

Predictors of Functional Health Status in Patients with Cancer in Government Tertiary Hospitals in Ogun State

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Abstract:

Globally, low-and middle-income countries are experiencing significant increases in rates of non-communicable diseases, including cancer. Many cancer patients are prone to experiencing a decline in functional status over time include bathing, dressing, toileting, transferring, continence, and feeding. . While cancer patients are exposed to untold hardship in various forms, little is known what factors can predict their functional status, especially in a developing country; hence this study was conducted to understand how various factors interact to predict functional status among persons living with cancer in Ogun State, Nigeria. This study adopted a quantitative design and descriptive cross-sectional method to assess the predictors of functional health status among patients living with cancer in the government tertiary hospitals in Ogun State. Purposive sampling was used to select 310 respondents. A validated pretested questionnaire was developed using Katz, Lawton and Bartel scale which contains four sections, while data were collected over a period of two weeks. Descriptive and inferential statistics was used for data analysis. Results revealed that more than half of the respondents were patients with breast cancer (57.6%), and majority of respondents were in stage II cancer. The stage and type of cancer significantly predicts the functional status of a cancer patient and educational level positively had a significant relationship with functional status ($df=36$, $r=0.128$ $X^2=447.9$, $p<0.05$) while stage of cancer had a negative significant

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relationship with the phenomenon ($r = -0.800$; $p < 0.05$). This implies an increase in stage of cancer result to a decline in functional activities of a cancer patient. Conclusively, development of a standard assessment tool for functional health status in cancer patients through inter-professional collaboration in Nigerian health sector would aid in assessing level of functional health status of cancer patients.

Keywords: Stage of Cancer, Type of Cancer, Functional Status, Predictors,



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Introduction

Worldwide, low- and middle-income countries are experiencing significant increases in rates of non-communicable diseases, including cancer (Miranda, et al, 2018). By 2030, new cancer diagnoses are projected to reach 2.3 million a year, approximately (60%) of those patients, and up to 70% of all cancer mortality will be occurring in 65 years of age or older (Abduljawad, 2018). The challenge of elongating lifespan of cancer patients has been a problem despite the knowledge and great scientific improvements in oncology field. Cancer has been well controlled to 90% in most cases, though it is still evident that half of cancer patients in both developed and developing world receive sub-optimal symptom management (Fitzmaurice, et al, 2016). The leading barrier to well controlled cancer symptom is its inadequate assessment and reassessment (Li, et al, 2018).

Despite all these widely used assessments, cancer symptoms remain a prevalent problem (Admass, et al, 2020). Fitzmaurice, et al, (2017) estimated that up to 80% of cancer patients experience disease related symptoms, and an estimated 65-80% of cancer patients with advanced disease suffer symptoms so severe that it negatively impacts their activities of daily living, disrupts their sleep pattern, depresses their mood and interferes with normal social functioning and relationships. Also, uncontrolled symptoms delay healing and recovery, leading to poorer outcomes for cancer patients (Torre, et al, 2017). Cancer patients require an accurate assessment of performance status and physical function to inform treatment decisions as physical function and performance status is difficult because patients spend the majority of their time outside of the clinic, self-report to providers, and undergo dynamic changes throughout their treatment experiences (Gresham, et al., 2018).

Functional status is operationalized as an individual's ability to perform activities of daily living. According to a systematic review, 36.7% and 54.6% of cancer patients reported difficulties in performing basic and Instrumental Activities of Daily Living (IADL), respectively. Furthermore, these patients are prone to experience decline in functional status over time (Toba, et al, 2019). The assessment of supportive care needs by health-care providers aims to identify patients' desire for actual services or resources in satisfying physical and daily living, psychological, sexual, patient care as well as health system and information needs. Unmet needs often occur when patients perceive a lack of care or support that is necessary to achieve optimal well-being. Cancer patients have greater supportive care needs as compared to those with other diseases and rate the highest unmet needs in physical and psychological domains. Despite mounting evidence suggests that greater care needs are associated with impaired Health-Related Quality of Life (HRQOL) in cancer patients, little is known specifically for lung cancer patients (Ung, et al, 2016).

