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Research Article

Screening for Psychological Distress and Affective State among Cancer Patients in Minia

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Abstract

Background: Psychological distress is widespread in cancer patients as it is considered one of the traumatic events which significantly affect the quality of life of cancer patients.**:** To compare psychological disorders between cancer patients and a control group regarding the prevalence of associated mental health disorders and the level of positive and negative affect. The study also examines the association of affective states with mental health disorders. **Methods:** This case-control study comprised 400 participants; 200 cancer cases attending Minia Oncology Center age and sex-matched with 200 community-based controls during the period from November 2021 till November 2022. **Results:** As regards psychiatric disorders, moderate to severe depression, anxiety, and stress are significantly higher among cases (69%, 68%, and 52.5%) compared to controls (31%, 32%, and 47.5%) respectively. The overall negative affect mean score is significantly higher among cases (25.88±6.54) compared to the control group (19.74±1.78). There are significant positive correlations of the negative affect score with psychological disorders scores with stronger associations among cases compared to controls. **Conclusion:** Psychological disorders are more prevalent among cancer cases compared to the controls with significant associations of affective states with mental health disorders. **Recommendation**: Integrating psychological screening is recommended for cancer patients as a routine in cancer care and referral to a mental health professional for tailoring psychological counseling and supportive care services to meet their needs.

Keywords: Psychological disorders, Affective states, Cancer, Minia

Introduction

The cancer burden continues to grow globally. The global incidence is expected to increase by more than 80% from 2008 to 2030 with an increase predicted to occur in less-developed countries [1]. The imbalance of psychological well-being will result in mental illnesses that would ultimately end up with physical morbidities. Also, patients diagnosed with chronic physical morbidities such as cancer are at increased risk for different psychological problems [2]. Psychological problems in cancer patients are related to reactions to cancer diagnosis, treatment effects, recurrence, survivorship, psychological burden in addition to physical pain and the social impact of cancer [3].

Worldwide, the prevalence of depressive spectrum disorders is 3–5 times more prevalent among cancer patients than in the general population and ranges between 5% and 60% according to the different diagnostic criteria, the tools used in the studies, as well as the stage and type of cancer [4]. In Egypt,

psychological distress is common among cancer patients with almost half of those patients newly diagnosed with cancer reported significant distress [5].

Psychological disorders include anxiety, traumatic stress, and depression on one side and affective state on the other side. An individual exhibiting a combination of low mood, no interest or pleasure, guilt, low self-esteem, disturbed appetite, disturbed sleep, and disturbed concentration is called depressed. Moreover, the American Psychological Association defined anxiety as mixed feelings of tension, worried thoughts, and physical changes associated with autonomic arousal and skeletal muscle tension whereas stress is more associated with irritability, impatience, and difficulty relaxation [6].

Affective state includes positive affect (PA) and negative affect (NA) which are separate axes of psychological well-being and related to personality characteristics. Feeling of energy, enthusiasm, and positive mood states are considered a PA which reflects the extent to which a person experiences positive emotions and adaptive coping strategies. On the other hand, NA encompasses negative mood states such as nervousness, anger, sadness, and guilt. It indicates the presence of negative emotions and is often linked to psychological distress and maladaptive coping strategies [7]. There is an association of PA and NA with mental disorders such as anxiety and depression that can interfere with the ability to adapt to the stress of life-threatening illnesses [8].

Psychological disorders have a significant impact on various aspects of cancer patients' psychological and physical health outcomes by negatively influencing treatment compliance and dissatisfaction with overall care, disease progression, poorer quality of life, and even poorer survival rates [9]. Psychological distress should be measured as the 6th vital sign after temperature, blood pressure, pulse, respiratory rate, and pain [10]. Mental health is a key to cancer survivorship and there is a vital need to consider its impacts throughout the entire cancer journey thus, psychological well-being is considered to be an essential component of not just mental health, but overall health [11].

