The Impact of the COVID-19 Pandemic on Anxiety and Depression in Breast Cancer Patients in Tunisia

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Abstract

**Objective:** The COVID-19 generated an unprecedented set of emotional challenges for cancer patients. We aimed to investigate the impact of COVID-19 on anxiety and depression in breast cancer patients.

**Method:** Between September and December 2020, women aged 18 years old or older with breast cancer (stage I to IV) who have started treatment before the onset of the pandemic were included. They must have an evaluation of anxiety and depression with the HAD scale before the onset of COVID-19. After inclusion, each patient was asked to complete the HAD scale to evaluate her mental health during the pandemic.

**Results:** 100 patients were included. The mean age was 51 years. The prevalence of anxiety and depression before the COVID-19 pandemic were 63% and 43% respectively. Under pandemic, the prevalence of anxiety was 77%: 25 women had mild anxiety, 29 moderate anxiety and 23 severe anxiety. For depression, the prevalence was 62%: 25 were experiencing mild anxiety, 20 moderate anxiety and 17 severe anxiety. The COVID-19 was significantly correlated with the increase of anxiety and depression rate (p=0.027 and p=0.005) respectively. Other clinical factors were significantly associated with the increase of the anxiety and depression. In multivariate Analysis including the incidence of anxiety and depression during the pandemic and these factors, COVID-19 was an independent factor affecting the incidence of anxiety and depression (p<0.05, IC=95%).

**Conclusions:** this study underlined the negative psychological impact of COVID-19 in breast cancer patient, showing the importance of the psychological support.

Introduction

The widespread contagion and lockdown of the COVID-19 pandemic have caused considerable mental health problems in the world such as anxiety, depression, and post-traumatic stress symptoms [1, 2]. This pandemic has had a harmful effect on the public mental health leading to psychological crises mainly due to the resulting uncertainty, public restrictions, physical distancing and its effects on our everyday life [3]. Previous research revealed an increased psychological burden during this pandemic, including distress, anxiety, and depression [4]. Therefore, early identification of individuals in the early stages of a psychological disorder makes the intervention strategies more effective.

Cancer patients are a vulnerable patient group due to the psychological burden of their chronic disease. In fact, cancer diagnosis and treatment can give rise to considerable mental health issues for individuals, and according to many studies, half of the patients with cancer suffer from acute psychological distress and mental health disorder, including anxiety and mood disorders [5].

Preliminary data of nationwide analysis in China demonstrated cancer as a risk factor for developing severe complications, disease course among COVID-19 patients [6]. Indeed,
additional cancer deaths may result from the direct effects of contracting COVID-19 infection, or the indirect effects of the pandemic on disruption of cancer treatment services and delays in diagnosis. The additive stress caused by the COVID19 outbreak, which may compound worrisome and ruminative thinking patterns, may predict worse outcomes for anxiety, depression and cognitive health in women affected by breast cancer, who already consistently indicate cognitive and emotional vulnerability. Special attention should be paid to psychological status of breast cancer patients especially those with poor general condition, treatment discontinuation, aggressive molecular subtypes and metastatic breast cancer.

The current study aimed to evaluate the impact of COVID-19 pandemic on anxiety and depression in Tunisian breast cancer patients.

**Materials And Methods**

**Design and sample**

Our study was carried out during the COVID-19 pandemic. The design was an observational, cross-sectional and evaluative study.

Patients were recruited from the outpatient sections of the Departments of Clinical Oncology of Salah Azaiez Institute. Eligibility criteria were: Tunisian women who were 18 years old or older, under treatment for breast cancer (stage I to IV breast cancer) and who have started treatment before the onset of the pandemic. They must have an evaluation of anxiety and depression with the HAD scale before the onset of the COVID infection. Patients who had a history of psychiatric disorder, or had metastatic brain disease were excluded from the study. Before answering the questionnaire, we informed the patients of the study's purpose. After inclusion, each patient was asked to complete the HAD scale to evaluate her mental health during the COVID-19 pandemic.

**Measurements**

**Data collection**

The study was performed between September and December 2020. The required ethical approval was obtained from the institutional review board of the hospital. Informed consent was obtained from the participants. The questionnaire was filled out and the confidentiality of the information and privacy of the participants were protected throughout the study.

The self-compiled demographic questionnaire (HADs) aimed to collect patients characteristics such as age, gender, marital status, monthly household income, educational level, and whether patients’ symptoms have improved.

