

Clinical Parameters of Cancer Patients and their Relation with Depression Level

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Abstract:

Background: Clinical parameters of cancer patients as stage of cancer, duration of illness, type of treatment and medical history act as important risk factors for developing depression among cancer patients. **Aim of the study:** was to investigate the relation between clinical parameters of cancer patients and depression level. **Subjects and methods:** **Research design:** A descriptive correlational design was utilized in the current study. **Setting:** The study was conducted at 3 oncology out-patient clinics "the hematology clinic, Internal medicine tumor clinic and oncology and nuclear Medicine Clinic" at Zagazig University Hospitals. **Subjects:** A purposive sampling technique of 513 cancer ill patients. **Tools of data collection:** Two tools were used for data collection. **Tool (I):** Socio-demographic data sheet. **Tool (II):** Beck Depression Inventory (BDI-II). **Results:** The study revealed that more than two third of the studied patients had minimal depression level, more than one fifth had mild depression and less than one tenth of patients had moderate depression. there were significant relations between depression level and patients' clinical parameters namely presence of hypertension, duration of cancer suffering, cancer stage, treatment. **Conclusion** Cancer patients are more likely to develop depression as a common consequence that affects the treatment process of cancer. There was significant relation between depression level and the following clinical parameters of studied cancer patients; present of hypertension, had cancer duration more than three years, fourth stage and oral chemotherapy treatment. **Recommendations:** Psychiatric and medical follow-up for clinical parameters as (hypertension or any comorbid-cancer stage- effect of treatment) for patients who suffer from cancer. Special attention should be given to cancer patients regarding duration, stage and treatment.

Keywords: Clinical Parameters, Cancer, Depression.

Introduction:

The survival rates of cancer patients in underdeveloped nations are typically one-third of those in affluent countries. Each year, 9 million new cancer cases are diagnosed, including 4 million in affluent nations and 5 million in developing ones. Cancer will be one of the top causes of morbidity worldwide in the next decades²

Depression is a frequent acute and late comorbidity of cancer. Estimates of the prevalence of depression throughout the first five years after diagnosis range from 4% to 16%. In addition to displaying the

symptoms of depression, cancer patients who are depressed have lower treatment adherence and even worse survival rates than cancer patients who are not sad. It is well established that the likelihood that cancer patients may experience depression varies greatly depending on the type of cancer they have³. Depression, which is characterized by a lack of interest, melancholy, and depressed mood symptoms, is one of the most common illnesses worldwide, accounting for 5.9% of total disability-adjusted life years. It is a condition that causes a significant economic, familial, communal, and welfare burden, and it ranks 15th in terms of public health spending. Depressive symptoms are estimated

to afflict 350 million individuals globally, across all age categories⁴.

The progress of depression in cancer patients is likely to be influenced by clinical parameters like pain, stage of disease, stage of treatment, medical history and social support. Poor treatment adherence and an even worse survival have been linked to medical costs and access, as well as access to welfare benefits such as disability benefits⁵.

Moreover, depression is a significant medical condition that has far-reaching implications for cancer treatment. After adjusting for histopathological grade, number of positive lymph nodes, tumor size, kind of operation undergone, chemotherapy and/or endocrine treatment, estrogen-receptor status, and age, higher symptoms of depression have been linked to a worse 5-year likelihood of survival among cancer patients. Patients with heightened depressed symptoms had a higher chance of death, regardless of disease stage or whether depression was measured before or after the cancer diagnosis⁶.

Significance of the study:

Nowadays, cancer is one of the world's most serious public health issues and the second leading cause of death. When a person is diagnosed with cancer, they are more likely to experience adverse mental health outcomes such as depression. Depression is the most prevalent and debilitating neuropsychiatric disorder caused by physical illnesses like cancer. With a prevalence ranging from 9.4% to 66.1%, with an overall prevalence of 29.9%. Depression is a psychological and physiological disturbance characterized by a set of physical, emotional, and behavioral elements. So the study aimed to investigate the relation between clinical parameters of cancer patients and depression level.

Aim of the study:

The aim of the study was:

To investigate the relation between clinical parameters of cancer patients and depression level.