In light of these above concerns, the objectives of this study are to compare psychological disorders for cancer patients and the control group regarding the prevalence of associated mental health disorders and the level of positive and negative affect and to examine the association of affective states with mental health disorders.

Patients and Methods:

Study design:

This case-control study was conducted in Minia Oncology Center, Minia, Egypt.

Study population:

The study sample comprised 400 participants; 200 cancer cases age and sex-matched with 200 healthy community-based controls were recruited after screening for eligibility criteria; inclusion criteria included males or females >18 years of age, diagnosed with cancer of any type from 3 months or more in Minia Oncology Center and patients who were clinically stable while cases with previously diagnosed psychiatric disorder and/or documented diagnosis of cancer of any type less than 3 months were excluded. Healthy individuals free from cancer, age, and sex-matched with cases were enrolled as the control group. Individuals who were relatives of cases, with a positive family history of any type of cancer, and/or were previously diagnosed with a psychological disorder were excluded.

Data were collected after explaining the nature and aim of the study and obtaining verbal consent from both groups during the period from November 2021 to November 2022. It was collected by a standardized validated questionnaire which included demographic data, clinical data, the Depression Anxiety Stress Scale-21, and the Positive and Negative Affect Schedule.

The Depression Anxiety Stress Scale-21 (DASS-21) was used to assess mental health. It included 21 questions to measure anxiety, stress, and depression separately where each scale had 7 questions. Scores for depression, anxiety and stress were calculated by adding the scores for the relevant items; depression scale (items 3,5,10,13,16,17,21), anxiety scale (items 2,4,7,9,15,19,20), and stress scale (items 1,6,8,11,12,14,18). The overall score ranged from 0 to 21. Scores (0–4), (0–3), and (0–7) showed normal levels of depression, anxiety, and stress respectively while scores (5–6), (4–5), and (8–9) showed mild levels of

depression, anxiety, and stress respectively, scores of (7– 10), (6–7) and (10–12) showed moderate levels of depression, anxiety, and stress respectively but scores above (11), (8) and (13) showed severe and extreme severe levels of depression, anxiety, and stress respectively [12].

The Positive and Negative Affect Schedule (PANAS) was used to measure positive and negative affect. PA reflects the extent to which a person feels active, alert, and enthusiastic. In contrast, NA reflected negative mood states including nervousness, anger, sadness, and guilt. These scales had shown to be largely uncorrelated. Both scales consisted of 10 items. Patients were asked to rate the extent to which they had experienced each mood during the past week. Items were scored on a 5-point Likert scale, ranging from 1 (not at all) to 5 (very much). Scores could be obtained by adding up the ten items, with higher scores reflecting higher positive or negative affect (scale range 10–50) [13].

Ethical consideration:

Ethical permission was taken by the research ethical committee of the Faculty of Medicine in Minia University (ethical approval number 88-2021). Formal acceptance was obtained from the scientific ethical committee and the director of Minia Oncology Center. Verbal consent was obtained from all participants after providing comprehensive information about the aim and the nature of the study. The issues of privacy and confidentiality of all study participants were considered.

Data statistical analysis:

The collected data were computerized and statistically using the Statistical Package of Social Science (SPSS), version 20. The Kolmogorov-Smirnov test was used to determine the distribution characteristics of continuous variables.

Results were expressed as mean ± SD for normally continuous variables while frequencies (percentages) for categorical variables.

Comparisons between the means of continuous variables for two groups were performed using the unpaired Student's t-test. Categorical variables were compared by Chi-square or Fisher's exact test "if >20% of cells had expected count less than 5". Spearman correlation was used for the analysis of correlations for continuous variables not normally distributed. The P value of less than 0.05 was used as a cut-off point for all significant tests and all statistical tests were 2-tailed.

