Depression and anxiety of cancer patients during coronavirus disease (COVID-19) pandemic

Magdalena Ciazynska (ciazynska.magdalena@gmail.com)
Department of Proliferative Diseases, Nicolaus Copernicus Multidisciplinary Centre for Oncology and Traumatology, Łódź, Poland https://orcid.org/0000-0002-9709-3383

Marta Pabianek
Department of Proliferative Diseases, Nicolaus Copernicus Multidisciplinary Centre for Oncology and Traumatology, Łódź, Poland

Katarzyna Szczepaniak
Department of Proliferative Diseases, Nicolaus Copernicus Multidisciplinary Centre for Oncology and Traumatology, Łódź, Poland

Małgorzata Skibińska
Department of Dermatology, Paediatric Dermatology and Oncology Clinic, Medical University of Łódź, Poland

Joanna Narbutt
Department of Dermatology, Paediatric Dermatology and Oncology Clinic, Medical University of Łódź, Poland

Aleksandra Lesiak
Department of Dermatology, Paediatric Dermatology and Oncology Clinic, Medical University of Łódź, Poland

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Abstract

Background: Coronavirus disease (COVID-19) pandemic seriously affects the mood, sleep and induce patients' stress in an oncological environment. To date there is no data available on cancer patients under the COVID-19 pandemic and its influence on anxiety and depression status.

Methods: A survey of 421 patients treated in an oncology center was conducted. The survey included Patient Health Questionnaire and the Generalized Anxiety Disorder Questionnaire to evaluate the influence of pandemic on the cancer patients' status of anxiety and depression.

Results: More than half of cancer patients (50.7%) during the COVID-19 pandemic had symptoms of anxiety, whereas the incidence of depression was 46.8%. Living alone contributes to a higher risk of depression (P=0.026) and anxiety (P=0.031). Moreover, patients having an acquaintance or a relative infected with COVID-19 were more susceptible to suffer severe anxiety (P=0.028).

Conclusions: Half of cancer patients are more likely to show increased incidence of depression and anxiety. There is a strong necessity to detect and treat depression and anxiety in cancer patients to increase the quality of life and reduce mortality. During this challenging time, the oncology community faces extraordinary issues to enhance the mental health for people with cancer.

Background

Keypoints / What this study adds

- We present an analysis of the most common clinical factors that cause an increase in anxiety and depression in cancer patients under COVID-19 pandemic.
- We determined the clinical and social characteristics predisposing to emotional distress and described the most vulnerable groups of patients in need of psychological intervention.
- Living alone contributes to a higher risk of depression and anxiety.
- Patients having an acquaintance or a relative infected with COVID-19 were more susceptible to suffer severe anxiety.

Depression remains an under-recognized comorbidity in cancer patients, with major implications on patient suffering decreased tolerance to chemotherapy [1], prolonged hospital stays [2] and higher mortality as well as healthcare expenditure. High levels of psychological tension for sustained periods in cancer patients could lead to depression and anxiety that compromise patients’ treatment outcomes resulting in higher mortality rates in cancer [3,4]. Unfortunately, depression and anxiety are often overlooked by cancer physicians in both palliative-care and non-palliative-care settings.

The rapidly expanding coronavirus disease 2019 (COVID-19) has impacted all aspects of daily life [5]. One of the major fears of most physicians, governments and patients is the heavy impact on the health care delivery systems. It is well established that COVID-19 can be particularly lethal in patients with cancer. Furthermore, in patients with cancer there is a potential for increased vulnerability to adverse outcomes from COVID-19 after oncologic treatments, because of the immunosuppressive state caused by both anticancer treatments as well as radiation therapy. As such, oncologists and patients must balance a potential delay in cancer treatment against the risk of potential COVID-19 infection. Many solid and hematologic cancers such as small cell lung cancer, pancreatic cancer or acute leukemia require immediate diagnosis and treatment. Additionally, there is a risk that oncology patients may not receive treatment on time, because people are encouraged to stay home to prevent the spread of the virus, the numbers of active medical personnel are reduced, and the economic crisis deepens. The impact on depression and anxiety status is considered important by physicians and patients and is closely related to progression of cancer.

This study aims to evaluate the depression status and anxiety of cancer patients during the COVID-19 pandemic. We determined the clinical and social characteristics predisposing to emotional distress and described the most vulnerable groups of patients in need of psychological intervention.