Research questions:

- 1- What are the clinical parameters of cancer patients?
- 2- What is the level of depression among cancer patients?
- 3- Is there a relation between clinical parameters of cancer patients and depression level?

Subjects and methods:

Research design:

A descriptive correlational design was utilized in the current study.

Study setting:

The study was conducted at 3 oncology out-patient clinics "the hematology clinic, Internal medicine tumor clinic and oncology and nuclear Medicine Clinic" at Zagazig University Hospitals.

Study subjects:

A purposive sampling technique of 513 cancer ill patients who met the following **inclusion criteria**; Age from 18 years and above, all cancer types and grades. **Exclusion criteria**; patients in coma, having mental disorders and patients who refused to share in this study.

Tools for data collection:

In order to achieve the objectives of the present study two tools were used to fulfill necessary data.

Tool1: Socio-demographic and clinical data sheet: this tool was designed by the researcher to assess the personal characteristics of cancer patients as age, sex, education level, marital status, religion, medical

history of patients, cancer stage ,duration and treatment.

Tool 2: Beck Depression Inventory (BDI-II): This scale was designed to assess the presence and severity of symptoms of depression. Beck Depression Inventory entails 21 items. Every item was valued on a 4-point scale varying from 0 to 3. The highest overall score is 63.

The scoring system; (0-13) reflects minimal depression, (14-19) mild depression, (20-28) moderate depression and (29-63) severe depression.

Validity & Reliability:

Through the distribution of the three tools along with a covering letter and explanation sheet outlining the goal of the study, the tool was revised by a five-person expert panel. At Zagazig University, there is one assistant professor of psychiatric and mental health nursing, two professors of psychiatry medicine, a professor of psychology at the faculty of arts, and a professor of mental health at the faculty of education. The study tools were obtained in Arabic language and reviewed the tools and ascertained clarity, relevance, comprehensiveness, and understandability. The reliability of BDI was assessed by Cronbach's Alpha that was used to measure the internal consistency was 0.714 for depression.

Field work:

The tools were collected during COVID- 19, the researcher followed the precautionary measures as (wearing mask and keeping distance). Once permission was granted, the researcher met with cancer ill patients undergoing chemotherapy and radiotherapy at (hematology clinic, Internal medicine tumor clinic and oncology and nuclear Medicine Clinic) who fulfilled the inclusion criteria. The researcher begun collection from heart and chest

building then went to outpatient clinic in the morning shift, three hub hazard days per week to collect data from different patients and to meet them. The patients were interviewed on individual bases for about 15:20 minutes .The researcher contacted with the patients by introducing herself and explained the nature and purpose of the study to obtaining patient's informed consent.

All questions answer and explanation were given to the patients to obtain acceptance and cooperation during interview session. The following steps were followed to collect the data by using tools sheet; socio demographic sheet, Beck depression inventory BDI. From pilot study results, it founded that average time needed to fill all data sheets was 15-20 mints. Socio demographic sheet 5 -10 minutes, BDI 10-15 minutes. The tools data was distributed to patients before receiving chemotherapy or radiotherapy session. The average number of completed tools daily ranged from 7-9 sheets. Data collection time continued for 6 months from the beginning of September 2020 to the end of February 2021.

Pilot study:

A pilot study was conducted on 51 cancer patients at oncology Outpatients clinic. Constituting about 10% of the total study sample. The purpose was to test the feasibility and clarity of the tools and estimate the time needed. The data obtained from the pilot was analyzed. The time needed to fill out the tools was about 40-45 minutes. The pilot sample was included in the main study sample since no modification was needed in the data collection form.

Administrative and Ethical consideration:

An official permissions obtained from dean faculty of nursing as well as the dean faculty of medicine Zagazig University to carry out the study.The ethical issues:-The study was accepted by the pertinent

authority of the research ethics commission the faculty of nursing at Zagazig University with code M.DZU.NUR/107/14/4/2020. Patients were given a verbal explanation of the aim of the study, its probable benefits, and methods of data collection to obtain the patients' trust in the study.

-Oral consent was taken from each patient to participate in the study. Patients were notified that participation was voluntary the right to withdraw was permissible. The tools did not include any injuries or distress, or any religious or traditional issues during the study sample. Confidentiality was confirmed throughout the study process and the patients were reassured that all data was handled only for research purposes.