Results:

As shown in Table (1), the mean age for cases and controls is 41.98 ± 13.41 and 41.48 ± 10.44 respectively. Additionally, almost half of each group are females and reside in rural areas. The majority of cases and controls are married. The education level in cases is significantly lower compared to the control group (p-value < 0.0001).

Table 2 shows that about half of the studied cancer patients are diagnosed with cancer for more than one year or in advanced cancer stage (stage III or more). Regarding cancer therapy, 51% of cases received chemotherapy followed by 20% undergoing chemoradiotherapy.

Figure (1) shows that the most common cancers among the studied cases are breast cancer (28.5%) followed by colon cancer (20.5%) and liver cancer (9.0%) while the least common cancers are lung cancer (2.5%) followed by pancreatic and thyroid cancers (4.5%).

Table (3) shows that moderate to severe depression, anxiety and stress are significantly higher among cases (69%, 68% and 52.5%) compared to controls (31%, 32%, and 47.5%) respectively (p value<0.0001).

Table (4) shows that 55.9% of cancer cases receiving chemotherapy are associated with moderate depression while 60.8% and 50% of those receiving chemotherapy and radiotherapy are associated with moderate anxiety respectively. Moreover, 73.3% of those who undergo surgery are associated with moderate stress. On the other hand, severe forms of psychiatric disorders are higher among those receiving combined therapy than other types of cancer therapies.

Table (5) shows that the overall PA score is statistically significantly lower in cases with a mean of 21.30 ± 7.56 in comparison to the

control group while the NA score is a significantly higher mean in cases (25.88 ± 6.54) compared to the control group (p value < 0.0001).

Table (6) shows a significant negative correlation of PA score with psychological disorders scores. On the other hand, NA score has significant positive association with psychological disorders scores. Among cancer cases, the correlations of affective states scores are strong with depression but moderate with anxiety and stress scores while among the control group strong correlation of PA was found with stress. Psychological disorders scores are highly correlated with NA among cases compared to controls.

Table (1): Demographic and baseline characteristics of the study participants, Minia, Egypt, 2021-2022

Characteristics	Cases groups (n=200) N (%)	Control groups (n=200) N (%)	P value
Age (years)			
Mean ± SD	41.98 ± 13.41	41.48 ± 10.44	0.67
Range	23 - 72	24 - 69	
Sex			
Male	86 (43.0%)	95 (47.5%)	
Female	114 (57.0%)	105 (52.5%)	0.37
Residence			
Urban	97 (48.5%)	91 (45.5%)	0.55
Rural	103 (51.5%)	109 (54.5%)	
Marital Status			
Single	18 (9.0%)	16 (8.0 %)	
Married	145 (72.5%)	156 (78.0 %)	0.6
Divorced	29 (14.5%)	21 (10.5 %)	
Widow	8 (4.0%)	7 (3.5 %)	
Education			
Illiterate	33 (16.5%)	9 (4.5 %)	
Read and write	33 (16.5 %)	25 (12.5 %)	<0.0001*
Secondary	68 (34.0 %)	84 (42.0 %)	
University and above	66 (33.0 %)	82 (41.0 %)	
Occupation			
Non-worker	75 (37.5%)	66 (33.0%)	
Craftsman	16 (8.0%)	11 (5.5%)	0.16
Technician	29 (14.5%)	48 (24.0%)	
Clerk	59 (29.5%)	53 (26.5%)	
Professional	21 (10.5%)	22 (11.0%)	

*Statistically significant

Table (2): Clinical data findings among the studied cancer patients, Minia Oncology Center, 2021-2022

	Cancer patients (n=200) N (%)
Time since diagnosis	
3-6 month	50 (25.0%)
6-12 month	40 (20.0%)
>12 month	110 (55.0%)
Cancer Stage	
Stage I	11 (5.5%)
Stage II	86 (43.0%)
Stage III or more	103 (51.5%)
Cancer therapy	
Chemotherapy	102 (51.0%)
Radiotherapy	12 (6.0%)
Chemoradiotherapy	40 (20.0%)
Surgery	15 (7.5%)
Combined	31 (15.5%)

