

ROLE OF NUTRITIONAL STATUS ON QUALITY OF LIFE OF BREAST CANCER PATIENTSDeepali Srivastava*¹, S. P. Singh², Ravi Shankar³ and H. S. Shukla⁴¹Research Scholar, Institute of Medical Sciences, Banaras Hindu University, Varanasi.²Professor, Institute of Medical Sciences, Banaras Hindu University, Varanasi.³Associate Professor, Department of Community Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi.⁴Ex-Professor, Department of Surgical Oncology, Institute of Medical Sciences, Banaras Hindu University, Varanasi.***Corresponding Author: Deepali Srivastava**

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ABSTRACT

Breast cancer represents about 12% of all new cancer cases and 25% of all cancers in women worldwide. This study aimed to understand the role of nutritional status on quality of life of breast cancer patients. A cross-sectional study was conducted in Sir Sunderlal Hospital, BHU, Varanasi. Women aged ≥ 18 years, who were diagnosed breast cancer in the same hospital were invited to participate. Body weight, height, BMI (Body Mass Index) status & Quality of life using EORTC QLQ C-30 & Br-23 scale were evaluated. Descriptive statistics were used to assess the body mass index (BMI) and QoL profile of patients and nonparametric tests (Kruskal-Wallis Test) were employed for assessing the objective. Out of the total 172 respondents the mean age was 45.4 ± 10.38 years. Majorities (90.7%) were Hindu, more than three-fourth (80.8%) belonged to rural area and were married (83.7%). More than half (51.7%) were illiterate, 74.4% were home maker and 53.5% of the participants belong to lower class of socio-economic status. Regarding BMI, 12.2% of subjects were under nutrition, 29.6% normal or well nourished, 58.2% overweight and obese. BMI is positively correlated with global health status ($r=0.15$, $p=0.037$) of the subjects. The median underweight for global health status was 33, normal and overweight was 41. So, there is a significant association between global health status and nutritional status of study subjects. In conclusion a significant association between poorer nutritional status and impaired quality of life, in all domains, was confirmed in this study.

KEYWORDS: Body mass index, EORTC QLQ scale, socio-economic status, global health status.**INTRODUCTION**

Breast cancer is the most common cancer in women worldwide, with nearly 1.7 million new cases diagnosed in 2012. This represents about 12% of all new cancer cases and 25% of all cancers in women worldwide.^[1] According to American Cancer Society, about 1.3 million women are diagnosed with breast cancer annually worldwide. Asia has experienced a higher rate of breast cancer than USA and Europe.^[2] Patients with cancer often suffer from malnutrition due to several factors related to the localization of the tumor, the disease stage, the presence of symptoms (e.g.- pain, vomiting, constipation) and type of anti-cancer treatment.^[3] The evaluation of nutritional status should include an assessment of quality of life (QOL) in order to optimize nutritional treatment for patients' individual requirement.^[4] Breast cancer patients experience physical symptoms and psychosocial distress that adversely affect their QOL. Thus, nutrition plays an important role in maintaining better quality of life among cancer patients. Within this framework, the present study intended to

understand the role of nutritional status on quality of life of breast cancer patients.

MATERIALS AND METHODS**Study Design and Sample Selection**

A cross sectional study was conducted in the OPD of surgical oncology, Sir Sunderlal Hospital, BHU on 172 breast cancer patients registered for the treatment from March 2014 to October 2017. Sample size was based on prevalence of under-nutrition in cancer patients (56.0%)^[5], considering relative precision of 8% and 10% non-response rate. Patients who were too sick to participate in the study were excluded from the study.

Study subjects and Ethical Issue

Patients aged 18 years and more, suffering from breast cancer, attending OPD on the specific days, diagnosis confirmed in Sir SunderLal hospital, BHU and suffering with any stage of disease were included in the study. This study was approved by Institute Ethical Committee, Institute of Medical Science, Banaras Hindu University.

Before the initiation of the data collection, informed consent was obtained from all the subjects.

Measurement of Variables

Data collection tools used were demographic proforma to collect demographic data i.e. age, religion, residence, marital status, type of family, education, occupation and per capita income, etc.

Anthropometric measurements

Height was measured by using a non-stretchable measuring tape fixed on a wall with a precision of 0.5 cm. The body weight of the study subjects was measured using a portable weighing scale with a precision of 100 gm, calibrated against a level balance. Body mass index (BMI) was calculated as weight (kilograms) divided by height (meters) squared. The WHO classification of BMI was adopted as underweight if BMI was <18.50, normal weight if BMI was 18.5- 24.9kg/m², overweight if BMI was 25- 29.9kg/m² and obese if BMI was >30kg/m² (WHO, 2004).^[6]

Quality of life

Patients QOL was assessed using the European Organization for Research and Treatment of Cancer Quality of life Questionnaire (EORTC QLQ-C30), a core questionnaire and QLQ-BR 23 as breast cancer module.