Cancer can be acute or chronic, and its sub-classification dictates treatment (Makhlouf, et al, 2020). Over the last 25 years, significant advances have been made in the fields of oncology and pain management, but the incorporation of this information into clinical practice is lagging (Ung, et al, 2016). Despite increased recognition of cancer pain and widespread adoption of clinical recommendations for its management, adequate and consistent pain relief continues to be difficult to achieve in patients with oncologic disease. Inadequate



management is most prevalent in children, members of underserved communities and impoverished countries, geriatric patients, and outpatients with metastatic progression of disease (Toba, et al, 2019). Factors contributing to the under-treatment of cancer pain include fear of overprescribing, lack of knowledge concerning adequate treatment, and patient hesitations regarding the use of opioids (Wiffen, et al, 2016).

Pain is a burdensome illness with the potential to negatively impact patients' and their families' quality of life (Reis-Pina, et al, 2017). A recent meta-analysis reportedly pooled prevalence rates of 55% for cancer patients who were receiving disease modifying treatment and 64% in those with advanced metastatic or terminal disease (Everdingen, et al, 2018). Several authors have highlighted the need for adequate control of cancer symptoms and many published guidelines advocate a standardized strategic approach to its management (World Health Organisation, 2017; Scottish Intercollegiate Guidelines Network, 2017).

Although control of cancer symptoms is attainable in most patients with treatment modalities that are available and relatively safe, many cancer patients suffer unnecessarily due to inadequate control of Cancer related Pain (CRP) (Reis-Pina, et al, 2017). This inadequacy is multifactorial; it is associated in particular with negative perceptions and various barriers that originate from among patients, families, informal caregivers, health care providers, institutions, and society in general (Reis-Pina, et al, 2017).

Functional status, also known as the performance status, is an independent predictor of cancer survival and it is often impaired in patients with advanced disease. Performing activities of daily living is an important patient priority; minimizing burden on others was 'very important' for 89% patients (Boland, et al, 2019). Symptoms negatively impact function. Better symptom management could improve performance status. However, longitudinal data exploring the association between symptoms, analgesics and performance status are limited. Understanding predictors of performance status could help identify those at risk of deterioration, so palliative interventions can be planned (Downing, et al, 2019). If such interventions help maintain function sufficient for independent community-based living, health and social care costs could be reduced (Abernethy, et al, 2018). The Eastern Cooperative Oncology Group (ECOG) Performance Status (PS) and the Karnofsky Performance Status (KPS) are common scales used for assessing a patient's level of function and ability of self-care, other methods like the Patient-reported outcomes and wearable activity monitors have also been devised (Gresham, et al, 2018).

Karnofsky Performance Status (KPS) is a measure of overall function (including impact of psychosocial factors), allowing patients to be classified according to their functional impairment (Boland, et al., 2019). This study will be assessing the predictors of functional status in patients with cancer in Government Tertiary Hospitals in Ogun State. The main objective of this study was to determine the predictors of functional health status in patients with cancer in Government Tertiary Hospitals in Ogun State. The specific objectives of this study were to:



1. assess the functional health status of patients with cancer in Government Tertiary hospitals in Ogun State;
2. determine how socio demographic characteristics will predict functional health status among patients with cancer in Government Tertiary hospitals in Ogun State.
3. assess how type of cancer predicted functional health status in patients with cancer in Government Tertiary hospitals in Ogun State; and
4. assess how stage of cancer will predict functional health status among patients with cancer in Government Tertiary hospitals in Ogun State.