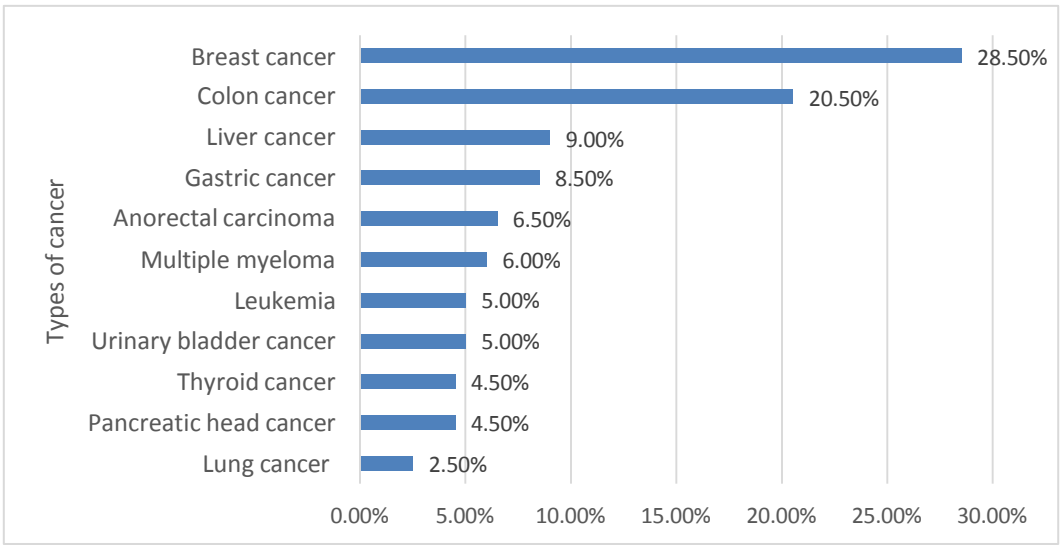

Figure (1): Frequency distribution of cancer types among the studied cancer patients, Minia Oncology Center, 2021-2022

Table (3): Comparison of psychiatric disorders for the studied participants regarding the Depression Anxiety Stress Scale-21, Minia, Egypt, 2021-2022

	Case groups (n=200) N (%)	Control groups (n=200) N (%)	P value
Depression scale			
Normal to mild	62 (31%)	158 (79%)	<0.0001*
Moderate to severe	138 (69%)	42 (21%)	
Anxiety scale			
Normal to mild	64 (32%)	147 (73.5%)	<0.0001*
Moderate to severe	136 (68%)	53 (26.5%)	
Stress scale			
Normal to mild	95 (47.5%)	182 (91.0%)	<0.0001*
Moderate to severe	105 (52.5%)	18 (9%)	

*Statistically significant

Table (4): Frequency distribution of depression, anxiety, and stress in different cancer therapies among the studied cancer patients, Minia Oncology Center, 2021-2022

