


## ORIGINAL ARTICLE

# Cancer and Covid-19: A preliminary study on the trauma aspects of coronavirus in cancer patients

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## Abstract

**Objective:** Because of Covid 19, it has become necessary to revise the treatment of cancer patients (“how” and “when”). That has had important psychological repercussions. The purpose of this study is the evaluation of the impact of Covid19 in terms of Post-Traumatic Stress Disorder and Depression and the potential association with coping strategies.

**Methods:** We conducted an exploratory study with 106 patients undergoing treatment, using following questionnaires: Screening Questionnaire for Disaster Mental Health and Mini-Mental Adjustment to Cancer.

**Results:** Only 25.5% of our sample showed symptoms of posttraumatic stress disorder (PTSD) and 6.6% revealed a probable presence of depression. In addition, it came up a significant correlation between SQD\_P and the coping styles “Hopelessness” ( $r = 0.41$ ,  $p < 0.001$ ) and “Anxious Preoccupation” ( $r = 0.45$ ,  $p < 0.001$ ). A strong correlation also emerged between non-Covid 19 patients and PTSD ( $r = 0.29$ ,  $p = 0.002$ ).

**Conclusions:** Our preliminary data did not reveal a prevalence of PTSD, but the persistence of the health emergency requires to focus future research on protective and risk factors related to PTSD and psychological distress in cancer patients, in order to reduce the mental health burden of Covid19.

## KEYWORDS

cancer, Coping style, COVID-19, depression, oncological patients, oncology, post traumatic stress disorder

## 1 | BACKGROUND

Since December 2019, the world health community has been facing an outbreak of coronavirus infection (Covid19) caused by SARS-CoV-2, first detected in Wuhan, China, that has progressively spread into several countries.<sup>1</sup>

When Europe emerged as the epicenter of Covid19, Italy quickly became a “Red-zone” area, according to the classification based on

Ministry of Health orders.<sup>1</sup> The Italian government responded to the health emergency with a forced closure and with restrictions on health facilities, whose impact, combined with the fear of contagion, have been greatly affecting the psychological well-being of most of the Italian population.<sup>2</sup>

Cancer patients turned out to be more susceptible to Covid19 infection than healthy population, because of their immunodepression status, caused by malignancy and anticancer treatment,

such as chemotherapy, targeted therapy, and immunotherapy.<sup>3</sup> Consequently, consultations and access of patients in our oncology department had to be reorganized.

Currently cancer patients' needs have completely changed and their feeling of safety too,<sup>4</sup> posing new welfare challenges in a so special care context.

Cancer diagnosis and treatment usually lead to a great psychological distress for patient, from anxiety to depression.<sup>5</sup> Several studies showed that, compared to healthy subjects, cancer patients have higher risk of developing mental health disorders,<sup>6,7</sup> which can decrease treatment adherence, survival rate and quality of life.<sup>8,9</sup> Based on this evidence, the psychological impact of Covid19 on oncology population seems to be deeply significant.<sup>2-10</sup> Depression, anxiety, stress-related disorders, sleep disturbance, confusion, anger emotions but also physical symptoms and an increased fatigue,<sup>12,13</sup> caused by Covid19 pandemic arise on top of the already existing traumatic experience of cancer diagnosis.

With regard to chemotherapy treatments, many important changes have occurred in several hospitals: delay in treatments, modification of chemotherapy regimens, and prolongation of intervals between treatment cycles.<sup>6</sup>

These changes, coupled with loneliness and imposed social isolation, have become additional sources of stress for cancer patients,<sup>14,15</sup> with the risk of developing PTSD (Diagnostic and Statistical Manual of Mental Disorders, Fifth edition).<sup>16</sup> Recent research has measured and compared, in actively treated patients, fear and anxiety, combined with the new coronavirus and the cancer itself.<sup>17</sup> From a clinical perspective, cancer is considered more life-threatening than Covid19 infection.<sup>17</sup> Cancer diagnosis and the related treatments are responsible for a highly stressful and potentially traumatic experience,<sup>18,19</sup> validating an important correlation between cancer disease and trauma.<sup>20,21</sup>

Depression has been shown to be more prevalent in cancer patients than in the rest of the population. Although neurobiological factors may play a role in the connection between cancer and depression, evidences suggest that, depression may depend on the interaction of various factors of risk and vulnerabilities.<sup>22</sup>

In a recent study focused on mental health implications for cancer patients during the pandemic context of Covid19, patients showed a prevalence of 23.4% depression and 9.3% PTSD<sup>11</sup>

Another investigation discovered higher levels of stress and symptom burden in patients with cancer, compared with previous thresholds and levels on par with non-cancer patients with PTSD.<sup>23</sup>

Most people feared a cancer diagnosis. With the rapid spread of Coronavirus the dreaded "letter C" diagnoses became two.<sup>24</sup>

The investigation of the psychological impact of Covid19 in cancer patients in terms of PTSD and Depression was the main purpose of our study.

