ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research

Vol. 16, Issue, 06, pp.29015-29021, June, 2024
DOI: https://doi.org/10.24941/ijcr.47134.06.2024

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

PREVALENCE AND ASSOCIATED FACTORS OF DEPRESSION AMONG ADULT OUTPATIENTS TREATED FOR CANCER AT OCEAN ROAD CANCER INSTITUTE IN DAR ES SALAAM

Living D. Nyaki[1], Nazima Dharsee[1,2], Rachel J. Mtei[1] and Fileuka Ngakongwa[1]

[1]Department of Psychiatry and Mental Health, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Republic of Tanzania; [2]Ocean Road Cancer Institute, Dar es Salaam, Republic of Tanzania

ARTICLE INFO

Article History:
Received 20th March, 2024
Received in revised form
15th April, 2024
Accepted 24th May, 2024
Published online 30th June, 2024

Key words:
Cancer, Depression, Hope, Self-Efficacy.

***Corresponding author:**
Living D. Nyaki

ABSTRACT

Background: Depression is among the public health problems across the world and the leading cause of disability. A cancer diagnosis can lead to depression with global and Tanzania prevalence of 24% and 28% respectively. However, the associated factors of Depression in Cancer Patients in Tanzania have not been studied. This study seeks more recent information on the prevalence as well as the associated factors, and the results intend to raise awareness among healthcare providers on the importance of early diagnosis and management of depression in cancer patients. **Aim:** To determine the prevalence and associated factors of depression among cancer patients at Ocean Road Cancer Institute (ORCI) in Dar es Salaam. **Methods:** A descriptive cross-sectional study, using consecutive random sampling. Logistic regression was applied for the identification of independently associated factors. **Results:** The prevalence of depression is 62.6% among 369 participants. A higher risk of depression was found in those with Low levels of education,low perceived social support, low general self-efficacy, and low level of hope. **Conclusion:** This study shows depression in cancer patients is high, which can lead to poor prognosis of cancer; hence the need for psychosocial interventions at cancer centers.

Citation: ***Living D. Nyaki, Nazima Dharsee, Rachel J. Mtei and Fileuka Ngakongwa.*** **2024.** "Prevalence and associated factors of depression among adult outpatients treated for cancer at ocean road cancer institute in dar es salaam*". International Journal of Current Research*, 16, (06), 29015-29021.

INTRODUCTION

Chronic diseases like cancer through several biological, psychological, and social mechanisms (Horstmann *et al.*, 2012) may cause depression. Biologically a patient diagnosed with cancer may face various physiological changes and debilitating symptoms that may lead to physical disabilities, dependency, and even death. These biological changes have been the reason why cancer is the most feared diagnosis, thereby bringing about psychological distress such as hopelessness, loss of self-efficacy, and perception of being isolated. Social changes may include failure to produce, disturbed relationships, and burdens to the relatives, the patient may go into excessive sadness, loss of interest, worthlessness, and suicidal thoughts that eventually form a diagnosis of depression (Berihun and Shimeka, 2015)(Kohi *et al.*, 2019)(Young and Singh, 2018). Depression is among the leading psychiatric conditions in cancer patients, with its prevalence reaching 24% globally (Krebber *et al.*, 2014). Since depression is a disabling condition that increases cancer disease burden and poor cancer outcomes (Gunjur, 2016)(21), early diagnosis and treatment are important.

As is reported that 75% of cancer patients might be suffering from undiagnosed depression, global awareness and emphasis on early diagnosis and treatment of depression in cancer patients are noted (Tsaras, Papathanasiou and Mitsi, 2018). In Tanzania, 56.5 % of cancer patients die within 10 years of diagnosis (Lyimo *et al.*, 2019), depression might be among the contributory causes as a previous study reported the prevalence of depression in cancer patients to be 28% (Swai *et al.*, 2011). However, not only that the risk factors for depression in cancer patients in Tanzania not yet known, but also the differences in methodological as well as psychosocial issues due to the long duration between the previous and the current studies may influence the prevalence of depression in these patients. The current study seeks more recent information on the prevalence as well as the risk factors using outpatient populations that have never been studied in Tanzania.

MATERIALS AND METHODS

The study was conducted at ORCI in Dar es Salaam, Tanzania in 2020.

Ethical "Ethic" clearance was Obtained from MUHAS Institutional Review Board's (IRB) with Reference number IRB#: MUHAS-REC-04-2020-280. A consecutive sampling procedure was used to recruit 369 participants from the outpatient department. A total of 411 cancer patients who were 18 years old or older were approached and asked to participate in the study. Those who consented were included in the study, among them, 42 participants were excluded from the study due to various reasons including; being tired, especially those under chemotherapy, and feeling unwell due to pain, was within two weeks of being diagnosed with cancer; others refused as they wanted to be paid for participation and others did not give any reason.

