elevated risk for COVID-19-associated mental health issues, such as PTSD, depression, anxiety, and suicidal ideation (SI).<sup>3</sup> While several sociodemographic and work-related factors were found to be associated with the propensity to develop mental health problems among HWs, a more comprehensive understanding still lacks the assessment of possible positive factors. A recent study, conducted during COVID-19 pandemic in a sample of US veterans, found that moderate to high levels of PTG were present in slightly less than a half of veterans, with markedly higher percentage among those with COVID-19-associated PTSD symptoms and a significant effect of some PTG dimensions in

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reducing the odd for SI.<sup>4</sup> In light of these findings, the present study analyzed data from a national sample of HWs gathered during the first wave of COVID-19 in Italy, aiming to evaluate (a) the prevalence of COVID-19-associated PTG among HW with and without COVID-19-associated PTSD symptoms and (b) the association between PTG and SI during the first wave of the pandemic.

## Methods

This is a cross-sectional, web-based survey study, conducted during the first wave of COVID-19 in Italy. Study procedures are extensively elucidated elsewhere.<sup>5</sup> Briefly, answers were collected between April 4 and May 13, 2020, the late phase of the first stay-at-home order in Italy. An invitation letter presenting the research and containing the link to the survey was sent to healthcare institutions, physicians', and nurses' associations and circulated through groups of health professionals on social networks and researchers' direct contacts. Participants gave their informed consent to participate in this study and to have their personal, clinical, and demographic data used for research purposes. Their answers were collected anonymously. The study was conducted in accordance with the Declaration of Helsinki and all participants provided informed consent. The study protocol was approved by the Department of Psychiatry of the ASST Fatebenefratelli-Sacco of Milan as relevant institutional review board for low-risk studies (code: dsm 12–20).

## Participants

The inclusion criterion was being an HW actively working in Italy during the pandemic. Any professionals involved in rehabilitation, diagnostic, and administrative activities were invited to participate.

## Assessments

### Post-traumatic growth

COVID-19-related PTG was assessed using the Posttraumatic Growth Inventory-Short Form (PTGI-SF)<sup>6</sup>. One total score and 5 subscores including *Appreciation of life*, *Relating to others*, *Personal strength*, *Spiritual change*, and *New possibilities* were calculated. In proceeding with previous studies using the PTGI-SF,<sup>2,4</sup> item responses were also dichotomized based on moderate or greater endorsement. Endorsement at a moderate or greater level of both items composing each PTGI-SF domain was indicative of endorsement of the whole domain. Additional details regarding the Italian-validated version of PTGI-SF and chosen cut-offs are provided in the [Supplementary Material](#).

### COVID-19-related PTSD symptoms

Participants were invited to fill the Impact of Event Scale-Revised (IES-R) if they answered positively to a screening question (*In the past month, did you significantly felt on guard/easily startled or detached from others/surrounding or disturbed by repeated/unwanted memories of the COVID-19 epidemic (or something you experienced because of it) or avoidant of situations that reminded you of it (or something you experienced because of it)?* While the IES-R is not meant to be a diagnostic tool, a total score of 33 has been indicated as having good diagnostic sensitivity (0.91) and specificity (0.82) compared to a clinical diagnosis.<sup>7</sup> The Italian version has also shown optimal psychometric properties and validity.<sup>8</sup>

### Suicidal ideation

SI was assessed using the Patient Health Questionnaire-9 (PHQ-9). A positive screen for SI was indicated by a response of "several days," "more than half the days," or "nearly every day" to the Item 9 (*thoughts that you would be better off dead, or of hurting yourself in some way*).

### Statistical analysis

Descriptive statistics were used to assess frequencies of socio-demographic and clinical characteristics. A multivariable logistic regression analysis was used to examine the association between PTGI and SI, after adjustment for background characteristics and clinical features. Data were analyzed using the SPSS software program, version 27.0 (IBM Corp). All *P*-values are two-sided, and statistical significance was set at *P* < .05. Additional details regarding the PTGI-SF are provided in the [Supplementary Material](#).

