

Quality of life and Its Determinants among Cervical Cancer Patients in South India

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Abstract

Introduction: Cervical Cancer is the leading cause of morbidity and mortality in India. It affects the patient's, physical and psychological state which results in lower quality of life (QoL). Women with cervical cancer may require counselling and time to enable them to deal with the disease and its treatment. The present study aimed to determine the quality of life and its determinants among cervical cancer patients. **Methods:** A cross-sectional study was undertaken from April 2017 to September 2017 in a regional cancer centre in South India. Cervical cancer patients (N= 210) with histological confirmation were interviewed at the hospital. European Organization of Research and Treatment of Cancer (EORTC) questionnaire core module, QLQ-C30 Version 3.0, and recommended scoring algorithm were used to measure and analyse QoL. The Association of socio-economic determinants on quality of life was evaluated using multiple logistic regression. **Results:** Among 210 cervical cancer patients enrolled, the majority 106 (50.5%) of women were between the age group 46 to 59 years and most, i.e. 167(63.0%) were not literate. The median score in the global health status was 50.0[IQR 33.3 – 66.7], 66.7[IQR 60.0 – 80.0] in physical functioning, and 83.3[IQR 66.7 – 83.3] in pain symptoms respectively which were poor compared to reference score of EORTC for all normal females and those with any cancer. The factors which were significantly associated with the GHS QoL score were the advanced stage of disease (OR:2.1, 95%CI: 1.1 – 3.9) and the age of the patients ≥ 60 years compared with ≤ 45 years (OR:18.4, 95%CI: 6.8 – 50.1). **Conclusion:** Cervical cancer patients had poor global health status compared to the reference score for all females with any cancer and the normal females. Advanced stage of cancer and older age have a significant association with QoL.

Keywords: Quality of life- cervical cancer- EORTC QLQ-C30

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Introduction

An estimated 570,000 new cases of cervical cancer (CC) have been reported globally in 2018 with India contributing 97,000 new cases and 60,000 deaths. India had the highest estimated number of cervical cancer deaths in 2018 (Globocan, 2018). Cervical cancer is the leading cause of mortality among young women in developing countries and it is a major public health problem, affecting middle-aged women, particularly in less-resourced countries (Arbyn et al., 2020).

Cervical cancer affects both the patient's physical and emotional wellbeing which in turn affects their quality of life (QoL). QoL is "a state of well-being which is a composite of two components: 1) the ability to perform everyday activities which reflects physical psychological, and social well-being, 2) patient satisfaction with levels of functioning and the control of disease and/or

treatment-related symptoms"(Gotay and Moore, 1992).

Usually, a woman's physical and emotional state is affected when diagnosed with cervical cancer. It is reported that shock, fear, self-blame, powerlessness, and anger are the most common emotions experienced by cancer patients (Perrin et al., 2006). In comparison to the general population, cervical cancer patients also have considerable social problems and impaired sexual function (Park et al., 2007). These women may require counseling, patience, and time to enable them to deal with the disease and its treatment. They also require psychological, emotional social, family, and financial support (Taneepanichskul et al., 2011).

Social stigma and negative perceptions are usually seen among women diagnosed with cancer. (Sahoo, 2019) Physical and social isolation were noted in a qualitative study conducted in India among cancer patients, primary caregivers, and healthcare providers. It was noted that

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patients have a fear that people will look down on them if they detect cancer, and if they have children, they will fear it could affect their children. Commonly the family members and community thought that the patient deserves to suffer (Nyblade and colleagues, 2017). Participants in an Indian study on cancer stigma believed that others would assume cancer was the product of “sin,” that they would be rejected by their communities and families, and ostracised owing to the incorrect belief that cancer was an infectious disease (Gupta et al., 2015). It is known that stigma affects physical and mental health outcomes in the general population and also disrupts interpersonal and psychological factors (Hatzenbuehler et al., 2013).

The burden of cervical cancer and its impact on patients justifies the necessity for a quality of life assessment before treatment and reasonable efforts taken to alleviate their suffering. (Kumar, 2016) It is not merely a matter of accumulating years but also a process of “adding life to years, not years to life”. However, assessing the QoL in cancer patients is given the lowest importance, especially during treatment (Castro et al., 2017).

The present study aimed to determine the quality of life and its determinants among cervical cancer patients in South India.

