

## RESEARCH ARTICLE

# Quality of Life among Breast Cancer Patients In Malaysia

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### Abstract

**Background:** Among the factors reported to determine the quality of life of breast cancer patients are socio-demographic background, clinical stage, type of treatment received, and the duration since diagnosis. **Objective:** The objective of this study was to determine the quality of life (QOL) scores among breast cancer patients at a Malaysian public hospital. **Materials and Methods:** This cross-sectional study of breast cancer patients was conducted between March to June 2013. QOL scores were determined using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and its breast cancer supplementary measure (QLQ-BR23). Both the QLQ-C30 and QLQ-BR23 assess items from functional and symptom scales. The QLQ-C30 in addition also measures the Global Health Status (GHS). Systematic random sampling was used to recruit patients. **Results:** 223 breast cancer patients were recruited with a response rate of 92.1%. The mean age of the patients was 52.4 years (95% CI = 51.0, 53.7, SD=10.3). Majority of respondents are Malays (60.5%), followed by Chinese (19.3%), Indians (18.4%), and others (1.8%). More than 50% of respondents are at stage III and stage IV of malignancy. The mean Global Health Status was 65.7 (SD = 21.4). From the QLQ-C30, the mean score in the functioning scale was highest for 'cognitive functioning' (84.1, SD=18.0), while the mean score in the symptom scale was highest for 'financial difficulties' (40.1, SD=31.6). From the QLQ-BR23, the mean score for functioning scale was highest for 'body image' (80.0, SD=24.6) while the mean score in the symptom scale was highest for 'upset by hair loss' (36.2, SD=29.4). Two significant predictors for Global Health Status were age and employment. The predictors explained 10.6% of the variation of global health status ( $R^2=0.106$ ). **Conclusions:** Age and employment were found to be significant predictors for Global Health Status (GHS). The Quality of Life among breast cancer patients reflected by the GHS improves as age and employment increases.

**Keywords:** EORTC - quality of life - breast cancer - Malaysia

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### Introduction

An estimated 1.67 million new cases of breast cancer were diagnosed globally in 2012 alone (J. Ferlay et al., 2015). This accounts for 11.9% of all new cancer cases recorded, and ranks 2nd in the overall incidence of cancers worldwide. The breast cancer age standardized mortality rate globally was 12.9 per 100,000 population in the year 2012 (Gertrude et al., 2014).

In Malaysia, breast cancer is the most frequently reported malignancy, followed by colorectal tumours and lung cancer (Lim and Azura, 2008). The age pattern for carcinoma of breast showed a peak age-standardized rate (ASR) at the age group of 50-59 years and the cumulative life-time risk of developing this disease is 1 in 16 for Chinese women, 1 in 17 for Indian women, and 1 in 28 for Malay women (O Zainal et al., 2007)

Interest in assessing the quality of life of breast cancer patients in recent decades has increased partly due to the

increase in the incidence of breast cancer cases globally (Perry et al., 2007). The European Organisation for Research and Treatment of Cancer questionnaires for breast cancer consisting of EORTC-QLQ-C30 and the QLQ-BR-23 has been validated to be used among breast cancer patients in Malaysia (Aaronson et al., 1993; Yusoff, 2010; Yusoff, 2012).

Currently, there are limited data available on quality of life among breast cancer patients in Malaysia. This study was conducted to determine the Quality of Life scores among breast cancer patients at a Malaysian public hospital.

### Materials and Methods

A cross sectional study was conducted between March and June 2013 with a total of 223 female breast cancer patients recruited, using systematic random sampling. Ethics approval to conduct this study was obtained from

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the Ministry of Health. The inclusion criteria for this study were patients with confirmed diagnosis of breast cancer, who were 18 years old and older. Male breast cancer patients were excluded from this study. Written informed consent was obtained from the patients. Socio-demographic details, diagnosis, and disease stage were obtained from the case report form to ensure the authenticity of patient's information.

In this research, the operational definition for the term 'treatment' under the 'current clinical management' heading refers to patients who were undergoing chemotherapy or radiotherapy during the study period. The term 'follow-up post-treatment' refers to patients who were either on targeted therapy, hormonal therapy, or on routine clinic appointment during the study period.

Breast cancer patients attending the oncology clinic, daycare centre, as well as in-patients from oncology wards who consented to participate in this study were each given the EORTC self-administered questionnaire. This questionnaire consists of the QLQ C-30 module, and the QLQ-BR-23 module. There are four response scales for most items; from 1 (not at all) to 4 (very much) except for global health status which employed a seven point response scale (Fayers et al., 2001).

The QLQ C-30 consists of 30 questions, which assesses global health, functions, symptoms and financial implications of the disease. The QLQ-BR23 consists of 23 questions of functional scale and symptom scale. The functional scale evaluates body image, sexual functioning, sexual enjoyment, and future perspective, while the symptom scale evaluates systemic therapy side effects, breast symptoms, arm symptoms, and being upset by hair loss (Aaronson et al., 1993).

All raw data were linearly transformed to give a score between 0-100. A high score for a functional scale represents a healthy level of functioning whereas a high score for a symptom scale or item represents a high level of symptomatology or problems. High scores on the global and functional scales indicate good QOL, on the symptom scales low scores represent less intense symptom experience, hence higher QOL. Low scores on the global and functional scales, and high scores from the symptom scales indicate poor QOL.

SPSS version 21 was used to analyse the data using the Level of significance was set at an alpha of 0.05. Descriptive statistics were used to describe the results for socio-demographic characteristics of the respondents and scales in EORTC Questionnaire.