In second place, we explored possible associations with coping strategies. Lastly, we investigated the association between covid infected people and PTSD, depression, and coping styles.

Coping have been described as significant factors in cancer patients' quality of life and psychological well-being.<sup>25</sup> Coping styles are

psychological patterns that people use to control thoughts, feelings, and actions encountered during several stages of stressful experiences.<sup>26</sup> Five coping styles are reported in the literature<sup>27</sup>: *fighting spirit* (i.e. the tendency to challenge and actively face the illness), *anxious preoccupation* (i.e. the tendency to experience the illness as a source of marked anxiety and tension), *fatalism* (i.e. the tendency to have a resigned and fatalistic approach to the illness), *hopelessness-helplessness* (i.e. the tendency to react to the illness with a pessimistic attitude), *cognitive avoidance* (i.e. the tendency to avoid direct confrontation with illness-related issues). In view of what has been so far documented, our hypothesis is to discover significant levels of PTSD and Depression in our cancer patient population, both of which correlated with less adaptive coping strategies.

## 2 | METHODS

### 2.1 | Participants and procedure

This prospective, observational study was conducted in the Oncology Department of Fondazione Poliambulanza, Brescia, Italy, between November 2020 and April 2021. One hundred seventy-five questionnaires were proposed, only 106 of them were considered valid for research purposes. Forty-seven questionnaires were rejected by patients because of fatigue, unavailability, or language obstacles. The remaining 22 questionnaires were incomplete or the signature on the informed consent was omitted. Inclusion criteria were: a cancer diagnosis, a minimum age of 18 years and the absence of diseases impairing cognitive functions (dementia, ischemia, etc.).

Questionnaires were collected mostly during the day hospital therapy, at the time of the morning blood draw in dedicated rooms. Other questionnaires were filled out by patients hospitalized for multi-day chemotherapy in inpatient rooms. Self-report measures were overseen by trained psychologists. The participants provided written informed consent, after the aim of the research had been outlined.

The sample consisted of 42 males and 64 females, in the age range 31-80 ( $M = 58,24$ ;  $SD = 12,17$ ). The participants filled out the paper-pencil questionnaires in approximately 15 min. Data were collected in the anonymity and the contributors did not receive any form of payment. They were free to withdraw from participation at any time. The research was conducted in accordance with the stated ethical standards and the Ethical Committee of Brescia approved the protocol.

### 2.2 | Measures

#### 2.2.1 | Screening Questionnaire for Disaster Mental Health – SQD (Valenti et al., 2013)

To conduct the study we used the validated Italian version of the Screening Questionnaire for Disaster Mental Health (SQD) - SQD, an instrument for the screening of PTSD and depression in long term aftermath of a natural disaster.

The questionnaire included 12 questions, nine of them related to three subscales of the PTSD diagnosis: intrusion ("Do you have nightmares about the event in your sleep?"), avoidance ("Do you avoid places, people, topics associated to the event?") and hyperarousal ("Do you feel upset when something reminds you of the event?"). The remaining three items focused on major depressive disorder and investigated depressed mood (Do you feel depressed?), decreased appetite ("Have you noticed any changes in appetite?"), and fatigue ("Do you feel easily get tired or feel tired all the time?"), with dichotomous responses, "yes" or "no." All the items were based on the DSM-V diagnostic criteria for PTSD and major depression.<sup>8-28</sup> The scoring methodology utilized the Likert scale measuring PTSD and depression: "Currently little chance of PTSD" (0-3); "Moderate PTSD"<sup>4,5</sup>; "Possible PTSD"<sup>6-9</sup>; "Unlikely depression" (0-4); and "Possible depression".<sup>5,6</sup> Several studies have compared the effects of the Covid19 with the symptomatology of catastrophic events' victims, such as earthquakes, fires, or floods,<sup>29</sup> which is the reason why the SQD was chosen as the primary survey tool.