Data collection tools: Social demographic factors associated with depression in cancer patients were determined through a structured questionnaire that contains information such as Sex, age, marital status, Education status, place of residence, and employment status. There were also structured clinical questionnaires that were used to study the association between clinical characteristics of cancer and depression. The questionnaire sought information regarding clinical characteristics of cancer such as cancer type, stage of cancer, the treatment being sought, duration since diagnosis, and episodes of cancer. Prevalence of depression was obtained through the use of a self-administered 9-item Patient Health Questionnaire (PHQ-9) that screened for depression in each participant. In this tool, the higher the score the more the likelihood of depression (Wagner *et al.*, 2018), with cut-off points of 5, 10, 15, and 20 representing mild, moderate, moderately severe, and severe depression, respectively. Item 9 is a screening question on suicide risk. The patient who answered yes to question 9 underwent further assessment for suicide risk and was then referred back to the attending Doctor for appropriate management. The tool has been used for the assessment of depression in various populations including cancer patients with Cronbach's alpha of 0.84 (Hinz *et al.*, 2016). The tool has been validated for use in Tanzania(Smith *et al.*, 2019).

Perceived social support was assessed by using a self-administered tool known as the Multidimensional Scale of Perceived Social Support (MSPSS). This is the tool that is validated for use in low-income countries and has been used in countries such as Malawi (Stewart *et al.*, 2014) and Uganda (Stewart *et al.*, 2014). It measures how the interviewee perceives the support received from 3 different sources: significant others, family, and friends (Zimet, 2016). Subscale scores were obtained by adding all subscale scores divided by 4, while the total scale score was calculated by adding all items divided by 12 (Zimet, 2016). Perceived social support is considered good as the score goes higher with a mean score of 1 to 2.9 representing low support, 3 to 5 moderate support, and 5.1 to 7 high support (Zimet, 2016).
Hope was assessed by using a Local hope scale that was developed and validated for use in Tanzania (Siril *et al.*, 2020). It is a self-administered twenty-item tool that has been used in the assessment of hope in people suffering from chronic diseases in Tanzania with a good internal validity of 0.958 Cronbach's alpha (Siril *et al.*, 2020). Each item was scored as 1, 2, 3, and 4 with response options; definitely false, somewhat false, somewhat true, and definitely true respectively. While the total score ranges from 20 to 80, the higher the better was used as the judgment since there are no standard cut-off points for this tool (Siril *et al.*, 2020).

Self-efficacy was assessed with a self-administered measure of self-belief of the competence to cope with a stressful situation (Luszczynska and Schwarzer, 2005), and was assessed using a multicultural validated General Self Efficacy scale (Luszczynska and Schwarzer, 2005). The tool has been used in several lower-income countries including Tanzania (Fawzi *et al.*, 2019)(Walusaga, Kyohangirwe, and Wagner, 2012). In this tool, each item was scored as 1 – Not at all true, 2 – Hardly true, 3 – Moderately true, and 4 – exactly true. The total score ranges from 5 to 20, of which the higher the score the more self-efficacy. (Luszczynska and Schwarzer, 2005). Patient files were used for clarification of the clinical characteristics of cancer, such as type, severity, treatment modality, and duration since diagnosis. Two research assistants who are nursing officers were trained on how to use the tools and they assisted in data collection including assistance to participants on how to feel the questionnaire and clarifying the questions.

Data analysis: Data was entered using a Statistical Package for Social Science (SPSS for Windows version 23).Bivariate analyses were done to determine the presence of significant associations and the strength of associations between independent and outcome variables reported. Logistic regression was applied for the identification of independently associated risk factors for all bivariate variables with associations at $p<0.20$.

RESULTS

Description of social-demographic characteristics of participants: The age range of participants was between 18-88 years of age, most of them were below 60 years with a mean age (SD) of 48.61(20.39). Most participants were females (69.6%), mostly residing in rural areas, as they were in Dar es Salaam only for treatment.

Description of cancer characteristics of participants: The most commonly encountered cancer diagnosis was breast Cancer 101(27.4%) followed by cervical cancer 97(26.3%). Participants with cancers involving the nervous system were almost the same in numbers as those with leukemia4(1.1%) and 7(1.9%) respectively. One-third 123(33.3%) of participants were in cancer stage four which was the highest compared to other stages, it was followed by stage two 103(27.9%), then stage three 68(18.4%), and lastly, stage one which was 55(14.9%). However, the cancer stages of 20(5.4%) participants could not be identified as they were not documented in the medical records. About two-thirds of participants 245(66.4%) were diagnosed with cancer within one year from the time of the study, while the rest 124(33.6%), were diagnosed in more than one year from the time of the study. Among the participants, 174(47.2%), were receiving chemotherapy alone, 51(13.8%) were under radiotherapy and 144(39.0%) were receiving a combination of radiotherapy and chemotherapy. It was the first time to be diagnosed with cancer for 329(89.2%) participants while it was the second time for the rest

Prevalence of depression: According to the PHQ-9 scores; and using 5 as the cut-off point 231(62.6%) of participants had depression, while the rest 138(37.4%) did not have depression. This was then categorized into severity scores of which 143(38.8%) had mild depression, 68(18.4%) had

moderate depression, 13(3.5%) had moderately severe depression and 7(1.9%) had severe depression.