The self-report Hospital Anxiety and Depression Scale [7] is a widely used scale that measures anxiety and depression experienced over the last seven days. The HADS consists of 14-items, seven relating to
anxiety symptomatology and seven relating to depression symptomatology. All items are measured on a four-point Likert scale from 0 to 3, with total scores ranging from 0 to 21 for each of the subsections. Higher scores indicating greater levels of anxiety and/or depression.

**Statistical analysis**

Statistical analyses were conducted with IBM SPSS Statistics version 25.0 (IBM). Descriptive data were presented as means and standard deviations, while categorical variables were described using frequency and percentage. Anxiety and depression were analysed as dependent variables. According to the scale instructions of HADS (we classified the scores of anxiety or depression dimension from 0–7 as normal group and classified the scores > 8 as the anxiety (subthreshold anxiety and major anxiety) or depression (subthreshold depression and major depression) group. The subscales of anxiety and depression were scored separately by summing the items and then classifying as follows: normal (0–7), possible (8–10) and confirmed (≥ 11) [8]. For a relevant analysis, both scales were split on moderate (11–14), severe (15–21) [8].

**Results**

One hundred patients with breast cancer were included in the study. The mean age was 51.6 years (range 29-82 years). About marital status, 49% were married, 19% divorced, 19% widowed and 13% were single. Eighty patients had children. Seventy-two patients (72%) were unemployed or retired. The clinical and demographic characteristics of the patients are presented in table 1.

The prevalence of anxiety before the COVID-19 pandemic was 63%. Thirty-nine had mild anxiety, 22 had moderate anxiety and 2 had severe anxiety. The prevalence of depression before the COVID-19 pandemic was 43%. Of those patients, 31% were experiencing mild depression, 9% moderate depression and 3% severe depression. The prevalence of anxiety under novel coronavirus pandemic in breast cancer patients was 77%. Twenty-five women had mild anxiety, 29 had moderate anxiety and 23 had severe anxiety. The prevalence of depression under novel coronavirus pandemic was 62%. Of those patients, 25 were experiencing mild depression, 20 moderate anxiety and 17 severe anxiety (table2). The incidence of anxiety and depression was 14% and 13% respectively.

Obviously, anxiety and depression score are considerable even before the onset of the COVID-19. For that, we aimed to demonstrate the impact of the pandemic on mental health by looking for correlations between the incidence (new cases) and the prevalence (the number of cases of anxiety and depression during the study period). Therefore, there was a correlation between the number of new patients suffering from anxiety or depression before the onset of the covid19, and the prevalence with (p = 0.027 and p = 0.005, respectively) (table 3).

Then, we deduced that the pandemic of COVID 19 was correlated with the increase of anxiety and depression rate, as acquired that the other factors are ever – present before and after the onset of the COVID 19.
Data analysis during covid-19 pandemic showed that a more advanced stage of cancer was related to an increased risk of depression ($P < 0.001$) and anxiety ($P < 0.001$) (stage III-IV compared to stage I-II). Women receiving palliative chemotherapy had a higher risk of depression ($p < 0.001$) and anxiety ($p = 0.001$). Asthenia and pain were also factors that increased the risk of depression ($p = 0.001$ and $p < 0.001$, respectively) as well as anxiety ($p = 0.008$ and $p < 0.001$, respectively). Moreover, unfavorable socioeconomic status, radical surgery (mastectomy) and neuropathy showed a higher risk of anxiety ($p = 0.006$, $p = 0.005$ and $p = 0.009$, respectively).

Other factors, such as lymphoedema and poor performance status of 2–3 were also associated with a higher risk of depression ($p = 0.009$ and $p = 0.022$, respectively). There were no significant relationships between depression or anxiety and place of residence, level of education, family support and professional status.

The Delay in care or treatment during the outbreak, is related to an increased risk of depression ($P < 0.001$) and anxiety ($P < 0.001$).

Finally, There was a statistically significant relation ($p < 0.05$) between different factors and anxiety, depression score before the onset of covid 19. (Table 4)

We aimed to prove that the onset of covid is an independent factor of anxiety and depression. Therefore, we applied Multivariate Statistical Analysis including the incidence of anxiety and depression during the pandemic and many factors already correlated to these troubles. We have found that the onset of covid-19 is an independent factor which can affect individually the incidence of anxiety and depression ($p < 0.05$, IC = 95%) (Table 5)

**Discussion**

A cancer diagnosis is a very stressful time in an individual's life. Experiencing a new cancer diagnosis amid a pandemic presents a new set of stressful life events. The current study investigated the impact of the COVID-19 pandemic on cognitive and emotional health in a group of women affected by primary breast cancer.