Material And Methods

Survey structure

A survey of patients in Nicolaus Copernicus Multidisciplinary Centre for Oncology and Traumatology, Poland was conducted during March and June 2020. The study comprised of 421 patients with stage III and IV of different types of cancer undergoing chemotherapy, of whom 365 (86.7%) completed the study. The study instrument included a designed questionnaire packet with questions about demographic data including place of residence, gender, and source of income. Patients were also asked about their cognitive and preventive behaviors regarding COVID-19 and the accessibility of medical support. Moreover, the patients responded to the self-reported depression severity questionnaire (Patient Health Questionnaire-9 – PHQ-9 score), anxiety disorder questionnaire (Generalized Anxiety Disorder-7 – GAD-7 score) [6].

The PHQ-9 is a nine-item validated depression severity questionnaire [7]. The nine items pertain to the Diagnostic and Statistical Manual of Mental Disorders 4th ed (DSM-IV) criteria. Each item is rated on a 4-point scale from 0 to 3 (0, never; 1, several days; 2, more than half the time; and 3, nearly every day). The total score of depression severity ranges from 0 to 27 (0-4: none, 5-9: mild, 10-14: moderate, 15-19: moderately severe, 20-27: severe).

The GAD-7 is a seven-item validated questionnaire used as a screening tool and severity measure for generalized anxiety disorder [8]. The GAD-7 assesses the most prominent diagnostic features of generalized anxiety disorder. Response categories are “never,” “several days,” “more than half the days,” and “nearly every day,” scored as 0, 1, 2, and 3, respectively. The total score of the GAD-7 ranges from 0 to 21. The severity of anxiety symptoms score is assessed as follows: 0–4: none, 5–9: mild, 10–14: moderate, 15–21: severe [9,10].

Written informed consent was obtained from the study participants after full explanation of the purpose and nature of the data collection and storage. This research met the ethics guidelines of the institution where the study was performed, including adherence to Polish legal requirements. The procedures of this study complied with the provisions of the Declaration of Helsinki regarding research on human participants. The study was approved by an institutional review board. Written informed consent was obtained from all subjects after receiving an explanation of the study.

Analysis

We analyzed both demographic data and the completion percentage by descriptive statistics. Both depression and anxiety have been analyzed using the Mann-Whitney test for two groups and the Kruskal-Wallis test to evaluate the differences between three or more independent samples. Two-sided p values of 0.05 or less were considered statistically significant.

Results

Demographic and clinical characteristics

Three hundred and sixty-five (365) cancer patients completed the survey questionnaire, 195 (53.4%) were female and 170 (46.6%) were male. Patients’ mean age was 64.91 ± 9.97 years. Majority of them (253 – 69.3%) were married and mainly living with family or a partner (293 – 80.3%). Seventy-two (19.7%) patients were living alone. Three hundred and twenty patients (87.7%) were unemployed or retired. More than half (223 – 61.1%) income fell below the national average, 23.0% patients’ income was close to national average and 15.9% patients’ income was above national average. Only eighteen patients (4.9%) had relatives or friends diagnosed with COVID-19. No one was asked to quarantine due to suspicion of

infection nor has been infected with COVID-19. Majority of patients (93.4%) were worried about the economic effects of the pandemic.

Depression and anxiety

Table 1 presents how the anxiety level and mental health of cancer patients was affected during the outbreak. Out of the 365 patients, less than half (49.3%) had no symptoms of anxiety, whereas the proportion of patients with mild, moderate, and severe anxiety were 31.8%, 16.2%, and 2.7%, respectively according to GAD-7 scores. The incidence of depression was 46.8% (171 patients), with 31.2% of assessed as mild, 13.7% moderate and 1.9% moderate to severe according to PHQ-9 scores. No severe cases of depression were observed in the study.

Table 1. Analysis of cancer patients' anxiety and depression level during pandemic period (n = 365).