Materials and Methods

This study was part of a more extensive study. (Somanna et al., 2020) The data was collected from April 2017 to September 2017 using a cross-sectional study design from cervical cancer patients at a regional cancer centre from Bengaluru, Karnataka, India. Histopathologically confirmed cervical cancer patients were recruited from the hospital with a population-based cancer registry (PBCR) and a hospital-based cancer registry (HBCR). Patients were interviewed in person with a standardized questionnaire to assess QoL and their baseline and clinical information were collected from their medical records.

During the study, 430 cervical cancer patients were identified (Table 1) Only 210 patients were available for the present study after excluding i) 52 patient's ineligible due to referral to terminal/palliative care, ii) 96 patients were moved to a different hospital or were not available for interview, iii) 38 patients were not willing to consent and iv) 34 patients had incomplete information. More details of the collection of data pertaining to sample size, variables under study, inclusion, and exclusion criteria are described elsewhere (Somanna et al., 2020).

The European Organization of Research and Treatment of Cancer (EORTC) quality of life questionnaire core module, QLQ-C30 Version 3.0 (Kannada version) was administered to assess the QoL among cervical cancer patients (Aaronson et al., 1993). The questionnaire comprises of 30 questions assessing functional scale score, symptoms scale score, single item scale score and a global health status (GHS) score. The questionnaire is attached as a supplement (Supplement 1).

Analysis of QoL score for different domains and their interpretation

The scoring of the questionnaire data was performed using the EORTC manual (Fayers et al., 2001). All scores were transformed to a 0-100 scale. A high score of GHS and functional scores (physical, role, emotional, social & cognitive) reflects a better overall QoL or functional capacity. Conversely, a high score for symptom scale scores and single-item scale scores denotes severe symptoms (fatigue, nausea, vomiting, etc.) associated with poor QoL. The different QoL scores in the present study were compared with reference scores for all normal females and those with cancer given by EORTC (Scott et al., 2008). The factors which were associated with QoL on global health status (GHS), functional scale, symptom scale, and single-item scale were analyzed after categorizing their respective QoL score into two groups using median for separation of the groups.

Statistical Methods

QoL scores were summarized in terms of the median with the interquartile range as the data were not normally distributed which was tested by Kolmogorov-Smirnov and Shapiro test. Unconditional logistic stepwise forward regression analysis was used to find independent factors associated with QoL on various domains after stratifying the QoL score into two groups (based on the median value). Present study QoL scores were compared with reference scores for all normal females and those with cancer given by EORTC (Scott et al., 2008). Variables showing a univariate association with QoL (at $p < 0.20$) were included in the regression analysis. A p -value < 0.05 was considered statistically significant. Data analysis was performed using Statistical Package for the Social Sciences (SPSS Inc. Released 2009. PASW Statistics for Windows, Version 18.0. Chicago:)

Results

Among 210 women with cervical cancer enrolled, the majority 106 (50.5%) were between the ages of 46 and 59 years, and most 167 (63.0%) were not literate, 158 (71.4%) were financially dependent for livelihood, and nearly half, 104(49.5%) were in late-stage (IIIA+ IV) of cancer (Table 1).

The different domains' QoL scores were compared with reference scores (EORTC) for all normal females and those with any cancer. The median GHS score of cervical cancer patients before cancer-specific clinical treatment was 50.0[IQR 33.3 – 66.7], lower than that for all normal females 70.0(at the age of 55) and those with any cancer 58.3[IQR 41.7 – 83.3]. The median QoL score on the functional scale domain comprising of physical, emotional, and social functioning was 66.7 [IQR 60.0 – 80.0], 66.7[IQR 50.0 – 75.0], and 66.7[IQR 55.0 – 100], respectively, indicating lower functional ability compared to females with any cancer 80.0[IQR 60.0 – 93.3], 75.0[IQR 50.0 – 83.0] and 83.3[IQR 50.0 – 100] points respectively. Patients reported QoL scores on the cognitive functioning scales, with median scores of 83.3[66.7 – 83.3] which was not significant compared to reference scores 83

Table 1. Distribution of Socio-Demographic, Clinical, and Other Variables among the Subject Enrolled and not Enrolled in the Study