## Results

Of the 948 participants, 931 completed both IES-R and PTGI, and were therefore included in the final sample. As the survey was circulated with the assistance of healthcare institutions, associations, and social networks, the response rate could not be calculated. The mean (SD) age was 45.1 (11.8) years, 592 (63.7%) were females, 441 (47.4%) were from Lombardy, and the remaining 489 (52.6%) were from other Italian regions. In total, 723 (77.7%) were physicians, 104 (11.2%) were nurses, and 103 (11.1%) were a mixed group mostly composed by midwives, rehabilitation personnel, and laboratory technicians. [Table 1](#) shows the sociodemographic and clinical characteristics of all included participants. Regarding IES-R, 553 (58.3%) HWs reported a particularly stressful event. A total of 257 (27.6%) screened positive for COVID-19-associated PTSD symptoms. The median PTGI-SF score was 24.

The most endorsed domain of PTGI-SF at a moderate or greater level was *Appreciation of life* (79.6%), the least endorsed was *Spiritual change* (41.7%) ([Table 1](#)). HWs who screened positive to COVID-19-associated PTSD symptoms scored higher than those who screened negative on the total and *Spiritual change*, *Appreciation of life*, and *New possibilities* domain scores of PTGI-SF ([Figure 1](#)).

A total of 100 HWs (10.8%) screened positive for SI as assessed through item 9 of the PHQ-9. After adjusting for background and pandemic-associated risk factors, COVID-19-associated improvements in *Relating to others* domain of PTGI-SF (odds ratio [OR]: .46; 95% confidence interval [CI], .25–.85) was independently associated with lower odds of SI ([Table 1](#)).

## Discussion

The majority of HWs, mostly females and physicians, participating in this study in the wake of the first outbreak of COVID-19 in Italy, endorsed several dimensions of PTG at a moderate or greater level, the most prevalent being the domains of *Appreciation of life* (79.6%) and *Personal strength* (76.9%). This is consistent with 2 small studies reporting about PTG in samples of nurses facing COVID-19 pandemic, where the highest item mean scores were in the domains of *Appreciation of life* and *Personal strength*.<sup>9,10</sup> On the other hand, spiritual growth was found to be the PTGI-SF

**Table 1.** Sociodemographic, Pandemic, and Clinical Characteristics of the Sample and Results of Multivariate Regression Model Examining Their Association with Current Suicidal Ideation

	Sample characteristics, N (%) (n = 931)	Current suicidal ideation OR (95% CI)
<b>Background characteristics</b>		
<i>Age</i>		
Younger than 40	375 (40.3)	1
40 or older	556 (59.7)	1.62 (0.78–3.41)
<i>Sex</i>		
Female	593 (63.7)	1
Male	338 (36.3)	1.60 (0.89–2.86)
<i>Region</i>		
Lombardy	441 (47.4)	1.93 (1.03–3.62) <sup>a</sup>
Other regions	490 (52.6)	1
<i>Date of completion</i>		
Before May 4, 2020	697 (74.9)	1
May 4, 2020 or later	234 (25.1)	0.85 (0.43–1.68)
<i>Minor children</i>	336 (36.1)	0.55 (0.32–0.97) <sup>a</sup>
<i>Adult children</i>	239 (25.7)	2.05 (0.91–4.60)
<i>Living parents</i>	716 (76.9)	1.38 (0.65–2.90)
<i>Profession</i>		
Physician	724 (77.8)	1
Nurse	104 (11.2)	1.04 (0.45–2.41)
Other	103 (11.1)	1.40 (0.48–4.13)
<i>Length of service</i>		
Up to 15 years	490 (52.6)	1
More than 15 years	428 (46.0)	0.34 (0.13–0.90) <sup>a</sup>
<b>Pandemic-associated factors</b>		
<i>Workplace</i>		
Frontline	88 (9.5)	1
Inpatient no frontline	144 (15.5)	5.18 (0.98–27.38)
Outpatient/territorial medicine	283 (30.4)	6.59 (1.26–34.39) <sup>a</sup>
Services/other	416 (44.7)	5.94 (1.16–230.268) <sup>a</sup>
<i>Adequate PPE</i>	421 (45.2)	0.75 (0.43–1.31)
<i>Change in usual tasks</i>	261 (28.0)	0.95 (0.47–1.90)
<i>Relocation to other units</i>	179 (19.2)	1.23 (0.55–2.79)
<i>Relocation to COVID-19 units</i>	286 (30.7)	0.94 (0.43–2.03)
<i>Unusual exposure to suffering/death</i>	420 (45.1)	1.24 (0.68–2.26)
<i>Infection, self</i>	82 (8.8)	1.17 (0.45–3.08)
<i>Infection, relatives/close friends</i>	296 (31.8)	1.00 (0.53–1.90)
<i>Death following infection, relatives/close friends</i>	261 (28.0)	1.13 (0.50–2.53)
<i>Death following infection, colleagues</i>	112 (12.0)	0.62 (0.21–1.84)