riable	Normal		Anxiety level GAD-7						P value†	Normal		Depression level PHQ-9						P value†
			Mild		Moderate		Severe					Mild		Moderate		Moderate Severe		
r									0.008*									0.035*
nale	80	41%	66	34%	44	23%	5	3%		90	46%	61	31%	38	19%	6	3%	
le	100	59%	50	29%	15	9%	5	3%		104	61%	53	31%	12	7%	1	1%	
ears)									0.09									0.11
0	18	56%	9	28%	5	16%	0	0%		19	59%	9	28%	4	13%	0	0%	
59	26	43%	25	41%	9	15%	1	2%		27	44%	25	41%	7	11%	2	3%	
69	76	49%	48	31%	26	17%	5	3%		82	53%	48	31%	23	15%	2	1%	
0	60	51%	34	29%	19	16%	4	3%		66	56%	32	27%	16	14%	3	3%	
ional									0.48									0.81
nary	20	38%	21	40%	10	19%	1	2%		24	46%	19	37%	9	17%	0	0%	
h school	73	56%	32	24%	25	19%	1	1%		82	63%	26	20%	20	15%	3	2%	
ational	45	52%	26	30%	11	13%	4	5%		47	55%	28	33%	9	10%	2	2%	
duate																		
l above	42	44%	37	39%	13	14%	4	4%		41	43%	41	43%	12	13%	2	2%	
l status									0.011*									0.023*
gle	44	39%	36	32%	28	25%	4	4%		51	46%	34	30%	26	23%	1	1%	
rried	136	54%	80	32%	31	12%	6	2%		143	57%	80	32%	24	9%	6	2%	
ıg type									0.031*									0.026*
ependent	23	32%	27	38%	18	25%	4	6%		26	36%	27	38%	17	24%	2	3%	
ıred	157	54%	89	30%	41	14%	6	2%		168	57%	87	30%	33	11%	5	2%	
of																		
nce																		
er of																		
ants)									0.27									0.68
al	41	56%	21	29%	11	15%	0	0%		43	59%	19	26%	10	14%	1	1%	
0,000	32	48%	17	25%	16	24%	2	3%		35	52%	18	27%	13	19%	1	1%	
000-																		
	15	36%	17	40%	9	21%	1	2%		16	38%	16	38%	10	24%	0	0%	
000-																		
0	24	38%	21	33%	14	22%	4	6%		26	41%	23	37%	11	17%	3	5%	
00,000	68	57%	40	33%	9	8%	3	3%		74	62%	38	32%	6	5%	2	2%	
yment									0.93									0.28
employed	161	50%	97	30%	52	16%	10	3%		173	54%	97	30%	46	14%	4	1%	
ployed	19	42%	19	42%	7	16%	0	0%		21	47%	17	38%	4	9%	3	7%	
e									0.73									0.75
ow																		
average	119	53%	58	26%	41	18%	5	2%		128	57%	59	26%	33	15%	3	1%	
und the																		
rage	36	43%	34	40%	11	13%	3	4%		41	49%	31	37%	9	11%	3	4%	
re than																		
average	25	43%	24	41%	7	12%	2	3%		25	43%	24	41%	8	14%	1	2%	
on of									0.23									
(years)																		0.72
	122	53%	77	33%	25	11%	7	3%		127	55%	80	35%	19	8%	5	2%	
	43	46%	26	28%	22	24%	2	2%		50	54%	23	25%	20	22%	0	0%	
	15	37%	13	32%	12	29%	1	2%		17	41%	11	27%	11	27%	2	5%	
of cancer									0.017*									0.016*
ge III	74	48%	55	35%	25	16%	1	1%		80	52%	54	35%	19	12%	2	1%	
ge IV	106	50%	61	29%	34	16%	9	4%		114	54%	60	29%	31	15%	5	2%	
ve or																		
ntance																		
OVID-19									0.028*									0.49
	4	22%	5	28%	3	17%	6	33%		7	39%	8	44%	2	11%	1	6%	
	176	51%	111	32%	56	16%	4	1%		187	54%	106	31%	48	14%	6	2%	

†Mann-Whitney test for two groups; Kruskal-Wallis test for three or more groups;

PHQ-9, Patient Health Questionnaire-9 score; GAD-7, Generalized Anxiety Disorder-7 score

Statistical analysis revealed that gender was a significant factor in depression (P=0.035) and anxiety (P=0.008) with a female predominance. Moreover, the severity of anxiety and depression in females was also higher compared to males.

Living alone showed a higher risk of depression (P=0.026) and anxiety (P=0.031). Single marital status was also a factor that increased the risk of depression (P=0.026) as well as anxiety (P=0.011). The more advanced stage of cancer related to an increased risk of depression (P=0.016) and anxiety (P=0.017) (stage IV compared to stage III). Moreover, patients having an acquaintance or a relative infected with COVID-19 were more likely to be severely anxious (P=0.028), but do not show a higher risk for depression (P=0.497). Other factors, such as educational level, patients age, place of residence, employment status, income or duration of illness were not associated with depression or anxiety according to PHQ-9 and GAD-7 tests.