Association between social demographic, psychological, and cancer characteristics with depression in cancer patients: Of all the total of 15 factors, 7 of them were found to be significantly associated with depression on bivariate analysis. These are age, residence, marital status, level of education, perceived social support, General self-efficacy, and hope. While it is noted that all the psychological factors assessed were associated with depression, all the cancer characteristics were not statistically associated with depression as seen in Tables 1,2 and 3. A logistic multivariate analysis was performed on factors that had a p-value below 0.20; as presented in Table 4, these variables were age, marital status, level of education, place of residence, perceived social support, general self-efficacy, and hope. From the logistic regression, secondary education, perceived social support, general self-efficacy as well as hope were found to be significantly associated with depression with p-values below 0.05.

Low education is a risk factor for developing depression in cancer patients as those with secondary education demonstrated two times the risk compared to tertiary education (AOR 2.252; 95%CI 1.027, 4.937; p=0.043). Other levels of education were not statistically significant on multivariate analysis as shown in the table below. Participants who had low perceived social support carried a three times risk for depression (AOR 3.21; 95%CI 1.495, 6.904; p=0.003) as compared to those with high perceived social support on general self-efficacy, it was revealed that the lower the general self-efficacy the higher the risk of depression. Low general self-efficacy had two times the risk for depression compared to high general self-efficacy. Another factor that was associated with depression was hope as this study revealed around two and a half times the risk of developing depression to those cancer patients with a low level of hope (AOR 2.59; 95%CI 1.346, 4.969 p=0.004) as compared to those with a high level of hope.Age, marital status as well as a place of residence were not significantly associated with depression in cancer patients.

DISCUSSION

This study aimed at determining the prevalence of depression among people diagnosed with cancer as well as assessing the factors associated with depression. This is the first study to assess whether social demographic factors, cancer characteristics, and psychological factors such as perceived social support, hope, and general self-efficacy are associated with depression among adults diagnosed with cancer in Tanzania. The study found the prevalence of depression to be 62.6% when using the cut-off point of 5 in the PHQ9, with 1.9% of participants being severely depressed. While the prevalence of depression in this study looks to be so high, almost similar results have been observed in previous studies done in sub-Saharan African countries such as Rwanda in the year 2019 in which among cancer patients assessed in a cross-sectional hospital-based study, 67.7% were found to have depression with 4% of participants being severely depressed (Uwayezu *et al.*, 2019). Another study from sub-Saharan African countries with a high prevalence of depression was done in Zambia in the year 2016 with 80% of participants found to have depression (Paul, Musa, and Chungu, 2016). However, a bit lower but still a large percentage of depressed cancer patients have been observed in other African countries like Egypt 46.8% (Hanan Yousif Aly, 2017) Kenya 42% (Angachi, 2014), and Ethiopia 28% (Alemayehu *et al.*, 2018). Apart from Africa, almost similar results have been observed in Asian countries like China 57.1% (Yan, 2019) and 50% in Iran (Nikbakhsh *et al.*, 2014). In European countries, the trend is a bit low from these results as observed in countries like Germany 24% (Hartung and Bra, 2017), Spain 36.6% (Fonseca *et al.*, 2018), and Greece 38.2% (Tsaras, Papathanasiou and Mitsi, 2018). The differences in prevalence between continents are in keeping with the WHO report that a large proportion of people with depression as well as its burden; resides in low and middle-income countries, particularly in Asia and Africa (Ambaw, 2015). The current study shows a high prevalence of depression compared to the previous study (28%) done in Tanzania (Swai *et al.*, 2011). The difference could be due to several factors such as the difference in the study population, the long duration between the two studies, and psychosocial issues related to the time of study e.g. this study was done during the COVID 19 pandemic. Differences in the data-collecting instruments could also be the reason.

The current study identified that having low education is a risk factor for developing depression in cancer patients of which secondary education was two times higher the risk (AOR 2.252) compared to tertiary education P= 0.043. The finding agrees with other studies done in Denmark (Friberg *et al.*, 2019) Greece (Tsaras *et al.*, 2018) and Pakistan (Khalil *et al.*, 2016). From this study, most of the participants (38%) were found to have high perceived social support, 35.5% had moderate perceived social support, and the rest 26.3% had low perceived social support. Low perceived social support was found to be associated with more depression similar to other previous studies done elsewhere such as in Spain (Fonseca *et al.*, 2018) Morocco (Kadiri *et al.*, 2017), and Ethiopia (Alemayehu *et al.*, 2018). Psychosocial assistance in identifying what kind of support a cancer patient needs from family, friends, and significant others is of paramount importance to correct the negative thoughts that these patients may have regarding what they need for their health. However, since perceived social support is only the measure of how someone is confident of the support they receive from others, (meaning it might not be the actual support), regular family meetings to assess the actual level of support for possible intervention can help.