Statistical analysis:

All data were gathered, tabulated and statistically analyzed using SPSS 20.0 for windows (SPSS Inc., Chicago, IL, USA 2011). Quantitative data were expressed as a mean \pm SD and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Percent of categorical variables were compared using Chi-square test. Pearson's correlation coefficient was calculated to assess relationship between various study variables. All tests were two sided. P-value < 0.05 was considered significant (S). The logistic regression is a predictive analysis. Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables.

Results:

Table (1): reveals that 41.3% of patients aged between 38 to 57 years, 58.5% of the studied sample were females, 40.4% of patients were enrolled on secondary school, 64.3% of patients were married, 49.1% of patients were housewives and 85.5% of them were Muslim patients.

Table (2): demonstrates that 25.8% of patients had gastrointestinal cancer and least percent of cancer manifest as eye and neurological cancer (1.5%) for each.

Table (3): reveals that 43.3% of cancer patients complaint from hypertension, 73.5% of them were affected in one system of body while 28.1% suffering from cancer from > 6 months to 1 year. The same table also reveals that 46.8% of patients were at second stage. 51.7% were treated by intravenous chemotherapy and 93% were treated by one line of treatment.

Figure (1) shows that 69.6% of the studied patients had minimal depression level, 22% of them had mild depression & only (8.4%) of patients had moderate depression.

Table (4) reveals that there was a significant relation between depression level and the following clinical parameters of the studied cancer patients: present hypertension $P = 0.02$, duration of cancer suffering $p = 0.014$, cancer stage $p = 0.0001$, treatment $p = 0.006$. It was clear that many of the clinical parameters of the studied cancer patients were associated with depression level. While **(20.7%)** of cancer patients who had hypertension suffered from moderate depression, **(15.1%)** of those who had cancer for more than three years suffered from moderate depression, **(27.8%)** of those in the fourth stage of cancer suffered from moderate depression, and **(37.5%)** of those treated by oral chemotherapy suffered from moderate depression.

Table (5): shows that significant predictors for mild depression in cancer patients were being divorced patients. They are more susceptible to have mild depression 5.679 times, followed by widowed 3.965 times than single patients. Fourth stage 8.602 times than first stage patients and third stage of cancer patients are more susceptible to have mild depression 2.196.

Table(6): shows that there was significant predictors for moderate depression in cancer patients. Fourth stage 17.345 times than first stage patients and third stage of cancer patients more susceptible to have moderate depression 3.575. Cancer patients treated via oral chemotherapy more susceptible to have moderate depression 5.375, times than intravenous chemotherapy patients.

Discussion:

Depression is a common ailment among cancer patients, affecting their capacity to cope with the disease, limiting treatment acceptance, lengthening hospitalization, and lowering quality of life. As a result, depression is a factor that contributes to an increase in the suicide incidence among cancer patients⁽¹⁾

In the present study results revealed that, depression level among the studied cancer patients was classified as : more than two thirds of them had minimal depression level, more than one fifth of patients had mild depression level and less than one tenth of them had moderate depression level. This finding might be due to that cancer itself causes psychological problems for patients, the most common of which is depression. And that the cancer patients think that his end is near. The side effects of treatment that cause physical problems for patients. In addition , the complications of procedures and routines to obtain treatment, which causes effort on patients and dissatisfaction. Further, higher rate of depression were reported among female patients with cancer ⁽⁷⁾.

On the other hand, **Abdalla et al⁽⁸⁾** stated that , more than one third of cancer patients had mild depression level, more than one tenth of cancer patients had moderate depression level and less than one

fifth of cancer patients had sever depression level.

Regarding relation between clinical parameters and depression level, the results of the present study reported that there was a significant relation between depression level and medical history of patients with hypertension as more than one fifth of cancer patients who had hypertension suffered from moderate depression. This discovery might be attributable to the fact that patients have a variety of comorbid diseases, which could contribute to the greater occurrence of depression and serve as a predictor of survival and resource needs. Another factor might be that some patients have trouble asking for aid and communicating with others. Furthermore, excessive medical costs and family financial issues may be sources of psychological anguish.