Women with a history of breast cancer appear to be at higher risk of a wide range of adverse mental health outcomes up to several years post diagnosis and treatment compared with women who did not have cancer [9]. This explains the high prevalence of anxiety and depression highlighted in the study even before the covid-19 pandemic. The findings of the presented study add to the evidence of a relation between increasing anxiety and depression during COVID-19 pandemic in BC patients. Our results are in line with those of Swainston et al [12] who found that COVID-19-related emotional vulnerability predicted higher levels of anxiety and depression in breast cancer patients.

Many studies investigated the effect of COVID-19 outbreak in chronic disease patients and indicates that somatization, anxiety and depression where increased. Chronic illness appears to be a significant factor
when it comes to the levels of depression and anxiety. In particular, individuals with a chronic disease appear to experience more symptoms of stress and anxiety than those who do not have a chronic disease, a difference that was significant among the women [10, 11]. Obviously primary BC may affect mental health during Covid-19 pandemic like any other chronic disease.

We identified factors affecting the BC patients during the COVID-19, which may help to make effective measure to reduce stress for these patients. Women receiving palliative chemotherapy and undergoing an advanced stage of breast cancer presented an increased risk of anxiety and depression. This is not always valid. Burgess et al [13] indicate that even women with early breast cancer, the prevalence of depression, anxiety, or both in the year after diagnosis is around twice that of the general female population. The risk factors for depression and anxiety are related to the patient rather than to disease or treatment.

Other clinical features such as lymphoedema, pain or a poor performance status are correlated with a higher risk of anxiety and depression before and after the covid-19 outbreak. Several researchers assert that many factors associated with psychological distress, including depression, in groups of patients with various cancers have included physical variables, such as pain, fatigue, other symptom burden, and poor performance status [14]. In a systematic review by Zaza and Bain [15], the authors found a strong association between pain and psychological distress in cancer patients.

Our findings don't report significant relationships between depression or anxiety and level of education, family support and professional status before or after the pandemic. This doesn't concern with some previous researches. A prospective study with a long-term follow-up for patients showed that family support was associated with both low levels of, and quick improvement from, depression [16]. Kamen et al. [17] showed that family support was related to less severe insomnia at baseline in BC patients. Additionally, one previous study demonstrated that family support could avoid or alleviate certain mood difficulties in BC patients in the Chinese population [18]. Therefore, people need to be educated regarding the importance of providing support for BC family members, especially during epidemic outbreaks. As known, Loneliness and social distancing are associated with higher risk of mortality in cancer patients [19, 20]. It also enhances patients feelings of uncertainty associated with their prognosis.

The significant psychological impact on oncological patients is compounded by multiple factors during the pandemic. The knowledge that the individual is at higher risk of serious complication if infected by Covid-19, loneliness and isolation as a result of social distancing, and the underlying constant fear of the cancer.

Many other factors may affect mental health of BC patients during the pandemic. Because of limited medical resources, a higher risk of infection with COVID-19, and the possibility of experiencing worse outcomes after infection, the BC patients had to delay or discontinue their planned anti-cancer treatments, increasing the psychological pressure on these individuals. Our study showed that patients who have experienced a delay in care, treatment or the postponement of Chemotherapy cures, during the outbreak, presented a higher rate of anxiety that other patients.
Moreover, within a vicious circle, emotional distress in women affected by breast cancer has been associated with reduced treatment compliance [21], which may influence disease progression and mortality [22].

There are some limitations of our study. There was a possible selection bias for the patients enrolled in this study. All patients were included at the day hospital and they are supposed to complete the questionnaire about their mental health before and after the pandemic at the same time. The changes in the psychological status of BC patients should be investigated at different periods of the pandemic. Second, the sample size of BC patients was small. Furthermore, our population was diverse and heterogeneous in terms of disease states, which limits the power to each relevant clinical subgroup.

**Conclusion**

This study has several implications for clinical practice. The psychological status of BC patients deserves more attention during COVID-19 pandemic. Effective measures should be taken to minimize mental health issues and to provide psychological support. It is important to raise awareness amongst health care professionals acting at various levels of the health care system of the increased risk of mental health symptoms among breast cancer survivors, in particular anxiety, depression. These data suggest that cancer patients are vulnerable toward experiencing significant psychological distress in the context of a pandemic and highlight the need to better support them during that time.

**Declarations**

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**Conflict of interest**: Authors have no conflicts of interest to declare that are relevant to the content of this article

**Availability of data**: The datasets generated during the current study are available from the corresponding author on reasonable request

**Author’s contributions**:

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All authors read and approved the final manuscript.