The current study agrees with other studies which were done in Germany (Maik, 2017), and Greece (Gogou, Panagiotou, and Galanos, 2010), and a systematic review (Borjalilu *et al.*, 2017) that low General self-efficacy is a risk factor for the development of depression in cancer patients. In this study, the percentage of cancer patients with low general efficacy where 38.5% which is significant and may explain the risks of patients being less competent to cope with stressful situations and adhere to recommended management hence increasing the burden of both cancer disease and psychological well-being. (Luszczynska and Schwarzer, 2005). Hope was found to be associated with depression in cancer patients who participated in this study, with those with a low level of hope presenting with more depression (76.7%) compared to those with moderate hope 67.7%, while those with a high level of hope had less depression (45.0 %).

Table 1. Association between social-demographic characteristics with depression in cancer patients (N=369)

Variable	No depression N (%)	Depression N (%)	Total N (%)	Chi-square	P-value
Age					
< 60	96(33.6)	190(66.4)	286(100)	7.975	0.005
≥ 60	42(50.6)	41(49.4)	83(100)		
Sex					
Male	39(34.8)	73(65.2)	112(100)	0.456	0.499
Female	99(38.5)	158(61.5)	257(100)		
Residence					
Urban	62(44.9)	76(55.1)	138(100)	5.338	0.021
Rural	76(32.9)	155(67.1)	231(100)		
Marital status					
Married/Cohabiting	88(37.8)	145(62.2)	233(100)	4.661	0.198
Single	18(31.0)	40(69.0)	58(100)		
Divorced/separated	13(31.7)	28(68.3)	41(100)		
Widow/Widower	19(51.4)	18(48.6)	37(100)		
Level of education					
No formal education	11(23.9)	35(76.1)	46(100)	11.592	0.009
Primary education	67(38.1)	109(61.9)	176(100)		
Secondary education	33(33.3)	66(66.7)	99(100)		
Tertiary education	27(56.3)	21(43.8)	48(100)		
Employment status					
No employment	40(31.7)	86(68.3)	126(100)	2.611	0.271
Self-employed	73(40.3)	108(59.7)	181(100)		
Employed	25(40.35)	37(59.7)	62(100)		
Source of Income					
No source of income	6(25.0)	18(75.0)	24(100)	2.523	0.283
From Family and Friends	45(35.2)	83(64.8)	128(100)		
From employment/Self Employment	87(40.1)	130(59.9)	217(100)		

Table 2. Association between psychological characteristics with depression in cancer patients (N=369)

Variable	No depression N (%)	Depression N (%)	Total N (%)	Chi-square	P-value
Perceived Social Support					
Low	15(15.5)	82(84.5)	97(100)	39.795	0.000
moderate	45(34.4)	86(65.6)	131(100)		
High	78(55.3)	63(44.7)	141(100)		
General Self Efficacy					
Low	30(21.1)	112(78.9)	142(100)	40.343	0.000
Moderate	33(33.7)	65(66.3)	98(100)		
High	75(58.1)	54(41.9)	129(100)		
Hope					
Low	27(23.3)	89(76.7)	116(100)	28.428	0.000
Moderate	40(32.3)	84(67.7)	124(100)		
High	71(55.0)	58(45.0)	129(100)		

Table 3. Association between cancer characteristics and depression

Variable	No depression N (%)	Depression N (%)	Total N (%)	Chi-square	P-value
Type of cancer					
Breast Cancer	40(39.6)	61(60.4)	101(100)	8.497	0.580
Lung cancer	3(27.3)	8(72.7)	11(100)		
Gastrointestinal cancer	14(48.3)	15(51.7)	29(100)		
Dermatological cancer	12(42.9)	16(57.1)	28(100)		
Cancer involving head and neck	16(34.0)	31(66.0)	47(100)		
Cervical cancer	30(30.9)	67(69.1)	97(100)		
Cancer Involving Central Nervous System	1(25.0)	3(75.0)	4(100)		
Pancreatic cancer	3(37.5)	5(62.5)	8(100)		
Thyroid cancer	5(27.8)	13(72.2)	18(100)		
Prostate cancer	10(52.6)	9(47.4)	19(100)		
Leukemia	4(57.1)	3(42.9)	7(100)		
Stages of cancer					
Stage I	21(38.2)	34(61.8)	55(100)	1.589	0.811
Stage II	43(41.7)	60(58.3)	103(100)		
Stage III	24(35.3)	44(64.7)	68(100)		
Stage IV	42(34.1)	81(65.9)	123(100)		
Stage unspecified	8(40.0)	12(60.0)	20(100)		
Duration since diagnosis					
Within one year	88(35.9)	157(64.1)	245(100)	0.682	0.409
More than one year	50(40.3)	74(59.7)	124(100)		
Treatment being sought					
Radiotherapy	19(37.3)	32(62.7)	51(100)	0.819	0.664
Chemotherapy	69(39.7)	105(60.3)	174(100)		
Combination therapy	50(34.7)	94(65.3)	144(100)		
Number of cancer diagnosis					
First diagnosis	123(37.4)	206(62.6)	329(100)	0.000	0.989
Second diagnosis	15(37.5)	25(62.5)	40(100)		