**Table 1.** Continued

	Sample characteristics, N (%) (n = 931)	Current suicidal ideation OR (95% CI)
<i>Separation from cohabiting relatives</i>	115 (12.4)	0.91 (0.45–1.83)
<i>Separation from noncohabiting relatives</i>	862 (92.6)	0.70 (0.29–1.72)
<b>Clinical factors</b>		
<i>Previous mental disorders</i>	235 (25.2)	1.79 (1.04–3.07) <sup>a</sup>
<i>Positive IES-R screen for PTSD</i>	258 (27.7)	1.53 (0.84–2.78)
<b>PTGI-SF dimensions</b>		
<i>Appreciation of life</i>	741 (79.6)	1.67 (0.81–3.45)
<i>Relating to others</i>	642 (69.0)	0.46 (0.25–0.85) <sup>a</sup>
<i>Personal strength</i>	716 (76.9)	0.79 (0.43–1.45)
<i>Spiritual change</i>	382 (41.0)	1.70 (0.96–3.03)
<i>New possibilities</i>	610 (65.5)	0.54 (0.29–1.01)

Note: The table shows sociodemographic, pandemic, and clinical characteristics and ORs of suicidal ideation of each factor.

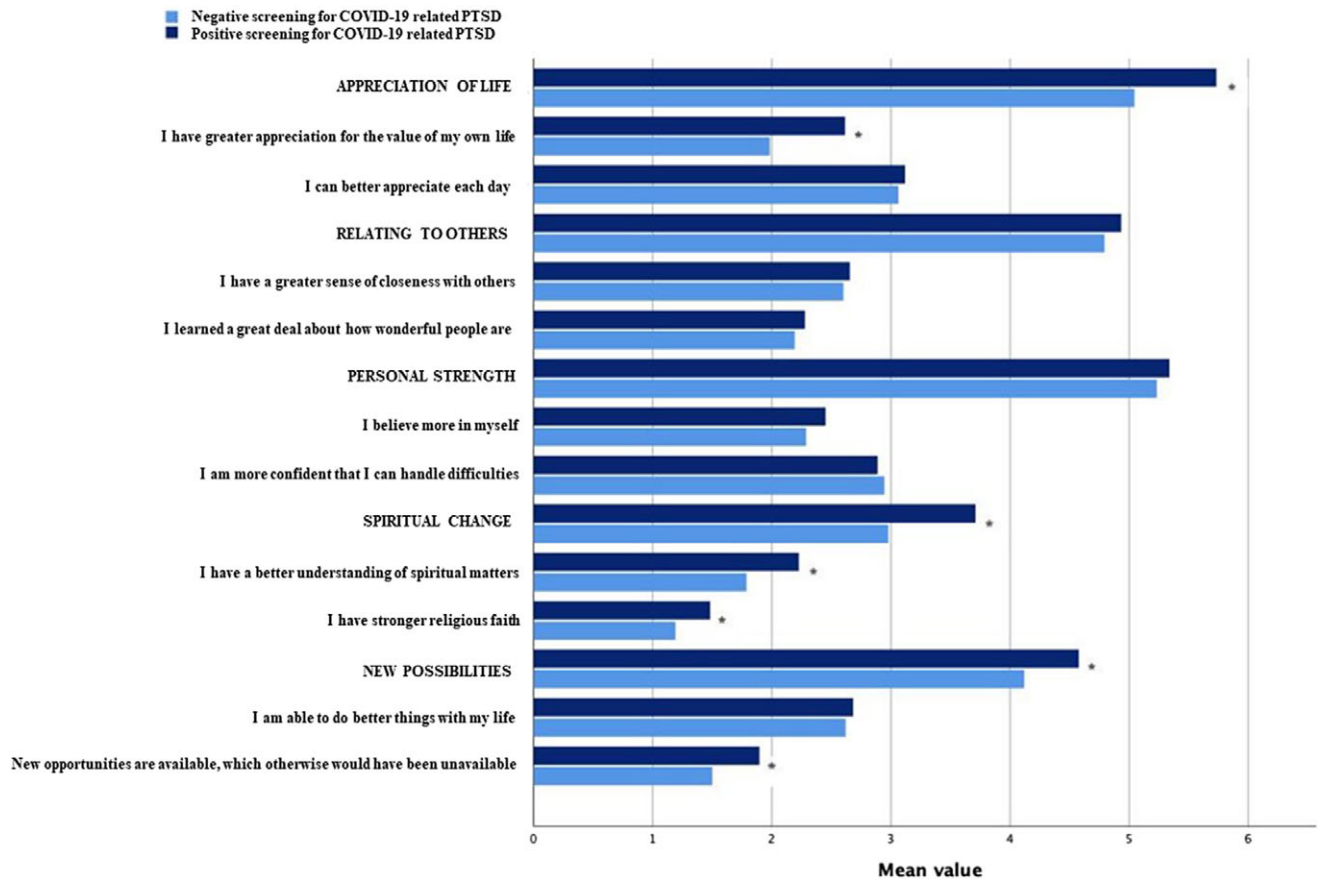
<sup>a</sup>P-values < 0.05.