Variable	Subjects enrolled N= 210	Subjects not enrolled N=220
Age (in years)		
≤ 45	61 (29.0)	45 (20.5)
46 – 59	106 (50.5)	89 (40.4)
≥60	43 (20.5)	86 (39.1)
Literacy status		
Not literate	167 (63.0)	179 (81.4)
Literate	43 (37.0)	41 (18.6)
Area of Residence		
Rural	150 (71.4)	169 (76.8)
Urban	60 (28.6)	51 (25.2)
Financial Dependence for livelihood		
Yes	158 (75.2)	-
No	52 (24.8)	-
Any Health Insurance		
Yes	19 (9.0)	-
No	191 (91.0)	-
Clinical Staging of the disease		
Early-stage (IIA + IIB)	106 (50.5)	-
Late-stage (IIIA+ + IV)	104 (49.5)	-

among females with any cancer. The symptom domain's pain and fatigue scale scores resulted in higher QoL scores of 83.3 [IQR 66.7 – 83.3] and 77.8 [IQR 55.6 – 88.9]

compared to reference scores 16.7[IQR 0.0 – 50.0] and 33.3[IQR 11.1 – 55.6] respectively indicating high severity of symptoms. In single item scale scores, the median scores for constipation and financial concerns 66.7[IQR 33.3 – 66.7] and 66.7[IQR 66.7 – 100] were higher than reference values (Table 2 and Figure 1).

The patients with older age (≥ 60 years) had 18.4 times lower GHS compared to those ≤ 45 years of age (95% CI:6.8 – 50.1). Patients with late-stage cervical cancer had 2.1-times lower GHS as compared to patients with early-stage cervical cancer (95% CI: 1.1–3.9). The other socio-demographic variables like the area of residence, not being literate, presence of any health insurance, and being financially dependent for livelihood was not associated with the GHS QoL score (Table 3).

We found that the functional capacity on the physical scale was significantly lower among patients aged ≥60 years and to some extent among those aged 45-59 years compared to patients aged ≤45 years (Table 4). Late-stage cancer patients had 3.3 times lower functional capacity as compared to early-stage cancer patients (95% CI: 1.7 – 6.4) (Table 4). The pain symptom score domain was significantly affected only by stage of cancer, as patients with late-stage cancer had 5.8 times more severe symptoms compared to early-stage cancer patients (95% CI: 1.9 – 17.7) (Table 5).

Discussion

The GHS score of the cervical cancer patients prior to cancer-specific clinical treatment was lower when compared to the reference score by EORTC given for all females with all cancer and the normal females. We

Table 2. Median Score of Quality of Life in Various Domains

Domain	Scores (n= 210) Median [IQR]	Reference values from EORTC (All cancer, All stage among Females) (Scott et al., 2008)
Global health status /QoL ^a	50.0 [33.3 – 66.7]	58.3 [41.7-83.3]
Functional Scale ^b		
Physical Function	66.7 [60.0 – 80.0]	80 [60-93.3]
Role Function	83.3 [66.7 – 100.0]	66.7 [50-100]
Emotional Function	66.7 [50.0 – 75.0]	75 [50-83.3]
Social Function	66.7 [55.0 – 100.0]	83.3 [50-100]
Cognitive Function	83.3 [66.7 – 100.0]	83.3 [66.7-100]
Symptoms Scale ^c		
Pain	83.3 [66.7 – 83.3]	16.7 [0 -50]
Fatigue	77.8 [55.6 – 88.9]	33.3 [11.1 – 55.6]
Nausea and Vomiting	16.7 [0.0 – 16.7]	0 [0. 16.7]
Single Item Scale ^c		
Dyspnea	0.0 [0.0 – 33.3]	0 [0 – 33.3]
Insomnia	33.3 [0.0 – 33.3]	33.3 [0 – 66.7]
Appetite loss	33.3 [0.0 – 33.3]	0 [0 - 33.3]
Constipation	66.7 [33.3 – 66.7]	0 [0 - 33.3]
Diarrhea	33.3 [33.3 – 33.3]	0 [0 – 0]
Financial concerns	66.7 [66.7 – 100.0]	0 [0 - 33.3]

^a, Global health status (i.e. Overall QoL score): 0–100, high scores indicate high QoL; ^b, Functioning dimension: 0–100, high scores indicate the high functioning level; ^c, Symptom dimension, single item dimension: 0–100, high scores indicate severe symptoms

Table 3. Factors associated with Quality of Life (Global health Status)