Research Hypotheses

H₀1: There is no significant relationship between patients related factor level of education and functional health status

H₀2: There is no relationship between the disease related factor (stage of cancer) and functional status of the patients

Methodology

This study was a cross sectional descriptive study, designed to assess the predictors of functional health status in patients with cancer in Government Tertiary Hospitals in Ogun State. The target population are cancer patients [outpatient] at the two selected hospital (excluding under 18years) which are Olabisi Onabanjo Teaching Hospital and Federal medical center Abeokuta. Sample size of 310 cancer patients was calculated using the Leslie-Kish formula. Participants of this study were selected using purposive sampling techniques, every patient met was assigned a number and any patient who is available and ready to participate was approached to participate in the study until the sample size number was met.

For the purpose of this study, data collection used a structured self-administered questionnaire (adapted from Katz scale, Lawton scale, and Bartel scale) which contained 4 sections. The validity of the instrument was established through face and content validity. A pilot study was carried out using 10% of the total sample size (10% of 310 is 31). Cronbach Alpha Statistics method was used to derive the reliability coefficient value of 0.812. Primary data collection was carried out by the researcher in the selected hospital. The instrument was designed in English language and administered in the same language. Respondents were given an explanation about the purpose and objectives of the study before being asked for consent and to fill in the questionnaire. Completed questionnaires were collected immediately after completion. Data collection was carried out over a period of two weeks. Descriptive and inferential statistics were used for analysis of data.

Results

Table 1: Demographical data of the participated cancer patient

Variables	Frequency	Percentage (%)
Gender	Male	84
		27.3



	Female	224	72.7
Age: Mean age=45years±0.80	20-29yrs	19	6.2
	30-39yrs	37	12.0
	40-49yrs	164	53.2
	greater than 50yrs	88	28.6
Years of being a cancer patient	less than 2yrs	34	11.0
	2-5yrs	161	52.3
	6-10yrs	70	22.7
	Greater than 10yrs	43	14.0
Level of Education	SSCE	7	2.3
	Nce/ND	65	21.1
	DEGREE/HND	161	52.3
	Msc	56	18.2
	PhD	19	6.2

Table 1 indicates demographical data of the participants. It revealed that majority (72.7%) of the patients were female and most of the patients were between the age bracket of 40-49years (mean age=45years). Strictly above average of the respondents had been a cancer patient for 2-5years (52.3%) and more than half of the patient were graduate of tertiary education (52.3%). Therefore, this study shows that majority of the respondents were female, within age 40-49years with young experience as a cancer patient.

Table 2: Levels of functional health status of patients with cancer in Government Tertiary hospitals in Ogun State

Functional activities	Levels of functional status			mean±SD	Average mean±SD
	dependent 1	Occasionally dependent 2	Independent 3		
Feeding	29(9.4%).	77(25%).	202(65.6%).	2.56±0.66	2.41±0.82
Bathing	85(27.6%).	0(0%).	223(72.4%).	2.72±0.44	
Grooming	0(0%).	116(37.7%).	192(62.3%).	2.62±0.48	
Dressing	68(22.1%).	167(54.2%).	73(23.7%).	2.01±0.67	
Bowels	82(26.6%).	102(33.1%).	124(40.3%).	2.13±0.80	
Bladder	74(24%).	115(37.3%).	119(38.6%).	2.14±0.78	
Toilet use	59(19.2%).	143(46.4%).	106(34.4%).	2.15±0.71	
Transfers (Bed to chair and back)	71(23.1%)	143(46.4%)	94(30.5%)	1.56±1.14	
Mobility	31(10.1%)	158(51.3%)	119(38.6%)	1.90±1.03	
Stairs	84(27.3%)	159(51.6%)	65(21.1%)	1.93±0.69	

KEY: I= INDEPENDENT 3; OD=2 OCCASSIONALLY DEPENDENT; D=1 DEPENDENT, Criterion Mean = 1.5 (OCCASSIONALLY DEPENDENT); AVERAGE MEAN= 2.41 IMPLIES FAIRLY INDEPENDENT

Table 2 revealed the level of functional status of the respondents based on their daily activities. The result shows that majority of the respondents can feed (65.6%), bath (72.4%), and groom (62.3%) themselves with minor assistance. Slightly above average of the respondents can dress (54.2%), be on mobile (51.3%), stairs (51.6%) transfer to bed (46.4%) and use toilet (46.6%) with a major assistance from health providers or someone else.