## 2.2.2 | Mental adjustment to cancer (Grassi et al., 2005)

To assess coping strategies we also employed the Italian version of the Mini-Mental Adjustment to Cancer (Mini-MAC) Scale (Mini-MAC Scale Grassi et al., 2005). This questionnaire consisted of 29 items with four possible responses, ranging from one ("strongly disagree") to four ("strongly agree"). Five coping strategies were assessed: "fighting spirit" ("I am determined to beat cancer"), "hopelessness/helplessness" ("I don't have much hope for the future"), "fatalism" ("I have put myself in God's hands"), "anxious preoccupation" ("I feel very anxious about this disease"), and "cognitive avoidance" ("Not thinking about it helps me to respond").

## 2.3 | Data analysis

To analyze the results we employed SPSS Software (Statistical Package for Social Science - version V28) for Windows, with two-sided values of  $p < 0.05$  being used as (the) statistical significance threshold in this analysis. Descriptive statistics were produced for sociodemographic characteristics, stage of disease, primary site of cancer, and personal experiences related to covid-19. Correlations between variables were calculated using Pearson's Product-Moment while Content analysis was used to analyze individual questionnaires.

## 3 | RESULTS

### 3.1 | Socio-demographic and clinical characteristics

Questionnaires were proposed to 175 diagnosed people with cancer. One hundred six participants returned their questionnaires, 47

people declined to participate in the study, and 22 questionnaires were incomplete and consequently unsuitable for the research.

The characteristics of the sample are listed in Table 1. The majority of the patients were women (60.4% vs. 39.6% men), with a median age of 58.24 years (range 31-80). Most participants were married (70.8%), retired (44.1%), or employed (41.9%), and had a high school education (48.5%). It is worth nothing that the majority of patients had a metastatic disease (51.4%). The primary site of the disease in our sample were digestive tract (45.7%) and breast (32.4%). At the time of COVID-19, the large majority of the participants claimed they did not become injured (95.3%) and had not come into contact with people infected with the virus (91.5%). Despite the absence of their caregiver, a significant part of the participants reported to feel peaceful (40.8%) and courageous (36.5%) and the hospital was seen as a secure place by the majority of patients (77.1%). These data were investigated with three semi-structured questions: 1. Whether patients had contracted covid or had come into contact with people infected by the virus; 2. How patients perceived the hospital

TABLE 1 Socio-demographic and clinical characteristics (n = 106)

Patients		n	%
Gender	Male	42	39.6
	Female	64	60.4
Age	Mean	58.24 (31-80)	
Education	Primary school	8	7.9
	Middle school	24	23.8
	High school	49	48.5
	University	20	19.8
Marital status	Married	75	70.8
	Live together	9	8.4
	Divorced	4	3.8
	Widowers	7	6.6
	Single	11	10.4
Employment status	Employed	39	41.9
	Retired	41	44.1
	Not employed	13	14
Disease stage	Local	51	48.6
	Metastatic	54	51.4
Site of disease	Digestive	48	45.7
	Breast	34	32.4
	Urogenital	10	9.5
	Airway	7	6.7
	Gynecological	2	1.9
	Soft tissue	2	1.9
	Other sites	2	1.9

(safe/unsafe place); 3. How patients experienced the absence of caregivers in the hospital because of anti-infection restrictions.

### 3.2 | posttraumatic stress disorder and depression

The results show that Post Traumatic Stress Disorder is present overall in 25.5% of the sample (13.2% moderate PTSD and 12.3% possible PTSD) while major depressive disorder occurs in 6.6%. In particular, the SQD-P 6–9 score was reached by 13 subjects (12%,3%), putting them over a possible PTSD diagnosis threshold. The SQD-P 4–5 score was achieved by 14 subjects (13%,2%), putting them over the cut-off for a diagnosis of moderately probable PTSD. With reference to SQD-D, score 5–6 was related to seven individuals (6%.6%), indicating they were over the cut-off for a diagnosis of probable depression (Table 2). Patients with possible or moderate PTSD report irritability, sleeping disorders, recurrent and intrusive memories and a tendency to withdraw. Patients with probable depression report low energy, low appetite and mood swings.

TABLE 2 Screening questionnaire for disaster mental health (SQD) (Valenti et al., 2013)

SQD-P	F	%	SQD-D	F	%
0–3	79	74.5	0–4	99	93.4
4–5	14	13.2	5–6	7	6.6
6–9	13	12.3			

Note: SQD-P: 0–3 Currently little possibility of PTSD; 4–5 PTSD moderate; 6–9 PTSD possible SQD-D: 0–4 D unlikely; 5–6 D possible.