Table 4. Independent strength of association between depression in cancer patients and selected factors (N=369)

Variable	Crude Odds Ratio (95% CI)	P-value	Adjusted Odds Ratio (95% CI)	P-value
Age				
< 60	2.03(1.24, 3.32)	0.005	1.56(0.870, 2.803)	0.135
≥ 60	Ref		Ref	
Residence				
Rural	1.66(1.08, 2.57)	0.021	1.46 (0.884, 2.396)	0.140
Urban	Ref		Ref	
Marital status				
Single	1.35(073, 2.50)	0.341	1.26(0.621, 2.547)	0.524
Divorced/separated	1.31(0.64, 2.66)	0.459	0.99(0.448, 2.215)	0.992
Widow/Widower	0.58(0.29, 1.15)	0.120	0.55(0.249, 1.215)	0.139
Married/Cohabiting	Ref		Ref	
Level of education				
No formal education	4.09(1.69, 9.92)	0.002	1.88(0.661, 5.372)	0.236
Primary education	2.09(1.09, 3.99)	0.025	1.396(0.656, 2.968)	0.387
Secondary education	2.57(1.27, 5.21)	0.009	2.252(1.027, 4.937)	0.043
Tertiary education	Ref		Ref	
Perceived Social Support				
Low	6.77(3.56, 12.87)	0.000	3.21(1.495, 6.904)	0.003
moderate	2.37(1.45, 3.86)	0.001	1.17(0.635, 2.137)	0.623
High	Ref		Ref	
General Self Efficacy				
Low	5.19(3.04, 8.84)	0.000	2.22(1.113, 4.436)	0.024
Moderate	2.74(1.59, 4.72)	0.000	1.79(0.953, 3.343)	0.070
High	Ref		Ref	
Hope				
Low	4.04(2.32, 7.02)	0.000	2.59(1.346, 4.969)	0.004
Moderate	2.57(1.54, 4.29)	0.000	1.74(0.930, 3.241)	0.083
High	Ref		Ref	

While the findings are similar to studies done in Brazil(Antônio, Spencer Hartmann Junior and Hartmann, 2019), China (Yang *et al.*, 2014)(Rajandram *et al.*, 2011), and Germany(Fischer, Cripe and Rand, 2018), a study to set the cutoff points on the hope scale used for this population is of paramount importance as it has not yet been done. While this study provides important information regarding the prevalence and associated factors for depression in cancer patients, care should be taken in interpreting these findings due to the following limitations; some of the participants could not identify their cancer stage which was also not found in the medical records, recall bias could have interfered with the results in answering time-framed questions such as two weeks for depression and some of the data collecting tools such as the Local hope scale had no standard cut off points. In summary, the study reveals Depression is highly prevalent among people diagnosed with cancer. Possible limitation to this study was recall bias on symptoms of depression to Cancer Patients. We therefore recommend implementation research, adapting mental health intervention for cancer patients with depression and other mental health concerns as well as regular on the job training the for health care providers with an emphasis on screening and early intervention for depression in all cancer patients attending treatments

ACKNOWLEDGMENTS

We highly acknowledge the Government of Tanzania for the financial support and all other people involved in the study

DECLARATIONS OF INTEREST

Ethical clearance: It was obtained from the MUHAS research and publication committee and the permission to collect the data was obtained from Ocean Road Cancer Institute.

Conflicts of Interests: The authors declare no conflicts of interests

Funding: Government of Tanzania

REFERENCES

Adler, R. H. 2009. 'Engel's biopsychosocial model is still relevant today', *Journal of Psychosomatic Research*. Elsevier Inc., 676. , pp. 607–611. doi: 10.1016/j.jpsychores.2009.08.008.

Alemayehu, M. *et al.* 2018. 'A descriptive analysis of depression and pain complaints among patients with cancer in a low-income country', pp. 1–14.

Ambaw, F. 2015. '80 % of depression burden is among people living in low- and middle- income countries LMICs . '.

American Psychiatric Association 2013. *Diagnostic And Statistical Manual of Mental Disorders : DSM-5*. 5th edn.