Variable	Global health status		Univariate Odds ratio (95%CI)	Adjusted Odds ratio (95%CI)
	≤Median n (%)	>Median n (%)		
Age (in years)				
≥60	34 (79.1)	9 (20.9)	17.2 (6.4 – 45.9)*	18.4 (6.8 – 50.1)*
46 – 59	72 (67.9)	34 (32.1)	9.6 (4.5 – 20.8)*	9.1 (4.2 - 19.8)*
≤ 45	11 (18.0)	50 (82.0)	1	1
Literacy Status				
Not literate	93 (55.7)	74 (44.3)	1.0 (0.5 - 2.0)	-
Literate	24 (55.8)	19 (44.2)	1	
Area of Residence				
Urban	32 (57.1)	24 (42.9)	1.1 (0.6 – 2.0)	-
Rural	85 (55.2)	69 (44.8)	1	
Financial Dependence for livelihood				
Yes	91 (57.6)	67 (42.4)	1.4 (0.7 - 2.6)	-
No	26 (50.0)	26 (50.0)	1	
Any Health Insurance				
No	106 (55.5)	85 (44.5)		-
Yes	11 (57.9)	8 (42.1)		
Clinical Staging of the disease				
Late-stage (IIIA+ + IV)	67 (64.4)	37 (35.6)	2.2 (1.2 – 4.2)*	2.1 (1.1 - 3.9)*
Early-stage (IIA + IIB)	50 (47.2)	56 (52.8)	1	1

observed a median global health status score of 50 points, which is lower compared with reference scores (EORTC) for all normal females and those with any cancer 70.0 (at the age of 55) and 58 points respectively (Scott et

al., 2008).

We observed that the functional scale domain comprising physical and social functioning the median score was below 67 points, which shows QoL before any

Table 4. Factors associated with Quality of Life (Physical Function Score)

Variable	Physical function score		Univariate Odds ratio(95%CI)	Adjusted Odds ratio(95%CI)
	≤Median n (%)	>Median n (%)		
Age (in years)				
≥60	42 (97.7)	1 (2.3)	92.8 (11.9 – 725.4)*	113.9 (14.3 – 910.5)*
46 – 59	61 (57.5)	45 (42.5)	3.0 (1.5 – 5.8)*	2.7 (1.3 - 5.3)*
≤ 45	19 (31.1)	42 (68.9)	1	1
Literacy Status				
Not literate	101 (60.5)	66 (39.5)	1.6 (0.8 - 3.1)	-
Literate	21 (48.8)	22 (51.2)	1	
Area of Residence				
Urban	35 (62.5)	21 (37.5)	1.3 (0.7 – 2.4)	-
Rural	87 (56.5)	67 (43.5)	1	
Financial Dependence for livelihood				
Yes	94 (59.5)	64 (40.5)	1.3 (0.7 – 2.4)	-
No	28 (53.8)	24 (46.2)	1	
Any Health Insurance				
No	107 (56.0)	84 (44.0)	0.3 (0.1 – 1.1)	-
Yes	15 (78.9)	4 (21.1)	1	
Clinical Staging of the disease				
Late-stage (IIIA+ + IV)	72 (69.2)	32 (30.8)	2.5 (1.4 – 4.4)*	3.3 (1.7 - 6.4)*
Early-stage (IIA + IIB)	50 (47.2)	56 (52.8)	1	1