In addition, the level of functional status shows an average mean value of 2.41 which indicates fairly independent to the respondents daily functional activities. This implies that most of the cancer patient were fairly independent to perform their daily functional activities.

Table 3: Tests of how socio demographic factors will predict functional health status among patient with cancer in Government Tertiary hospital in Ogun state

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2337.259 ^a	10	233.726	266.537	.000	.900
Intercept	51757.113	1	51757.113	59022.957	.000	.995
Gender	786.746	1	786.746	897.192	.000	.751
Age	3.020	3	1.007	1.148	.330	.011
Level of education	7.315	3	2.438	2.781	.041	.027
Experience as a cancer patient	7.751	2	3.875	4.419	.013	.029
Error	260.439	297	.877			
Total	148475.000	308				
Corrected Total	2597.698	307				

a. R Squared = .900 (Adjusted R Squared = .896)

The above table shows socio-demographic factors as a predictors towards functional status of cancer patient in government tertiary hospital Ogun state. The level of significance for the predictors is less than 0.05 and the Eta square shows the effect or predictors size. From table 3; the most predictors factors out of the demographic was gender with Eta size of 0.751, p-value of 0.000, followed by experience as a cancer patient with Eta size of 0.029 while the least predictors was age with an eta size of 0.011 and p-value of 0.33. The composite effect of socio-demographic factors on functional status was 0.896 which implied that socio-demographic factors predicted functional status of the cancer patient by 89.6%.

Table 4 Regression analysis showing the extent at which type of cancer predict functional health status in patient with cancer related pain

Model	Sum of Squares	Df	Mean Square	F	Sig.
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1	Regression	514.600	1	514.600	75.593	.000 ^b
	Residual	2083.098	306	6.808		
	Total	2597.698	307			
T		62.080				
Prob (t-statistics)		.000				
R ²		0.198				
Coefficient		.685				
a. Dependent Variable: functional status						
b. Predictors: (Constant), types of cancers						

Table 4 showed the extent at which types of cancer predict functional status. The result on Table 4 revealed R^2 of 0.198 which explains the extent at which types of cancer predicted functional status, it shows that only 19.8 % of the total variation is explained by the types of cancer while the balance of 80.2% is explained by factors outside this study. This implies a fair impact of type of cancer on functional health status. The coefficient from the table was found significant. This is determined from the t-statistics result ($t= 62.08$) which is more than the t-tabulated ($t=1.96$). This is further confirmed by the probability values of f-statistics (P-value=0.00) which is less than 5% level of significance. We therefore infer from the result of this finding that the extent of prediction of types of cancer is positive and significant on functional status of cancer patients.

Table 5: Regression analysis showing the extent at which stage of cancer predict functional health status in patient with cancer related pain

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1660.995	1	1660.995	542.610	.000 ^b
	Residual	936.703	306	3.061		
	Total	2597.698	307			
T		41.567				
Prob (t-statistics)		.000				
R ²		0.639				
Coefficient		. 2.459				
a. Dependent Variable: functional status						
b. Predictors: (Constant), Stage of cancer						

Table 5 showed the extent at which stage of cancer predicts functional status. The result on Table 5 indicate R^2 of 0.639 which explains the extent at which stage of cancer predict functional status, it shows that only 63.9 % of the total variation is explained by the stages of cancer while the balance of 36.1% is explained by factors outside this study. This implies a high impact of stage of cancer on functional health status. The coefficient from the table was

found significant. This is determined from the t-statistics result ($t=41.56$) which is more than the t-tabulated ($t=1.96$). This is further confirmed by the probability values of f-statistics (P-value=0.00) which is less than 5% level of significance. We therefore infer from the result of this finding that the extent of prediction of stage of cancer is positive and significant on functional status of cancer patients.