Angachi, M. O. 2014. 'The psychosocial aspects among adul Cancer patients attending Oncology clinic at Moi Teaching and Referral Hospital, Eldoret, Kenya Milkah Obwenyi Angachi bachelor of psychology counselling . registration number : h56 / 78009 / 09 a research disserta', August. .

Antônio, Spencer Hartmann Junior, J. and Hartmann, J. S. 2019. 'Annals of Psychiatry and Clinical Neuroscience Hope Theory and Its Relation to Depression: A Systematic Review OPEN ACCESS', 22. , pp. 1–5.

Ashraf, K., Rizwana, R. and Knoll, N. no date. 'Psychosocial predictors of distress and depression among South African breast cancer patients'. doi: 10.1002/pon.4589.

Basis, T. T., Model, P. and Malmgren, H. 2005. 'from Chp."The Theoretical Basis of the Psychosocial Model" by Helge Malmgren. Pp.21-35 from', pp. 21–35.

Berihun, F. and Shimeka, A. 2015. 'Prevalence and correlates of anxiety and depression among cancer

patients in the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia'. doi: 10.17352/2455-5460.000022.

Borjalilu, S. *et al.* 2017. 'Exploring the Role of Self-Efficacy for Coping With Breast Cancer : A Systematic Review', 42. , pp. 42–57. doi: 10.19187/abc.20174242-57.

Bray, F., Ferlay, J. and Soerjomataram, I. 2018. 'Global Cancer Statistics 2018 : GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries', pp. 394–424. doi: 10.3322/caac.21492.

Cheng, C. 1997. 'Role of perceived social support on depression in Chinese adolescents: A prospective study examining the buffering model', *Journal of Applied Social Psychology*, 279. , pp. 800–820. doi: 10.1111/j.1559-1816.1997.tb00660.x.

Chung, J. *et al.* 2018. 'Background / Aims Sociodemographic and clinical characteristics Patient-reported measures Statistical analysis Patient characteristics Prevalence of and factors associated with anxiety or depression Change in anxiety, depression, and QOL from baseline t', 333. , p. 2018.

Fawzi, M. C. S. *et al.* 2019. 'Agents of change among people living with HIV and their social networks: Stepped-wedge randomized controlled trial of the NAMWEZA intervention in Dar es Salaam, Tanzania', *BMJ Global Health*, 43. , pp. 1–14. doi: 10.1136/bmjgh-2018-000946.

Felger, J. C. and Lotrich, F. E. 2013. 'NEUROSCIENCE FOREFRONT REVIEW INFLAMMATORY CYTOKINES IN DEPRESSION : NEUROBIOLOGICAL MECHANISMS AND THERAPEUTIC IMPLICATIONS I', *Neuroscience*. IBRO, 246, pp. 199–229. doi: 10.1016/j.neuroscience.2013.04.060.

Fischer, I. C., Cripe, L. D. and Rand, K. L. 2018. 'Predicting symptoms of anxiety and depression in patients living with advanced cancer: the differential roles of hope and optimism', *Supportive Care in Cancer*. Supportive Care in Cancer, 2610. , pp. 3471–3477. doi: 10.1007/s00520-018-4215-0.

Fonseca, P. J. *et al.* 2018. 'Factors associated with anxiety and depression in cancer patients prior to initiating adjuvant therapy', *Clinical and Translational Oncology*. Springer International Publishing. doi: 10.1007/s12094-018-1873-9.

Fredirick, M. . 2017. 'Global Health', 31715. , p. 936178.

Friberg, A. S. *et al.* 2019. 'Educational level and the risk of depression after prostate cancer', *Acta Oncologica*. Taylor & Francis, 585. , pp. 722–729. doi: 10.1080/0284186X.2019.1566773.

Gogou, P., Panagiotou, I. and Galanos, A. 2010. 'Distress in Males and Females With Cancer'. doi: 10.1177/1049909110376808.

Goldman, L. S., Nielsen, N. H. and Champion, H. C. 1991. 'Awareness, Diagnosis, and Treatment of Depression', pp. 569–580.

Gotlib, I. H. and Hammen, C. L. 2008. *Handbook of depression*. Guilford Press.

Gunjur, A. 2016. 'The added effect of depression on patients with cancer', *Lancet Oncology*. Elsevier Ltd, 204516. , p. 30111. doi: 10.1016/S1470-204516. 30111-5.

Hamilton, I. 2016. 'Out of Hours Understanding grief and bereavement', 21October. , p. 2016. doi: 10.3399/bjgp16X687325.

Hanan Yousif Aly, A. A. E. and A. E. S. Mohamed 2017. 'Depression and Anxiety among Females with Breast Cancer in Sohag University : Results of an Interview Study', 2, pp. 1–7.