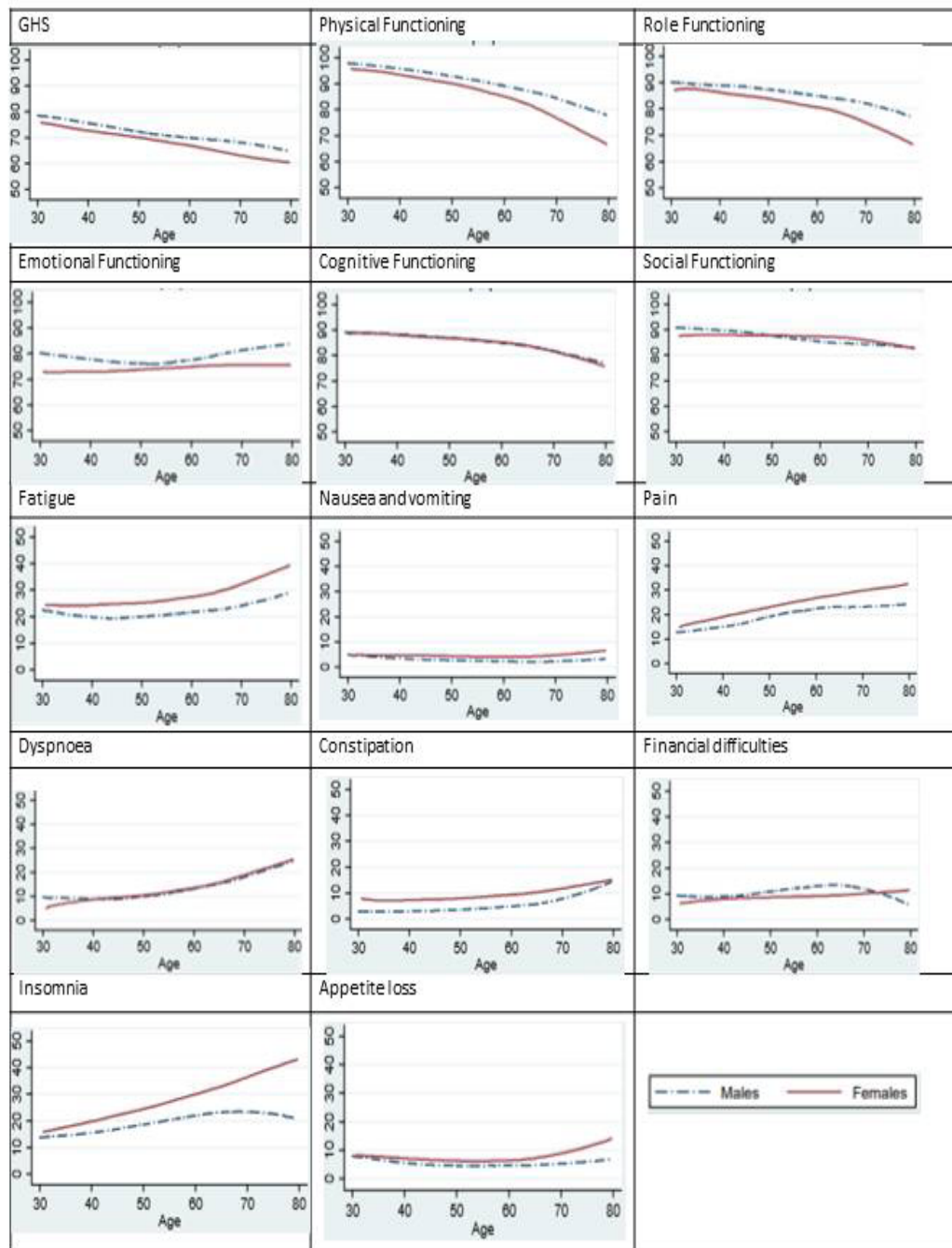


Figure 1. EORT QLQ-C30 Reference Values for General Population-2008

cancer-directed treatment had deteriorated compared with reference scores (EORTC) for those with any cancer 80 and 83 points. Other studies from India had similar findings (Damodar1 et al., 2014; Nayak et al., 2017; “Quality of Life in Cervical Cancer Patients in India,” n.d.). Our study findings showed a lower score on functional capacity on physical, role, and emotional score compared to normal individuals shown by the studies (Prasongvej et al., 2017; Scott et al., 2008) indicating the poor QoL.

The symptom scale result showed a higher score in pain (83.3) and fatigue (77.8) score among cervical cancer patients compared with reference scores (EORTC) for normal females (31 and 40) and those with any cancer (17.3 and 33.3) indicating severe symptoms of cervical cancer or indicating low QoL in the cervical cancer patient.

Other studies also had similar findings on pain and fatigue scores (Dahiya et al., 2016; Kumar et al., 2014). Regarding the score on a single-item scale, we found “constipation” and “financial concerns” had high scores indicating severe symptoms and other items to have low scores indicating fewer symptoms (this is better in results than here). These findings were in line with the studies looking at QoL prior to the treatment (Dahiya et al., 2016; Li et al., 2017; Prasongvej et al., 2017). Studies by (Bjelic-Radisic et al., 2012; Dahiya et al., 2016; Rahman et al., 2017) have shown that the pain, fatigue, and financial concerns had worsened.