The EORTC QoL version 3 was composed of 30 items, which entailed five functional scales, three symptoms scales, six single item scales and one global quality of life scale. Each item was scored on a 4-point scale, with a score of 1 for “not at all” to a score of 4 “very much” except for the last 2 questions for the global QoL scale, which were scored on a 7-point scale ranging from 1 “very poor” to 7 “excellent”. The module BR-23 comprised of 23 questions designed for quantifying QOL of breast cancer patients, including four functional scales and four symptom scales.^[7] The raw scores were linearly transformed to obtain standard scores in the range of 0-100 for each of the scales and single items. A high scale score represented a higher response level. Thus, a high score for a functional scale and global health status reflected a high/ better QoL. Meanwhile, a high level of symptomatology/problems was presented by a low QoL.

Statistical Analysis

Data was coded and was entered into the MS Excel. For the analysis of data Statistical Package of Social Science (SPSS 21.00 Trial Version) was used. Descriptive statistics were used to assess the body mass index (BMI) and QoL profile of patients. Therefore, in assessing the objectives, nonparametric tests (Kruskal-Wallis Test) were also employed.

RESULTS AND DISCUSSION

Table 1: Patient Demographic and Anthropometry Measurement Characteristics of female breast cancer patients.

Characteristics	Category	Frequency (n=172)	Percentage
Age (in yrs)	Below 40	44	25.6
	40-59	103	59.9
	60-75	25	14.5
	Mean ± SD Range	45.4±10.38 24- 75	
Religion	Hindu	156	90.7
	Muslim	16	9.3
Residence	Urban	33	19.2
	Rural	139	80.8
Marital Status	Currently Married	145	83.7
	Others	27	16.3
Type of worker	Sedentary	138	80.2
	Moderate	34	19.8
Type of family	Nuclear	86	50.0
	Joint	86	50.0
Education	Illiterate	89	51.7
	Primary school	25	14.5
	High school / Secondary	47	27.3
	Higher	11	06.4
Occupation	Farming	18	10.5
	House-maker	128	74.4
	Daily wages/ Labor	19	11.0
	Service (Pvt. /Govt.)	07	04.1
Socio-economic Status	Upper Class	5	2.9
	Upper Middle Class	12	7.0
	Middle Class	15	8.7
	Lower Middle Class	48	27.9
	Lower class	92	53.5

Nutritional status	Grade III under nutrition	6	3.5
	Grade II under nutrition	5	2.9
	Grade I under nutrition	10	5.8
	Normal	51	29.6
	Overweight	28	16.3
	Pre- obese Type I obese	55 17	32.0 9.9

Out of the total 172 respondents, more than half (59.9%) of them were in the age group of 40-59 years (Table 1). The mean age of the respondents was 45.4 ± 10.4 yrs ranging from 24 to 75 years. Majorities (90.7%) of women were Hindus and rests (9.3%) were Muslims. More than three-fourth (80.8%) belonged to rural area and 19.2% belonged to urban area. More than four fifths of women (83.7%) were married and rest of them (16.3%) were widower, divorcee or separated. 80.2% of respondents were sedentary worker and 19.8% were moderate worker. Equal number of women (each 50%) belonged to nuclear and joint families. In the term of literacy, more than half (51.7%) were illiterate and 48.3% were literate, out of which, 27.3% were educated up to secondary or high school, 14.6% were primary educated and only 6.4% were graduates and post-

graduates. As far as occupation of women are concerned, it was found that 74.4% were home-makers, 10.5% were farmers, 11.0% were daily wagger or laborer and only 4.1% were engaged in govt. or private service. It was found that more than half (53.5%) of the participants belong to lower class of socio-economic status followed by lower middle (27.9%), middle (8.7%), upper middle (7.0%) and upper class (2.9%). BMI was calculated using the standard formula (wt. in kg divided by ht. in m^2). Regarding BMI, 12.2% of subjects were under nutrition in which 3.5% were in grade III, 2.9% grade II & 5.8% in grade I under nutrition, 29.6% normal or well nourished, 16.3% overweight and 41.9% obese (Table 7). Another study shows that almost half of the subjects had a BMI >27.3 and about one third had a BMI >30 .^[8]

Table 2: Correlation between different subscale scores of QLQ (C-30 & Br-23) and BMI of study subjects.

Different subscales of QLQ	Correlation	
	Correlation Coefficient (r)	p-value
Functional score	0.25	0.001
Physical functioning	0.24	0.001
Role functioning	0.22	0.003
Emotional functioning	0.20	0.009
Cognitive functional	0.12	0.091
Social functioning	0.19	0.012
Symptom Score	-0.21	0.005
Fatigue	-0.15	0.045
Nausea & vomiting	-0.18	0.014
Pain	-0.18	0.015
Dyspnea	-0.02	0.710
Insomnia	-0.11	0.139
Appetite loss	-0.16	0.032
Constipation	-0.14	0.058
Diarrhea	-0.08	0.262
Financial difficulties	-0.17	0.023
Br_Functional score	0.17	0.019
Body image	0.12	0.107
Sexual functioning	0.13	0.071
Sexual enjoyment	0.12	0.105
Future perspective	0.19	0.013
Br_Symptoms score	-0.18	0.013
Systematic therapy side effect	-0.26	0.000
Breast symptoms	-0.06	0.377
Arm symptoms	-0.08	0.261
Upset by hair loss	-0.05	0.489
Global health status	0.15	0.037