Hartung, T. J., and Bra, E. 2017. 'ScienceDirect The risk of being depressed is significantly higher in cancer patients than in the general population : Prevalence and severity of depressive symptoms across major cancer types', 72, pp. 46–53. doi: 10.1016/j.ejca.2016.11.017.

Hinz, A. *et al.* 2016. 'Assessment of depression severity with the PHQ-9 in cancer patients and in the general population', *BMC Psychiatry*. BMC Psychiatry, pp. 1–8. doi: 10.1186/s12888-016-0728-6.

Horstmann, E. *et al.* 2012. 'Clinical biopsychosocial risk factors for depression in lung cancer patients : a comprehensive analysis using data from the Lung Cancer Database Project', pp. 1300–1306. doi: 10.1093/annonc/mds061.

James, S. L. *et al.* 2018. 'Global, regional, and national incidence, prevalence, and years lived with disability for 354 Diseases and Injuries for 195 countries and territories, 1990-2017: A systematic analysis for the Global Burden of Disease Study 2017', *The Lancet*, 39210159. , pp. 1789–1858. doi: 10.1016/S0140-673618. 32279-7.

Kadiri, S. *et al.* 2017. 'Associated factors with psychological distress in Moroccan breast cancer patients : A cross-sectional study', 31, pp. 26–33. doi: 10.1016/j.breast.2016.10.015.

Kalita, D. *et al.* 2014. 'Step 1 : Download MongoDB - Step 2 : Choose Studio 3T', p. 8990. doi: 10.4103/0971-8990.143889.

Kerr, L. 2020. 'Culture and Medicine primary care', 175November 2001. , pp. 349–352.

Khalil, A. *et al.* 2016. 'Prevalence of Depression and Anxiety amongst Cancer Patients in a Hospital Setting : A Cross-Sectional Study', 2016.

Kohi, T. W. *et al.* 2019. 'Cancer-related concerns and needs among young adults and children on cancer treatment in Tanzania : a qualitative study'. BMC Cancer, pp. 1–9.

Krebber, A. M. H. *et al.* 2014. 'Prevalence of depression in cancer patients : a meta-analysis of diagnostic interviews and self-report instruments', 130September 2013. , pp. 121–130.

Liu, Q. *et al.* 2019. 'Changes in the global burden of depression from 1990 to 2017 : Findings from the Global Burden of Disease Study', *Journal of Psychiatric Research*. Elsevier, June. , pp. 0–1. doi: 10.1016/j.jpsychires.2019.08.002.

Luszczynska, A., Scholz, U. and Schwarzer, R. 2005. 'The general self-efficacy scale: Multicultural validation studies', *Journal of Psychology: Interdisciplinary and Applied*, 1395. , pp. 439–457. doi: 10.3200/ JRLP. 139.5.439-457.

Luszczynska, A. and Schwarzer, R. 2005. 'The General Self-Efficacy Scale : Multicultural Validation Studies', 1395. , pp. 439–457.

Lyimo, E. P. *et al.* 2019. 'Cancer Mortality Patterns in Tanzania : A abstract', XI. doi: 10.1200/JGO.19.00270.

Maik, T. 2017. 'Optimism, pessimism and self-efficacy in female cancer patients', 479. , pp. 849–855. doi: 10.1093/jjco/hyx079.

Mbatia, J., Shah, A. and Jenkins, R. 2009. 'Knowledge, attitudes and practice pertaining to depression among primary health care workers in Tanzania', *International Journal of Mental Health Systems*, 3, pp. 1–6. doi: 10.1186/1752-4458-3-5.

Nasseri Nayerehi, T. F. 2018. 'eISSN: 2251-9920', *caring Sciences*, p. 2018. doi: 10.15171/jcs.2018.023.

Niedzwiedz, C. L. *et al.* 2019. 'Depression and anxiety among people living with and beyond cancer : a growing clinical and research priority'. BMC Cancer, pp. 1–8.

Nikbakhsh, N. *et al.* 2014. 'Prevalence of depression and anxiety among cancer patients', p. 20894.

Ocean Road Cancer Institute 2020. *Clinical Oncology section*.

Paul, R., Musa, G. and Chungu, H. 2016. 'Prevalence of Depression among Cervical Cancer Patients Seeking Treatment at the Cancer Diseases Hospital', 156. , pp. 57–62. doi: 10.9790/0853-1506115762.

Priggerson, H. G. 2016. 'The hidden dangers of cancer diagnosis', p. 23319686. doi: 10.1136/bmj.i4446.

Purkayastha, D. *et al.* 2017. 'Prevalence of Depression in Breast Cancer Patients and its Association with their Quality of Life : A Cross-sectional Observational Study', p. 20894. doi: 10.4103/IJPC.IJPC.

Rajandram, R. K. *et al.* 2011. 'Interaction of hope and optimism with anxiety and depression in a specific group of cancer survivors: A preliminary study', *BMC Research Notes*. BioMed Central Ltd, 41. , p. 519. doi: 10.1186/1756-0500-4-519.