Our study reports poor global health status, poor physical function, and high pain symptoms in women who were ≥ 60 years of age in the late clinical stage

Table 5. Factors associated with Quality of Life (Pain Symptom Score)

Variable	Pain symptom score		Univariate Odds ratio(95%CI) Add adjusted as well, at least age-adjusted	Adjusted Odds ratio (95%CI)
	>Median n (%)	≤Median n (%)		
Age (in years)				
≥60	39 (90.7)	4 (9.3)	1.7 (0.5 – 5.9)	-
46 – 59	95 (89.6)	11 (10.4)	1.5 (0.6 – 3.8)	-
≤ 45	52 (85.2)	9 (14.8)	1	-
Literacy Status				
Not literate	150 (89.8)	17 (10.2)	1.7 (0.7 - 4.5)	-
Literate	36 (83.7)	7 (16.3)	1	-
Area of Residence				
Rural	137 (89.0)	17 (11.0)	1.2 (0.5 – 2.9)	-
Urban	49 (87.5)	7 (12.5)	1	-
Financial Dependence for livelihood				
Yes	138 (87.3)	20 (12.7)	0.6 (0.2 – 1.8)	-
No	48 (92.3)	4 (7.7)	1	-
Any Health Insurance				
No	169 (88.5)	22 (11.5)	0.9 (0.2 – 4.2)	-
Yes	17 (89.5)	2 (10.5)	1	-
Clinical Staging of the disease*				
Late stage (IIIA+ + IV)	86 (81.1)	20 (18.9)	5.8 (1.9 – 17.7)*	5.8 (1.9 - 17.7)*
Early-stage (IIA + IIB)	100 (96.2)	4 (3.8)	1	1

of the disease. A similar observation was reported by another study (Rahman et al., 2017). A study by (Khalil et al., 2015), revealed that the tumor stage was one of the predictors of QoL. The reason for this would be that older cervical cancer patients face age-related changes and comorbidities. The findings in our study underline the importance of age during the planning of treatment.

Strengths

The study was conducted in a population-based cancer registry (PBCR) where the data are included in International Agency for Research on Cancer (IARC) and the data collection procedure involves standard quality control measures. The study was carried out in a population and hospital-based cancer registry where the majority of cervical cancer patients in the region of Karnataka state, south India seek care. Our study included only patients who were diagnosed with clinical and histopathological criteria. The information on QoL was obtained using a validated questionnaire developed by the EORTC. Information pertaining to demographic data and histological diagnosis was obtained from case sheets. Half the proportion of the patient load reporting for cervical cancer during the study period was considered for the study. Our study comprised all age groups and all clinical stages of the disease.

Limitations

There were more than half of cervical cancer patients aged ≥60 years and not included in the study. Also, the majority of patients reported here were not covered by any health insurance, were from the rural population, not

literate, and dependent on livelihood which could bias the result. Patients who avail of the services at the present study site may differ from those who use private cancer care centre in terms of socio-demographic and clinical stage. Therefore, the results are not generalizable to all the cervical cancer patients of the area.

In conclusion, cervical cancer patients had poor global health status, emotional and social functional health compared to the reference score for all females with all cancer and the normal females. Advanced stage of cancer and older age were found to have a significant association with QoL. These findings reiterate the need for ensuring appropriate services prior to cancer-directed treatment.

Author Contribution Statement

Shivaraj Nallur Somanna: Concept and Design, Data Acquisition, Analysis and Interpretation, Drafting of Manuscript, Statistical Analysis, Administrative, technical and material support, Study Supervision, Critical revision of the manuscript; Nandakumar Bidare Sastry: Concept and Design, Analysis and Interpretation, Drafting of Manuscript, Critical revision of the manuscript; Ramesh Cheluvaryaswamy: Data Acquisition, Analysis and Interpretation, Drafting of Manuscript, Administrative, technical and material support, Study Supervision, Critical revision of the manuscript; Nea Malila: Concept and Design, Analysis and Interpretation, Drafting of Manuscript, Administrative, technical and material support, Study Supervision, Critical revision of the manuscript

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Approval

The scientific clearance was obtained from Kidwai Memorial Institute of Oncology, Regional centre for cancer research and treatment, Bangalore, India.

Ethical Declaration

The ethical clearance was obtained from Kidwai Memorial Institute of Oncology, Regional centre for cancer research and treatment, Bangalore, India.

Conflict of interest

The authors report no conflicts of interest in this study and no financial support from any organization.

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