Table 2 shows bivariate correlation between BMI of study subjects and each subscales of Quality of life. BMI is positively correlated with physical functioning ($r=0.24, p=0.001$), role functioning ($r=0.22, p=0.003$),

emotional functioning ($r=0.20, p=0.009$), social functioning ($r=0.19, p=0.012$) and future perspective ($r=0.019, p=0.013$) but negatively correlated with fatigue ($r=-0.15, p=0.045$), nausea & vomiting ($r=-0.18,$

$p=0.014$), pain ($r=-0.18$, $p=0.015$), appetite loss ($r=-0.16$, $p=0.032$), financial difficulties ($r=-0.17$, $p=0.023$) and systematic therapy side effect ($r=-0.26$, $p=0.000$). BMI is also positively correlated with global health status ($r=0.15$, $p=0.037$) of the subjects. Lua *et al.*(2012)

examining the relationship between BMI and HRQoL and it demonstrated positive correlations particularly in emotional and cognitive functioning but a negative correlation with fatigue.^[9]

Table-3. Median (IQR) of various QLQ (C-30 & Br 23) subscale scores according to nutritional status

Various QLQ subscales	Nutritional status(BMI)			p-value*
	Underweight	Normal	Overweight	
Functional score	26 (18-70)	53 (35-68)	57 (46-75)	0.002
Physical functioning	33 (10-76)	53 (33-73)	66 (46-80)	0.001
Role functioning	33 (33-66)	66 (33-83)	66 (66-100)	0.003
Emotional functioning	25 (4-66)	45 (33-66)	50 (33-66)	0.010
Cognitive functional	66 (33-91)	66 (50-83)	66 (66-100)	0.515
Social functioning	33(0-58)	33 (16-50)	50 (33-66)	0.006
Symptom Score	56 (24-65)	38 (26-55)	35 (23-48)	0.037
Fatigue	66 (38-88)	50 (25-66)	44 (33-66)	0.043
Nausea & vomiting	33 (0-41)	16 (0-50)	0 (0-33)	0.157
Pain	66 (25-91)	50 (33-66)	50 (16-50)	0.053
Dyspnea	33 (0-66)	33 (0-66)	0 (0-66)	0.405
Insomnia	33 (0-100)	33 (0-66)	33 (0-66)	0.445
Appetite loss	66 (0-100)	33 (0-66)	33 (0-66)	0.196
Constipation	33 (0-66)	0 (0-66)	0 (0-33)	0.208
Diarrhea	0 (0-16)	0 (0-33)	0 (0-0)	0.383
Financial difficulties	66 (0-100)	66 (66-100)	66 (33-100)	0.003
Br_Functional score	70 (58-85)	68 (54-90)	79 (62-91)	0.159
Body image	66 (41-100)	58 (33-100)	66 (50-100)	0.427
Sexual functioning	100 (100-100)	100 (100-100)	100 (100-100)	0.799
Sexual enjoyment	100 (100-100)	100 (100-100)	100(100-100)	0.529
Future perspective	33 (0-33)	33 (0-66)	33 (33-66)	0.072
Br_Symptoms score	51 (18-75)	37 (22-60)	35 (22-48)	0.205
Systematic therapy side effect	66 (30-80)	54 (33-76)	38 (23-52)	0.003
Breast symptoms				
Arm symptoms	25 (8-66)	16 (2-50)	25 (8-41)	0.685
Upset by hair loss	44 (5-83)	22 (0-55)	33 (11-55)	0.400
	33 (0-66)	33 (0-100)	33 (0-66)	0.367
Global health status	33 (20-50)	41 (27-41)	41 (33-58)	0.005

*Kruskal Wallis test

Table 3 illustrates median scores of various QOL subscales according to nutritional status. The median underweight for functional score was 26, normal was 53 and overweight was 57. There was significantly association between subscales of functional score (physical functioning, $p=0.001$; role functioning, $p=0.003$; emotional functioning, $p=0.010$ and social functioning, $p=0.006$) and nutritional status. The median underweight for symptom score was 56, normal 38 and overweight 35, which showed associated between symptom score and nutritional status. Additionally, when comparing this nutritional status with breast functional and symptom scores, the only subscale with significant difference was systematic therapy side effect, which was highest in patients with underweight BMI 66 compared to those who were normal 54 and overweight 38. The median underweight for global health status was 33, normal and overweight was 41. So, there is a significant association between global health status and nutritional status of study subjects. Another study shows that Cancer related fatigue is the most prevalent cancer symptom,

which was reported by about 50- 90% of cancer patients.^[10]

CONCLUSION

Global quality of life, physical, role, emotional and social functioning, cancer fatigue, financial difficulties and systematic therapy side effect were statistically different with BMI groups. In conclusion a significant association between poorer nutritional status and impaired quality of life, in all domains, was confirmed in this study.

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