This findings was agree with, **Petrova et al⁽⁹⁾** reported that, hypertension, renal illness, obesity, and arthritis were the comorbidities with the largest independent impacts on depression risk among recent survivors.. While, **Yan et al⁽¹⁰⁾** clarified that, Among cancer survivors, heart and circulatory illness, as well as musculoskeletal problems, were linked to a greater incidence of depression.

As to relation between depression level and cancer stage, the present study exposed that there was a significant relation between depression level and cancer stage among patients as more than one quarter of those in the fourth stage of cancer suffered from moderate depression. Moreover, advanced stages (III, IV) of cancer patients were more susceptible to having mild and moderate depression. The possible explanation is that advanced stages of disease are often associated with more severe symptoms, increased physical impairment, more adverse effects of treatment and decreased

the expectations and wishes to cure that may cause increase the depression levels.

This result of the present study goes with, **Tsaras et al⁽¹¹⁾** reported that, Patients diagnosed with stage IV breast cancer had a higher incidence of depression than those diagnosed with stage I.

Based on the current study findings, the period of cancer suffering was statistically significant in relation to depression level as **less than one fifth** of those who had cancer for more than three years suffered from moderate depression. This conclusion might be attributable to the fact that the length or duration of the condition can cause emotions of helplessness, hopelessness, and uncertainty about survival and death.. Similarly, **Weeratunga et al⁽¹²⁾** reported that, the length of therapy has an effect on the severity of depressive symptoms.

In the present study, there was a significant relation between depression level and oral chemotherapy treatment as more than one third of those treated by oral chemotherapy suffered from moderate depression. Furthermore, there were significant predictors of moderate depression in cancer patients treated via oral chemotherapy. This could be due to treatment side effects, as well as a lack of control from health care providers over medication-taking by patients at home. Specific issues that were observed included unremembered dosage instructions and modifications, delayed or ignored diagnostic testing, delayed symptom

reporting, and omitted office visits which lead to disease complications and decrease quality of life resulting in appearance of depression features.

This findings was in agree with, **Kaptein et al⁽¹³⁾** reported that, Depression was discovered to be one of the most important psychosocial factors of oral anticancer therapy adherence

Conclusion:

Cancer patients are more likely to develop depression as a common consequence that affects the treatment process of cancer. Patients with gastrointestinal tract cancer, followed by head & neck cancer, eye cancer, then breast cancer having higher depression score. There was significant relation between depression level and the following clinical parameters of studied cancer patients; present of hypertension, had cancer duration from 6 months to 1 year, second cancer stage and oral chemotherapy treatment.

Recommendations:

- 1- A multidisciplinary psychiatric team should be actively included in each patient's therapy plan in the oncology outpatient clinic.
- 2- counseling programs for cancer patients that focus on enhancing and improving the psychological status of cancer patients.
- 3- Psychiatric and medical follow-up for clinical parameters as (hypertension or any comorbid-cancer stage- effect of treatment) for patients who suffering from cancer.

Table (1): Personal characteristics of the studied cancer patients (n=513)