Sadock, B. 2015. *Mood Disorders*. 11th editions.

Sharpe, L., Curran, L., Butow, P., Thewes, B. 2018. 'Fear of cancer recurrence and death anxiety'. doi: 10.1002/pon.4783.

Siril, H. *et al.* 2020. 'The value of hope : development and validation of a contextual measure of hope among people living with HIV in urban Tanzania a mixed methods exploratory sequential study'. BMC Psychology, pp. 1–16.

Smith, H. R. 2015. 'Depression in cancer patients : Pathogenesis, implications, and treatment Review . ', 94. , p. 2015.

Smith, M. C. *et al.* 2019. 'Neurology, Psychiatry and Brain Research Validating the Patient Health Questionnaire-9 PHQ-9 . for the screening of depression in Tanzania', *Neurology, Psychiatry, and Brain Research*. Elsevier, 31October 2018. , pp. 9–14. doi: 10.1016/j.npbr.2018.11.002.

Snyder, C. R, and Lopez, S. J. 2009. *Oxford handbook of positive psychology*. Oxford library of psychology.

Statistics, N. B. of 2013. '2012 POPULATION AND HOUSING CENSUS Population Distribution by'.

Stewart, R. C. *et al.* 2014. 'Validation of the multi-dimensional scale of perceived social support MSPSS . and the relationship between social support, intimate partner violence and antenatal depression in Malawi', pp. 1–11.

Sullivan, L. 2006. 'Issues in Estimating Sample Size for Confidence Intervals', 13, p. 81.

Swai, P. J. *et al.* 2011. 'Psychiatric morbidity among adult cancer patients admitted at ocean road cancer aam, tanzania a dissertation in part fulfillment of the requirement for the award of the degree of masters of medicine in psychiatry in university of nairobi by dr praxeda ja'.

Trill, M. D., and Madrid, C. P. 2017. 'Psychological aspects of depression in cancer patients : an update', September 2012. . doi: 10.1093/annonc/mds350.

Tsaras, K. *et al.* 2018. 'Assessment of depression and anxiety in breast cancer patients: Prevalence and associated factors', *Asian Pacific Journal of Cancer Prevention*, 196. , pp. 1661–1669. doi: 10.22034/APJCP.2018.19.6.1661.

Tsaras, K., Papathanasiou, I. V and Mitsi, D. 2018. 'Assessment of Depression and Anxiety in Breast Cancer Patients : Prevalence Assessment of Depression and Anxiety in Breast Cancer Patients : Prevalence and Associated Factors', May. . doi: 10.22034/APJCP.2018.19.6.1661.

Uwayezu, M. G. *et al.* 2019. 'Anxiety and Depression Among Cancer Patients : Prevalence and Associated Factors at a Rwandan Referral Hospital', 22. , pp. 118–125.

Vartolomei, L. *et al.* 2018. 'Systematic Review : Depression and Anxiety Prevalence in Bladder Cancer Patients', 4, pp. 319–326. doi: 10.3233/BLC-180181.

Wagner, L. I. *et al.* 2018. 'HHS Public Access', 1233. , pp. 485–493. doi: 10.1002/cncr.29969.Screening.

Walker, Z. J., Jones, M. P. and Ravindran, A. V 2017. 'Psychiatric disorders among people with cancer in low- and lower-middle-income countries : study protocol for a systematic review and meta-analysis'. doi: 10.1136/bmjopen-2017-017043.

Walusaga, H. A., Kyohangirwe, R. and Wagner, G. J. 2012. 'Gender differences in determinants of condom use among HIV clients in Uganda', *AIDS Patient Care and STDs*, 2611. , pp. 694–699. doi: 10.1089/apc.2012.0208.

Wang, J. *et al.* 2017. 'Prevalence of depression and depressive symptoms among outpatients : a systematic review and meta-analysis'. doi: 10.1136/bmjopen-2017-017173.

Wen, S. and Xiao, H. 2018. 'The risk factors for depression in cancer patients undergoing chemotherapy : a systematic review'. Supportive Care in Cancer.

Yan, X. 2019. 'Prevalence and risk factors of anxiety and depression in Chinese patients with lung cancer : a cross-sectional study'.

Yang, Y. L. *et al.* 2014. 'Prevalence and associated positive psychological variables of depression and anxiety among Chinese cervical cancer patients: A cross-sectional study', *PLoS ONE*, 94. . doi: 10.1371/journal.pone.0094804.

Young, K. and Singh, G. 2018. 'Biological Mechanisms of Cancer-Induced Depression', 9July. , pp. 1–9. doi: 10.3389/fpsyt.2018.00299.

Zimet, G. 2016. 'Multidimensional Scale of Perceived Social Support MSPSS . - Scale Items and Scoring Information', December. , pp. 3–5.

****