TABLE 3 Coping style's frequencies

	Min	Max	Mean	SD
Fighting spirit	4	16	11.91	2.377
Hopelessness	8	29	12.99	4.466
Fatalism	5	20	13.70	3.280
Anxious preoccupation	8	31	17.92	5.247
Cognitive avoidance	4	16	10.73	2.974

TABLE 4 Correlations between Mini-Mac and coping styles and covid19 infection

	SQD_P	SQD_D	Fighting spirit	Hopelessness	Fatalism	Anxious preoccupation	Cognitive avoidance	Covid infection
SQD_P	-	0.756**	-0.032	0.415**	0.243*	0.456**	0.240*	0.291**
SQD_D		-	-0.053	0.415**	0.093	0.427**	0.039	0.048
Fighting spirit			-	-0.236*	0.492**	-0.001	0.392**	-0.019
Hopelessness				-	0.187	0.573**	0.096	0.063
Fatalism					-	0.283*	0.491*	0.102
Anxious preoccupation						-	0.323**	0.033
Cognitive avoidance							-	-0.063
Covid infection								-

Note:  $p^* < 0.05$ ;  $p^{**} < 0.001$ .

### 3.3 | Coping styles

The means and standard deviations related to the investigation of the different coping strategies used by our group of cancer patient are shown in Table 3.

The results show a higher frequency for the coping style “Anxious Preoccupation”. The patients consider the disease a source of anxiety over which they have no control. On the contrary, the occurrence of the “Cognitive Avoidance” coping style seems low, whereby the patients try to distract themselves wherever possible, decreasing the burden of the disease on their daily life.<sup>27</sup>

### 3.4 | Correlations between Mini-Mac, coping styles and covid19 infection

Spearman's correlation was used to measure correlations between Mini-Mac domains and domains measuring depression and PTSD depression. Two-tailed annex experiments were performed at a significance level of 0.05 (Table 4).

A strong correlation was found between SQD\_P and the coping styles “Hopelessness” ( $r = 0.41$ ,  $p < 0.001$ ) and “Anxious Preoccupation” ( $r = 0.45$ ,  $p < 0.001$ ). Besides, moderate correlations emerged between SQD\_P and the coping styles “Fatalism” ( $r = 0.24$ ,  $p = 0.01$ ) and “Cognitive avoidance” ( $r = 0.24$ ,  $p = 0.01$ ). Furthermore, there were positive correlations between SQD\_D and the coping styles “Hopelessness” ( $r = 0.41$ ,  $p < 0.001$ ) and “Anxious Preoccupation” ( $r = 0.42$ ,  $p < 0.001$ ).

Finally a significant correlation was found between “Covid Infection” and SQD-P ( $r = 0.29$ ,  $p = 0.002$ ).

## 4 | DISCUSSION

The incidence of mental health disorders is greater in cancer patients than in the general population.<sup>7</sup>

Due to the Covid-19 pandemic, cancer patients experienced significant psychological distress caused by extended screening, specialist visits, and delayed treatment. Recent research revealed

that this subgroup appears to have higher rates of anxiety and hopelessness than general population.<sup>11</sup>

Based on this evidence, we expected that the emotional distress in cancer patients during the Covid-19 pandemic could develop a PTSD, identified like a life-threatening disease.<sup>30</sup> Depression, as PTSD, could have a relation with psychological fragilities, experienced in this period of pandemic, both associated with more or less adaptive coping-strategies.<sup>31</sup> Detected data did not confirm our original hypothesis to find a significant level of PTSD and Depression. This finding might suggest that our patients attributed the risk of losing life more to cancer diagnosis than to Covid 19, and thus were psychologically more engaged in cancer disease management.

It also worth noting, however, that 74.5% reported a low likelihood of PTSD and, similarly, 93.4% of patients did not show any risk to develop Depression. According to our clinical experience and to recent literature, we can hypothesize that patients under treatment perceived chemotherapy as a helpful tool to cope with cancer,<sup>32,33</sup> not living passively the situation.

To be underlined that the questionnaire collection was time-consuming, considering the safety and containment measures put in place to reduce risk of infection with Covid 19. Only few patients, selected on the basis of clinical criteria linked to urgency and need, could access the department daily.

These early results could also be related to the high percentage of patients (77.1%) that reported to perceive the hospital as a safe place, despite the restrictions, included limited access to caregivers.

From our perspective, perceiving the hospital as a safe place may be the effect of not having suspended treatment, even if selected, ensuring in this way continuity of care, both medically and psychologically. Looking at our sample, 25.5% of participants report moderate or probable levels of PTSD and only 6.6% the presence of depressive experiences.