Test of Hypotheses

H₀₁: There is no significant relationship between patients related factor level of education and functional health status

Table 6: Relationship between level of education and functional status of cancer patient

		Functional status				X ²	R	Df	P-value
		Dependent	Occasionally dependent	Independent	Total				
Level of education	SSCE	7 (2.3%)	0(0%)	0(0%)	7 (2.3%)	447.8 70 ^a	0.128	36	.025
	NCE	0(0%)	65 (21.1%)	0(0%)	65 (21.1%)				
	DEGREE	0(0%)	74 (24%)	87 (28.2%)	161 (52.2%)				
	MSC	0(0%)	56 (18.2%)	0(0%)	56 (18.2%)				
	PHD	0(0%)	0	19 (16.2%)	19 (6.2%)				
Total		7 (2.3%)	195 (63.3%)	106 (34.4%)	308 (100%)				

Table 6 shows that there is a significant association between the level of education and functional status of cancer patients with a p-value of $0.025 < 0.05$ ($df=36$, $r=0.128$, $X^2=447.9$). Therefore, the null hypothesis is hereby rejected by this study. This implies an increase in level of education may lead to an improvement in functional status of a cancer patient.

H₀₂: There is no relationship between the disease related factor (stage of cancer) and functional status of the patients

Table 7: Relationship between stage of cancer and functional status of cancer patient

		Functional status	Remarks
Stage of cancer	Pearson	-.800**	Reject null

	correlation		hypothesis
	Sig. (2-tailed)	.000	
	N	308	

*. Correlation is significant at the 0.05 level (2-tailed).

The results in Table 7 revealed a negative significant relationship between the respondent's stage of cancer and their functional status ($r = -0.800$; $p=0.000 < .05$). The hypothesis which stated that "There will be no significant relationship between respondent stage of cancer and their functional status is hereby rejected by this findings. This implies an increase in respondents stage of cancer will decrease their functional status

Discussion of findings

This study shows that the level of functional status shows an average mean value of 2.41 which indicates fairly independent to the respondents daily functional activities. This implies that most of the cancer patients were fairly independent to perform their daily functional activities. This finding seems the same with a findings conducted by Muhandiramge, et al (2022) who found that with a progressive population of cancer survivors due to advances in anti-cancer treatment, it is vital that functional decline is addressed to ensure that patients with cancer are provided the opportunity to maintain a high quality of life and to live independently. This result was found consistent with the present finding due to their years of experience as a cancer patient and their stage of cancer. Thus, most respondents from this study were neither at early stage nor at late stage but at stage II of their cancer stage diagnosis. They can still be independent with certain daily activities.

Furthermore, this study showed the commonly affected functional activities on dependent patients as bathing, stairs, and bowels activities. This result against the finding led by Neo, et al revealed from their study in 2017. They reported that the mean prevalence of impaired ADLs was 36.7% in the overall cohort, with the most commonly affected basic ADLs being personal hygiene, ambulation, and transfers. This result was not correlated with the present study due to differences in age of the respondents and stage of cancer. Most respondents in the previous study were above 65years compared to respondents of the current study with a mean age of 45years at stage II.

The composite effect of socio-demographic factors on functional status was 0.896 which implied that socio-demographic factors predicted functional status of the cancer patient by 89.6%. The result of this findings shows that the extent at which types of cancer predicted functional status among cancer patient was fair and significant ($R^2=0.198$; $F_{(306)}=75.593$ P -value=0.000).. This implies that type of cancer will predict the extent of functionality of a patient by 19.8%. This finding corroborate with a study led by Blackwood, et al (2020) who discovered that breast and prostate cancers conferred the greatest risk of impaired functional status. Functional impairment typically increased proportionally to stage in breast, colorectal, lung, and prostate cancers. Similarly, Fitzmaurice, et al (2016) estimated that up