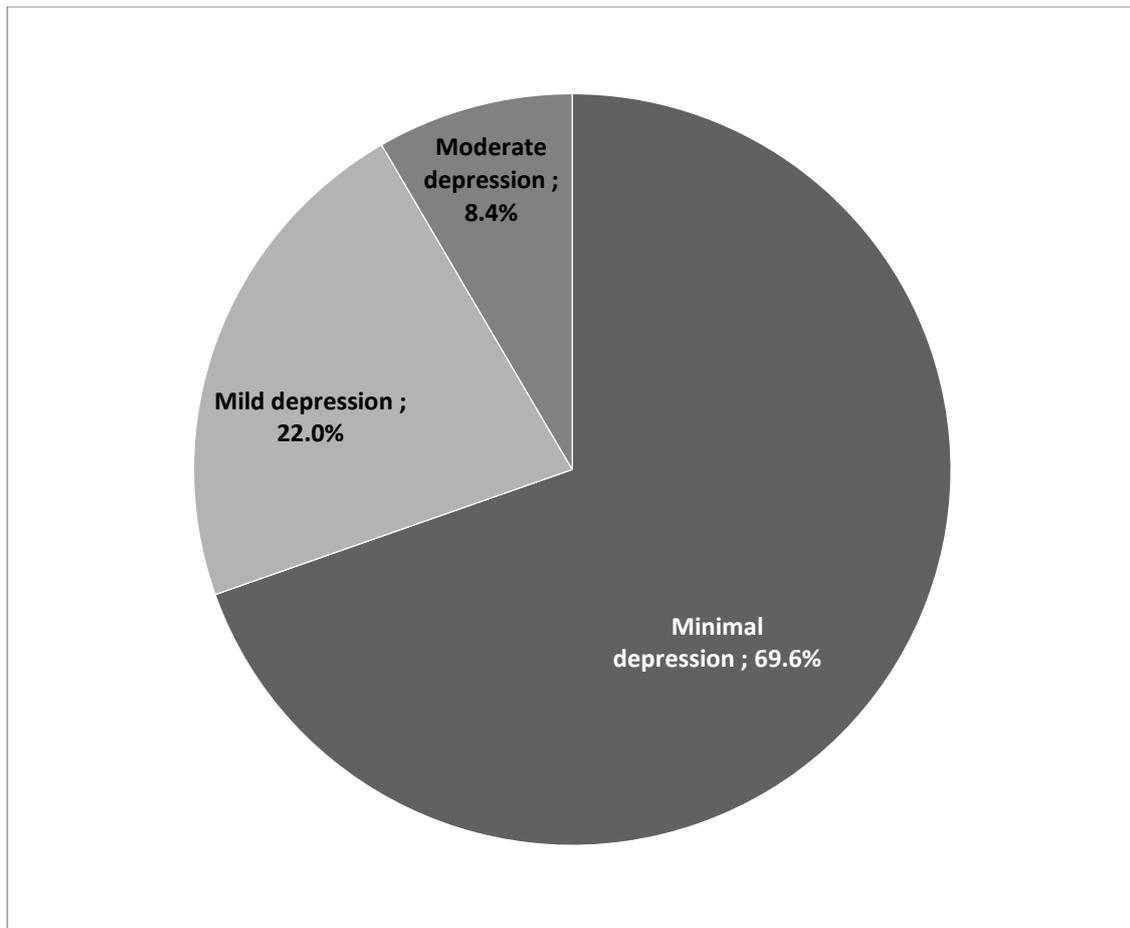
Personal characteristics	Number (N=513)	% (100%)
Age per years		
18-37 years	139	27.1
38-57 years	212	41.3
58-77 years	140	27.3
> 77years	22	4.3
Sex		
Females	300	58.5
Males	213	41.5
Level of education		
Illiterate	168	32.7
Primary and preparatory	56	10.9
Secondary	207	40.4
High education	82	16.0
Marital status		
Single	52	10.1
Married	330	64.3
Divorced	32	6.2
Widowed	99	19.3
Occupation		
House wife	252	49.1
Employee	98	19.1
Retired	61	11.9
Worker	87	17.0
Other	15	2.9
Religion		
Muslim	439	85.6
Christian	74	14.4

Table (2): Body system involved with cancer among the studied patients (n=513):

Body system involved with cancer	Number (N=513)	%(100%)
Gastrointestinal	168	25.8
Breast	131	20.1
Blood	85	13.9
Genitourinary	55	8.4
Endocrine\Neuroendocrine	45	6.9
Head and neck	37	5.6
Gynecologic	36	5.5
Musculoskeletal	25	3.8
Respiratory\Thoracic	25	3.8
Skin	22	3.2
Eye	10	1.5
Neurologic	10	1.5

Table (3): Clinical characteristics of the studied cancer patients (n=513):

Variables	number	Percent
Medical history		.
Hypertension	222	43.3
Diabetes mellitus	101	19.7
Hepatitis	64	12.5
Heart disease	26	5.1
None	100	19.4
Number of body system affected by Cancer		.
One system	377	73.5
More than one system	136	26.5
duration of cancer suffering		.
1 month to 6 months	140	27.2
> 6 months to 1 year	144	28.1
>1 year to 3 years	143	27.9
More than 3 years	86	16.8
Stage of cancer		.
First	137	26.7
Second	240	46.8
Third	118	23.0
Fourth	18	3.5
Treatment		.
Intravenous chemotherapy	284	51.7
Radiation	167	30.4
Oral chemotherapy	40	7.3
Intravenous hormonal therapy	58	10.6
Number of treatment methods		.
One type of cancer treatment	477	93.0
More than one type of cancer treatment	36	7.0