dimension with the lowest mean score, accordingly to recent data from literature.<sup>11</sup>

Albeit concerns have been raised about the contribution of COVID-19 in suicide risk among HWs,<sup>12,13</sup> no studies evaluated whether PTG stemming from COVID-19 pandemic may exert a protective effect against SI. Greater improvement in *Relating to others* significantly reduced the odd of SI in our sample. This is consistent with the role of loneliness and lack of connectedness with others in enhancing the risk of suicide<sup>14</sup> and provides support to the implementation of interventions targeting PTG-driven relatedness with others to prevent and address SI among HWs. Notably, having a provisional PTSD diagnosis was not related to increased odds of SI, suggesting that such interventions could profitably be addressed to the whole population of HWs, independently from the presence of clinically significant PTSD symptoms. Somewhat in parallel, higher scores in *Relating to others* domain were not influenced by having a provisional PTSD diagnosis in the comparative analysis. This latter seems to confirm that PTG and PTSD does not develop one from another, nor are mutually exclusive, as they both represent different outcomes that may occur after exposure to a traumatic event.<sup>15</sup> From this perspective, PTG may represent an independent target of intervention to promote post-traumatic adjustment and psychological well-being in populations exposed to traumas.

**Conclusions**

PTG may have a protective role against SI among HWs facing a global pandemic, especially when the dimension of relatedness to others is enhanced in the process of adjustment. Limitations of the study include the lack of information about the response rate of the survey, the use of self-report instruments, and the cross-sectional study design. Moreover, even though the presence of previous mental disorders was assessed as possible confounding factor (25.2% in our sample), the occurrence of psychopharmacological/



**Figure 1.** Comparison between scores at the PTGI of subject with versus without PTSD. The figure shows the comparison between the mean scores in each PTGI-SF domain and subdomain of participants reporting COVID-19-related PTSD symptoms and those not showing PTSD symptoms.

psychological treatments was not assessed and might have biased the results. Lastly, since our data were collected in a relatively precocious phase of COVID-19, follow-up data on the long-lasting effects of the pandemic and the longitudinal course of PTG among HWs are needed. Studies replicating these findings and assessing changes in PTG and SI over time are warranted, as well as developing evidence-based interventions enhancing PTG and helping HWs to manage stressors during and beyond COVID-19 pandemic.

**Supplementary material.** The supplementary material for this article can be found at <https://doi.org/10.1017/S1092852923002493>.

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