to 80% of cancer patients experience disease related symptoms, and an estimated 65-80% of cancer patients with advanced disease suffer symptoms so severe that it negatively impacts their activities of daily living, disrupts their sleep pattern, depresses their mood and interferes with normal social functioning and relationships. Moreover, this result was also in line with the finding of Petrick, et al, (2014) who found that functional declines in patients with lung, prostate, breast, and colorectal cancer within one year of diagnosis when compared with other type of cancer. They further press that these deficits had not returned to baseline levels after one year in the groups with lung, breast or colorectal cancer, a finding the authors attribute to either early death due to increased mortality in these cancer types or disease-related declines in physical function.

This study revealed a high prediction rate of cancer stage on functional status for cancer patients ($R^2=0.639$; $F_{(306)}=542$ P-value=0.000). This implies that stage of a cancer highly determines the functionality of a cancer patients by 63,9%. This finding correlates with a study led by Van Abbema, et al (2017) who found a cancer diagnosis to be a significant predictor of functional decline. Nearly half (43.6%) of the elderly cancer group showed functional status declines compared to 28.1% of the early cancer stage. Supported by a study conducted by La Carpia, et al (2017) who reported that statistically significantly poorer functional status scores in cancer survivors, when compared to early cancer stage patients. Similarly, Granger, et al (2014) also demonstrated that poorer scores in various functional outcomes in patients with non-small cell lung cancer when compared to age-matched cancer, with cancer being associated with poor scores (84% of predicted distance) and quadriceps strength (mean difference 4.8 kg, 95% CI 1.6–8.1) at baseline. This result shows that the higher the age or stage of cancer the poorer the functional activities of the patient which is associated with the present study that shows that the stage of a cancer will highly determine the patient functional activities.

This finding also revealed a negative significant relationship between the respondents stage of cancer and their functional status ($r = -0.800$; $p=0.000 < .05$). This implies an increase in stage of cancer will decrease the functional status of cancer patients. This result correlates with a study conducted by Toba, et al (2019) who found that, 36.7% and 54.6% of cancer patients reported difficulties in performing basic and instrumental activities of daily living (IADL), respectively. Furthermore, these patients are prone to experience decline in functional status over time. This result were found the same with the present study because most cancer patients spend the majority of their time outside of the clinic, self-report to providers, and undergo dynamic changes throughout their treatment experiences. Therefore, it is important to anticipate and diagnose stage of the cancer patients as routine clinical practice, also it is vital to address functional decline by ensuring that patients with cancer are provided the opportunity to maintain a high quality of life and to live independently.

In addition, this study further showed a significant association between the level of education and functional status of cancer patients with a p-value of $0.025 < 0.05$. This result correlated with a study led by Admass, et al (2020), who agreed that Nurses who had a master's degree in nursing were significantly associated with good knowledge and attitude towards cancer



management. Therefore, both patients and family members should actively participate in development of a reliable and effective communication during treatment. As a result of this, regular training and revision of the contents of cancer management education in the academic curriculum of nursing education are recommended.

Conclusion

Stage of cancer and type of cancer were significant to predict functional health status of a cancer patient. Though, majority of the patient were at their stage two but negative relationship was established from this finding between the stage of cancer and functional status which implies that an increase in stage of cancer will lead to a decrease in functional capability or functional decline of the patient. Therefore, to prevent and managed this, there must be early detection and proper interventional approach to maintain functional health status as long as possible among cancer patients in government tertiary hospital Ogun State.

Recommendations

Based on this finding, the following recommendations were made

1. Development of a standard assessment tool for functional health status in cancer patients through inter-professional collaboration in Nigerian hospitals would aid in assessing level of functional health status of cancer patients.
2. Assisted or independent care to cancer patients as the stage progresses especially by caregivers, family members and the public through health education/ general awareness to reduce the negative effect of predictors of functional health status.
3. Addition of cancer management to continuing education course for all health workers in all parastatals.

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