Figure(1): Distribution of depression level among the studied cancer patients :

Table (5): Relation between depression level and clinical parameters of the studied cancer patients (n.513):

Clinical parameters	Depression level						n. (513)	χ^2	P
	Minimal depression n=357		Mild depression n=113		Moderate depression n=43				
	No.	%	No.	%	No.	%			
Medical history	.	.	.	.	.	.
• Hypertension	124	55.9	52	23.4	46	20.7	222	12.37	0.02
• Diabetes mellitus	66	65.3	29	28.7	6	5.9	101		(S)
• Hepatitis	37	57.8	20	31.2	7	11	64		
• Heart disease	13	50	9	34.6	4	15.4	26		
• None	62	62	31	31	7	7	100		
Number of body system affected by cancer	.	.	.	.	.	.
• one system	236	62.6	100	26.5	41	10.9	377	2.35	0.31
• more than one system	50	36.7	56	41.2	30	22.1	136		
duration of cancer suffering	.	.	.	.	.	.
• From 1 month to 6 months	99	70.7	28	20.0	13	9.3	140		
• From 6 months to 1 year	113	78.5	25	17.4	6	4.2	144		
• From 1 year to 3 years	97	67.8	35	24.5	11	7.7	143		
• More than 3 years	48	55.8	25	29.1	13	15.1	86	16	0.014 (S)
Cancer Stage	.	.	.	.	.	.
• First	108	78.8	22	16.1	7	5.1	137		
• Second	178	74.2	49	20.4	13	5.4	240		
• Third	67	56.8	33	28.0	18	15.3	118		
• Fourth	4	22.2	9	50.0	5	27.8	18	40.77	0.0001 (S)
Treatment	.	.	.	.	.	.
• Intravenous chemotherapy	197	69.4	61	21.5	26	9.2	284		
• Oral chemotherapy	19	47.5	6	15.0	15	37.5	40	17.48	0.008
• Intravenous hormonal therapy	29	50	16	27.6	13	22.4	58		(S)
• Radiation	117	70.1	42	25.1	8	4.8	167		
Treatment methods	.	.	.	.	.	.
• One type of cancer treatment	335	70.2	105	22.0	37	7.8	477		
• More than one type of cancer treatment	22	61.1	8	22.2	6	16.7	36	3.57	0.168

χ^2 Chisquare test(S) Significant p<0.05

Table (6): Logistic regression for predicting variables of mild depression for cancer patients:

	Test of sig	Sig.	Exp (β)	95% C.I. for EXP (B)	
				Lower	Upper
Marital status.					
• Single (reference)					
• Married	1.702	.192	2.060	.695	6.103
• Divorced	6.692	.010	5.679	1.523	21.170
• Widowed	5.361	.021	3.965	1.235	12.726
Cancer stage					
• First stage (reference)					
• Second stage	.443	.506	1.219	.680	2.184
• Third stage	5.692	.017	2.196	1.151	4.192
• Fourth stage	10.114	.001	8.602	2.284	32.400

Exp-the odds ratios for the predictors C1= confidence interval

Table (7): Logistic regression for predicting variables of moderate depression for cancer patients:

	Test of sig	Sig.	Exp (β)	95% C.I. for EXP (B)	
				Lower	Upper
Cancer staging					
• First stage (reference)					
• Second stage	.010	.920	.950	.352	2.565
• Third stage	6.405	.011	3.575	1.333	9.589
• Fourth stage	12.522	.0001	17.345	3.571	84.239
Method of treatment					
• Intravenous chemotherapy(reference)					
• Oral chemotherapy	8.825	.003	5.375	1.772	16.301
• Intravenous hormonal therapy	1.277	.259	.409	.086	1.930
• Radiation	3.156	.076	.451	.188	1.086

Exp-the odds ratios for the predictors C1= confidence interval

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