Although the data do not show a significant presence of PTSD and Depression in our sample, they still suggest experiences of dual trauma in cancer patients that were diagnosed with cancer and had to deal with the risks associated with the pandemic. Indeed, from a review of the literature, both factors represent trauma, that is, a stressful event with no chance of escape, which exceeds the individual's tolerance level when loneliness, uncertainty, loss of control, and ideas of mortality are experienced.<sup>34,35</sup> The prevalence of PTSD compared to depression could be related to the hyperactivation symptoms of the disorder. Those, who develop PTSD, show hypersensitivity to possible danger signals, activate a continuous state of alertness and live in a condition of hypervigilance and tension.<sup>30</sup> In this perspective we might suppose that hyperactivation prevails over a state of apathy or demoralization, typical of a depressive trait.

We did not make any comparisons with other geographic areas, still it is possible to assume that the reason of the referred percentage of PTSD lies in the location of our hospital, in one of the worldwide most highly affected areas. This may be an independent risk factor for PTSD even if people, and people those close to them, did not contract the disease.<sup>7,16-37</sup>

Finally, the findings revealed that "Anxious Preoccupation" and "Hopelessness" are the coping styles mostly correlated with PTSD and Depression, which are also the more frequent ones in our sample.

Anxiety and preoccupation are feelings that accompany cancer patients throughout their path from diagnosis to treatment.<sup>38,39</sup> Therefore, it is possible to speculate that this psychological state was amplified by perceiving oneself as part of a "fragile" category and by the non-availability of a vaccine at the time we conducted our study.<sup>2-20</sup>

With regard to the coping style "Hopelessness", we can hypothesize that the health emergency has activated, as by cancer diagnosis, the fear of immediate death.

In support of the above interpretations, the results also show a significant correlation between patients without covid19 and PTSD.

Even if 95%,3% of our stressed group has not been infected with the virus, we can observe an increasing anxiety. Some patients may have endured "vicarious trauma," having experienced indirect consequences of the virus (e.g., relatives, close friends, significant others, infected, hospitalized or died due to Coronavirus).

Despite the greater presence of anxiety/preoccupation as a coping style, it is interesting to note that patients reported a feeling of safety entering the hospital without caregivers. From our clinical experience, we assume that these figures, generally considered source of security and support, were instead perceived by patients as possible vehicles of contagion because of the pandemic. This hypothesis can also be supported by the sense of calm and courage expressed by patients, in relation to the access ban to caregivers in the ward.

#### 4.1 | Study limitations

Some limitations of our preliminary study have to be pointed out. Firstly, the descriptive and observational nature of the research did not include a comparison with a control group. Therefore, it might be important to develop the investigation by comparing the oncology population with a control group of healthy people. Secondly, as already outlined, we chose SQD as investigative tool, because several studies have compared the effects of Covid19 to the symptomatology of victims of catastrophic events. At the time of data collection there was no validated scientific instrument already available in the literature for the purpose of investigating the psychological effects of the pandemic. But the instrument does not refer to the pandemic specifically and this should be considered a limitation of the research.

Thirdly, it was not investigated whether patients had already started cancer treatments before the pandemic or, instead, had been diagnosed during this period of health emergency. This finding could make a difference with respect to patients' experience and consequently the coping mechanisms activated during questionnaire collection.

## 4.2 | Clinical implications

A multi-center study on the relationship between PTSD, depression, and coping styles would be desirable, as it could increase the complexity and informational value of this research. Furthermore, the promising correlations found in our study lead to consider, for further studies, a regression analysis, in order to explore whether coping styles might predict PTSD or depressive symptoms in a larger sample. Finally, considering the long-term effects of such a stressful historical context, especially with regard to the onset of PTSD, it could be worth a follow up, so as to observe trends in both depression and PTSD.

## 5 | CONCLUSIONS

The persistence of the health emergency makes the future still uncertain, therefore, the psychological consequences of the pandemic are likely to last a long time yet. Our preliminary data suggest that, although no prevalence of PTSD has been found, the oncologic condition could make individuals more vulnerable to PTSD and to chronic psychological distress. To date, the mental health risks associated with COVID-19 have yet to be understood. It is therefore of central importance to increase future research on protective and risk factors related to PTSD and psychological distress in cancer patients, in order to reduce the mental health burden of COVID-19.

### CONFLICTS OF INTEREST

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the topic or materials discussed in this manuscript. No competing financial interests exist.

### ETHICS STATEMENT

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The present study was approved by the Ethics Committee of Brescia, Italy, approval No. 4505.

### DATA AVAILABILITY STATEMENT

The Data that support the findings of this study are available from the corresponding author upon reasonable request.

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