**Ethical approval**: Approval was obtained from the ethics committee of Salah Azaiez institute. The procedures used in this study adhere to the tenets of the declaration of Helsinki

**Consent to participate**: Informed consent was obtained from all individual participants included in the study

**Consent for publication**: all participants have consented to the submission of their cases to the journal

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**Tables**
### Table 1
Clinical and demographic characteristics of patients

| Variable                  | Number of patients |
|---------------------------|--------------------|
| Place of residence        |                    |
| Urban                     | 68                 |
| Rural                     | 32                 |
| Level of education        |                    |
| Illiterate                | 11                 |
| Primary school            | 23                 |
| Secondary school          | 42                 |
| University                | 24                 |
| Professional status       |                    |
| Active                    | 28                 |
| Inactive                  | 72                 |
| Family support            |                    |
| Yes                       | 86                 |
| No                        | 14                 |
| Socioeconomic status      |                    |
| Unfavorable               | 32                 |
| Favorable                 | 68                 |
| Smoking                   |                    |
| Yes                       | 15                 |
| No                        | 85                 |
| Alcohol                   |                    |
| Yes                       | 0                  |
| No                        | 100                |
| Physical activity         |                    |
| Yes                       | 23                 |
| No                        | 77                 |
| Performans status         |                    |
| 0–1                       | 74                 |
| 2–3                       | 26                 |
| Menopausal women          |                    |
| Yes                       | 57                 |
| No                        | 43                 |
| Cancer staging            |                    |
| Localized                 | 45                 |
| Advanced                  | 55                 |
| Type of surgery           |                    |
| Conservative              | 23                 |
| Radical                   | 58                 |
| Variable                  | Number of patients |
|--------------------------|--------------------|
| Type of chemotherapy    |                    |
| Curative                 | 66                 |
| Palliative               | 34                 |
| Radiotherapy             |                    |
| Yes                      | 55                 |
| No                       | 45                 |
| Hormone therapy          |                    |
| Yes                      | 33                 |
| No                       | 67                 |
| Scars                    |                    |
| Yes                      | 70                 |
| No                       | 30                 |
| Breast prosthesis        |                    |
| Yes                      | 4                  |
| No                       | 96                 |
| Lymphoedema              |                    |
| Yes                      | 25                 |
| No                       | 75                 |
| Asthenia                 |                    |
| Yes                      | 31                 |
| No                       | 69                 |
| Neuropathy               |                    |
| Yes                      | 25                 |
| No                       | 75                 |
| Pain                     |                    |
| Yes                      | 62                 |
| No                       | 38                 |
Table 2
Prevalence of Anxiety and Depression before and after COVID19

|                     | Before COVID19 | After COVID19 |
|---------------------|----------------|---------------|
| Anxiety             |                |               |
| mild                | 63%            | 77%           |
| moderate            | 39%            | 25%           |
| severe              | 22%            | 29%           |
| severe              | 2%             | 23%           |
| Depression          | 43%            | 63%           |
| mild                | 31%            | 25%           |
| moderate            | 9%             | 20%           |
| severe              | 3%             | 17%           |

Table 3
correlation between incidence and prevalence of anxiety and depression
(impact of the COVID 19)

| Incidence          | Prevalence | anxiety | Depression |
|--------------------|------------|---------|------------|
|                    |            | P = 0.027 | P = 0.005  |
Table 4

correlation with different factors and Anxiety and depression score (univariate analysis) during the Covid-19 pandemic.

| Factor                  | Anxiety   | Depression |
|-------------------------|-----------|------------|
| Unfavorable social status | P = 0.006 |            |
| Neuropathy              | P = 0.009 |            |
| Advanced stage          | P = 0.000 | P = 0.000  |
| Palliative CT           | P = 0.001 | P = 0.000  |
| Lymphedema              | P = 0.009 |            |
| Asthenia                | P = 0.008 | P = 0.001  |
| Pain (VAS > 6)          | P = 0.000 | P = 0.000  |
| PS (2–3)                | P = 0.022 |            |
| Conservative surgery    | P = 0.005 |            |
| Radical surgery         | P = 0.005 | P = 0.000  |

Table 5
multivariate analysis

| Incidence of anxiety | Incidence of depression |
|----------------------|-------------------------|
| p                    | OR                      | P          | OR          |
| neuropathy           | 0.083                   | 1.335      | 0.056       | 1.446       |
| Lymphoedema          | 0.023                   | 4.222      | 0.047       | 2.778       |
| pain                 | 0.012                   | 3.665      | ——          | ——          |
| Radical surgery      | ——                      | ——         | 0.036       | 0.659       |
| Ps = 2–3             | 0.037                   | 1.099      | 0.018       | 2.548       |