	Anti-tumor therapy (n= 200) N (%)				
	Chemotherapy (n=102)	**Radiotherapy** (n=12)	**Chemoradiotherapy** (n=40)	**Surgery** (n=15)	**Combined therapy** (n=31)
Grades of depression					
Normal	7 (6.9%)	3 (25.0%)	11 (27.5%)	2 (13.3%)	4 (12.9%)
Mild	11 (10.8%)	0 (0%)	14 (35.0%)	5 (33.3%)	5 (16.1%)
Moderate	57 (55.9%)	5 (41.7%)	9 (22.5%)	7 (46.7%)	11 (35.5%)
Severe/ extremely severe	27 (26.5%)	4 (33.3%)	6 (15.0%)	1 (6.7%)	11 (35.5%)
Grades of anxiety					
Normal	8 (7.8%)	0 (0%)	6 (15.0%)	0 (0%)	2 (6.5%)
Mild	13 (12.7%)	2 (16.7%)	21 (52.5%)	7 (46.7%)	5 (16.1%)
Moderate	62 (60.8%)	6 (50.0%)	7 (17.5%)	7 (46.7%)	11 (35.5%)
Severe/ extremely severe	19 (18.6%)	4 (33.3%)	6 (15.0%)	1 (6.7%)	13 (41.9%)
Grades of stress					
Normal	22 (21.6%)	3 (25.0%)	13 (32.5%)	4 (26.7%)	5 (16.1%)
Mild	27 (26.5%)	2 (16.7%)	12 (30.0%)	0 (0%)	7 (22.6%)
Moderate	48 (47.1%)	3 (25.0%)	12 (30.0%)	11(73.3%)	6 (19.4%)
Severe/ extremely severe	5 (4.9%)	4 (33.3%)	3 (7.5%)	0 (0%)	13 (41.9%)

Table (5): Comparison of positive affect (PA) and negative affect (NA) scores between the studied groups, Minia, Egypt, 2021-2022

	Case groups (n=200)	Control groups (n=200)	P value
PA score			
Mean ± SD	21.30 ± 7.56	26.38 ± 7.24	<0.0001*
Range	(10 – 34)	(10 – 34)	
NA score			
Mean ± SD	25.88 ± 6.54	19.74± 1.78	<0.0001*
Range	(17 – 36)	(17 – 24)	

- *Statistically significant

Table (6): Correlation analysis between Affective states and psychiatric disorders among the studied cancer cases, Minia Oncology Center, 2021-2022

Psychiatric disorders	Cases group (n=200)				Control group (n=200)			
	PA score		NA score		PA score		NA score	
	R	P value	R	P value	R	P value	R	P value
Depression score	-0.78	<0.0001*	0.77	<0.0001*	-0.63	<0.0001*	0.21	0.003*
Anxiety score	-0.68	<0.0001*	0.65	<0.0001*	-0.57	<0.0001*	0.27	<0.0001*
Stress score	-0.61	<0.0001*	0.64	<0.0001*	-0.77	<0.0001*	0.31	<0.0001*

*Statistically significant.

Discussion

The current study was a case-control study conducted in Minia Oncology Center, Minia, Egypt to compare psychological disorders between cancer patients and the control group and to examine the association of affective states with mental health disorders.

In the present study, almost half of cancer patients were females, and about two-thirds had a higher education level **(Table 1).** These findings were approximate to a study of marital adjustment among 130 cancer patients at the oncology division of the Jaen University Hospital in Spain which reported that 52.3% were females, 27.7% and 22.3% had higher education level secondary and university respectively [14].

Regarding clinical data findings in this study, 51% of cancer patients received chemotherapy **(Table2).** This corresponded to a previous cross-sectional study that demonstrated that 61.4% of breast cancer cases received chemotherapy in Tehran, Iran [15]and another study done on 521 young patients with cancer (aged 18–45 years) showed 80% of cases received chemotherapy [16]. Moreover, about 51.5% of the current cancer cases were diagnosed at advanced stage **(Table 2).** This was nearly similar to the study conducted on 176 participants who attended surgery centers at the Oncology Department of the University Hospital of Palermo that showed that cancer patients at advanced stage represent 22.7% at stage III and 20.2% at stage IV [17].

It was observed in the current study that the most common cancers among the studied cases were breast cancer (28.5%) followed by colon cancer (20.5%) while the least common cancer was lung cancer (2.5%) **(Figure1)**. This was

in line with a previous study that assessed the association of marital adjustment with psychological disorders in Spain and found that the most common cancers were breast cancer (25.4%) followed by colon cancer (23.9%), [14] while the least common cancer was lung cancer (1%) in the study done on young cancer patients [16] and this could be explained by almost half of the cases were females. In disagreement with these findings, it was found in a previous study done on 350 patients with incurable cancer that the most common cancer was lung cancer (54.6%) [18].