Discussion

Diagnosis of cancer and its treatment are life-changing events and are a source of considerable emotional and psychological stress. High levels of psychological tension for sustained periods in cancer patients could lead to depression linked with poorer quality of life that compromise patients' treatment outcomes resulting in higher mortality rates in cancer. According to a meta-analysis conducted during non-epidemiological conditions across fourteen countries in 10,071 cancer patients, 16.3% had diagnosis of clinical depression and 10% of anxiety disorders [11]. Furthermore, study performed in Poland before the COVID-19 pandemic in 180 patients with lung cancer indicated that anxiety was diagnosed in 67 patients (37.2%) and depression in 75 patients (41.7%) [12]. The findings of the presented study add to the evidence of a relation between increasing anxiety and depression during COVID-19 pandemic in cancer patients. Fear and anxiety about a COVID-19 disease and what could happen can be overwhelming and cause strong emotions in adults, especially suffering from chronic diseases. Epidemiological situation impacts mood, sleep, and stress of cancer patients which are all closely related to depression and anxiety.

Public health actions to reduce the spread of COVID-19, such as social distancing, limiting contact with family, make cancer patient feel isolated and lonely and can increase stress and mood. The results of this study indicated that cancer patient's anxiety, as well as depression regarding the pandemic, were associated with living alone, gender (female), and whether an acquaintance or a relative was infected with COVID-19 or has been quarantined. However, no significant difference regarding age group or number of inhabitants of the place of residence was found. This can be explained by the recent alignment of cultural, economic and educational resources between rural and urban places.

The results confirmed that female patients experienced higher level of stress and negative emotions due to the pandemic compared to males. Previous studies have indicated that gender is a significant factor, as in some cancer types, women were found to be two or even three times more likely to experience depression than males [7]. Living with spouse or family was another favorable factor mitigating anxiety. Previous studies have indicated that students living with their parents were less afraid of the COVID-19 pandemic [8]. Furthermore, prevalent higher rate of anxiety and depression were noticed mostly among marital status that were separated, widowed, divorce and single.

Having acquaintances or relatives being infected with COVID-19 was an independent risk factor in students' anxiety, as well as in cancer patients' anxiety in our study. It confirmed that all people despite of their age experienced negative emotional consequences of the pandemic. In our study we noticed a difference in terms of the level of depression or anxiety between palliative (stage IV) patients and patients treated with adjuvant therapy. It was confirmed in previous studies that cancer pain and metastases have also been connected with higher levels of depression [9].

Santini et al. [10] reported that social disconnection puts the older population at a greater risk of depression and anxiety. Consistent with this hypothesis, the COVID-19-related stressors, especially affected the daily-life of the elderly suffered from cancer. Among the respondents, as many as 77.2% of over 70 years of age experienced depression and 48.7% had anxiety disorders.

Moreover, the relative risk of depression and anxiety in patients with cancer and other comorbidities not exceeded that of patients who had only oncological disease, despite the fact that among cases of COVID-19, patients with any comorbidity have poorer clinical outcomes than those without.

Feeling depressed, loss of interest and sleep problems were the symptoms that were reported mainly by cancer patients, followed by concentration problems. The mean score differences between cancer patients during non-epidemiologic condition and the oncology population during COVID-19 pandemic were most pronounced for the items indicating sleep problems and concentration problems. As such, “classical” depression features like loss of energy was very similar in both analyzed groups [11,12]. Little interest or desire in performing extracurricular activities occurred in 48% of cancer patients. Despite having much more spare time due to restrictions imposed on the prohibition of movement and the ban on social gatherings this time cannot be spent on pleasure. 54% of participants especially the elderly had difficulty falling asleep or waking up early because of COVID-19. Our previous research suggests that rising economic losses and financial insecurity lead to deterioration of cancer patients’ quality of life [13]. The mental health burden of health problem as well as economic recession influence the patient’s daily life.

Conclusions

In conclusion, the incidence of depression, anxiety and psychological problems increased under the COVID-19 pandemic. Diagnosis of oncological disease is associated with high stress for patients, affecting their mood. The COVID-19-related stressors that included economic factors, effects on daily life, and treatment delays were positively associated with the level of depression and anxiety symptoms of cancer patients during the pandemic, whereas social support, living with the family was negatively correlated with their psychological problems. Having an acquaintance or a relative infected with COVID-19 or quarantined was a risk factor for anxiety.

Additionally, mental health of cancer patient is distinctly affected when faced with public health emergencies such as a pandemic and they do require attention, and support of the physicians, families and society. Early identification of anxiety and depression may influence therapeutic decision-making and may become a predictive factor in the treatment process. Support from family and community, or feeling connected, and having access to in-person or virtual counseling and therapy can help cancer patients particularly during a crisis like the COVID-19 pandemic. Therefore, we believe that psychological assessment in cancer patients is of essential clinical importance, especially during this extraordinary time.

Declarations

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Conflict of interest

None declared.

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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