Regarding psychiatric disorders in the present study, moderate to severe depression, anxiety and stress are significantly higher among cases (69%, 68%, and 52.5% respectively) compared to control (p value<0.0001) **(Table 3).** These observations were nearly similar to a previous case-control study that reported that 60% and 62% of cancer patients suffer from depression and anxiety respectively which were significantly higher than 28% for both among the control group [19]**.** Moreover, a recent review reported higher depression and anxiety among cancer patients compared to the general population [3]**.** Additionally, a case-control study was conducted at oncology departments of a tertiary care center in Malwa region of Punjab study revealed that the percentage of depression, anxiety and stress as per the DASS-21 scale was 90, 56, and 28% among 300 cancer patient which higher compared to 300 matched controls [20]. Moreover, another study that included 120 breast cancer and 120 control women in China reported that the extent of elevated perceived stress in women with breast cancer was more than twice compared to healthy women [21].

These differences regarding psychiatric disorders were explained by cancer patients had major concerns about fear of cancer progression, its recurrence, uncertainty and fear of death thus, difficult to maintain hope leading to increase susceptibility to anxiety and depressive disorders in addition to the general population were almost to be found in the positive environmental area with higher positive feelings [22].

In the present study, 55.9% of cases received chemotherapy followed by 46.7% surgery were associated with moderate depression **(Table 4).** This was similar to a study done on recently diagnosed cancer cases in Iran found that breast and colon cancer patients had the highest prevalence of anxiety and depression. Among those who received chemotherapy as the single treatment, a higher prevalence of depression and anxiety was observed in 66.7% and 77.8% respectively. This could be explained by the side effects of chemotherapy, such as fatigue, pain, nausea, and changes in physical appearance. Moreover, chemotherapy drugs disrupt the normal functioning of neurotransmitters that regulate mood and emotions [23].

Among cancer patients in this study, the overall PA mean score was significantly lower than the control group while the NA mean score was significantly higher as compared to the control group (p-value <0.0001) **(Table 5).** Nearly similar to this, the PA score among the advanced cancer patients was lower than those of the general population. However, the NA score was nearly similar to the score in the general population according to the PANAS scale [24]. This could be attributed to cancer patients experiencing higher levels of psychological distress such as depression or anxiety that was associated with elevated NA and reduced PA.

These findings regarding the affect state in this study were against results from a cross-sectional study done on 105 advanced cancer patients showed that higher PA mean and lower NA mean [25]. In another cross-sectional study focused on cancer patients' reports of positive and negative psychological changes due to the illness 108 patients found that higher PA mean and lower NA mean **[7].** These could be explained by when cancer developed at an advanced stage and death was nearing, patients had to adapt and thus decrease negative feelings.

In the current study, negative significant correlation of PA score with depression, anxiety, and stress scores while the NA score had a significantly positive association with depression, anxiety, and stress scales **(Table 6).** This was similar to a previous study that reported that greater experience of positive psychiatric changes was significantly positively related only to more positive affect (r = 0.35) and not to negative affect (r = -0.15). More negative psychiatric changes were significantly related to more negative affect (r = 0.53) and less positive affect (r = - 0.42) **[7].**Furthermore, another study done on advanced cancer cases found that negative

significant correlation of PA score with depression, and anxiety (r=-0.62 and -0.38) while NA score was a significantly positive association with depression, and anxiety (r= 0.48 and 0.72) respectively **[25].**This could be explained by individuals with depression and anxiety often reporting a reduced capacity to experience positive emotions and derive pleasure from activities they previously enjoyed.

Conclusion

Psychological disorders and NA scores are significantly higher in cases compared to controls while PA scores are significantly lower among cases compared to controls. Additionally, there is significant association of affective states with mental health disorders and psychological disorders scores are more strongly correlated with NA among cases compared to controls.

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