Normality tests were carried out for Global Health Status (GHS), Functioning Scale, and Symptom Scale. Normally distributed data were analysed with parametric tests namely independent t-test and one way ANOVA. Data which were not normally distributed were analysed with non-parametric tests namely Mann Whitney U test and Kruskal Wallis tests. These tests were performed to determine if differences in the mean score of QOL across socio-demographic and clinical parameters of the patient were significant. Post-hoc test with Gabriel and correction for Type I error was performed to analyse pair-wise comparison between groups.

## Results

A total of 242 female breast cancer patients were approached in the oncology clinic, oncology wards, and oncology day care centre during the study period. Of these patients, 7 patients were not keen to participate, and 12 patients' medical records were unable to be traced, 223 were available for the study giving a response rate of 92.1%.

Table 1 depicts the socio-demographic characteristics of the respondents. The mean age of the participants in this study were 52.4 years (SD=10.3). Majority of patients fall in the age group between 50-54 years old (20.2%), and predominantly post-menopausal (64.1%). Among the participants, the youngest respondent was 23 years old, while the oldest respondent was 76 years old.

Majority were of Malay ethnicity (60.5%), followed by Chinese (19.3%), Indians (18.4%), and others (1.8%). Married patients made up 78.9% of the total respondents. Majority of respondents were unemployed (74.9%), while employment made up 25.1% of these patients. At the time of study, majority of these 223 patients are at stage III breast cancer (38.6%), followed by stage II (37.7%), stage IV (13.5%), and stage I (10.3%).

The mean period of time since diagnosis among the follow-up patients was 3 years, with the longest period of follow-up by a single breast cancer survivor was 25 years. Patients in this cross-sectional study predominantly underwent mastectomy with axillary clearance (77.1%), followed by wide local excision with axillary clearance (9.9%). The distribution of respondents in this study according to the mode of treatment is illustrated in Figure 1.

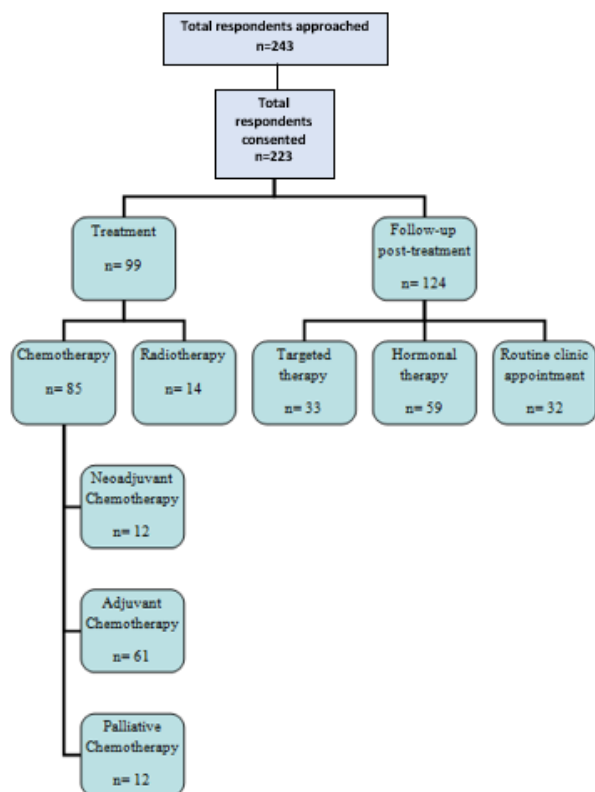


Figure 1. Distribution of Respondents

**Table 1 (A). Socio-demographic Characteristics of Respondents**

Characteristics	Number	Percentage (%)	N
<b>Age</b>			
20 - less than 30	4	1.7	
30 - less than 40	23	10.3	
40 - less than 50	55	24.7	
50 - less than 60	86	38.6	
60 - less than 70	43	19.3	
70 - less than 80	12	5.4	223
<b>Ethnicity</b>			
Malay	135	60.5	
Chinese	43	19.3	
Indian	41	18.4	
Others	4	1.8	223
<b>Highest level of education</b>			
Never Attended Formal School	8	3.6	
Primary School	79	35.4	
Secondary School	106	47.5	
Certificate/Diploma	21	9.4	
Degree	6	2.7	
Others	3	1.3	223
<b>Marital status</b>			
Single	11	4.9	
Married	176	78.9	
Divorced	5	2.2	
Widow	31	13.9	223
<b>Employment status</b>			
Unemployed/ Pensioner/ Retired	167	74.9	
Employed	56	25.1	223
<b>Monthly income of patient</b>			
Nil	156	70	
Less than RM1000	14	6.3	
RM1000 - less than RM2000	17	7.6	
RM2000 - less than RM3000	25	11.2	
Above RM3000	11	4.9	223
<b>Stage of disease</b>			
Stage I	23	10.3	
Stage II	84	37.7	
Stage III	86	38.6	
Stage IV	30	13.5	223
<b>Current Clinical Management</b>			
Chemotherapy (Treatment)	85	38.1	
Radiotherapy (Treatment)	14	6.3	
Hormonal Therapy (Post-treatment follow-up)	59	26.5	
Targeted Therapy (Post-treatment follow-up)	33	14.8	
Routine Clinic (Post-treatment follow-up)	32	14.3	223
<b>Time since diagnosis</b>			
< 5 years	203	91	
5 years to < 10 years	15	6.7	
10 years to < 15 years	4	1.8	
15 years to < 20 years	0	0	
≥ 20 years	1	0.5	223
<b>Surgical intervention</b>			
No Surgical Intervention	21	9.4	
Mastectomy	180	80.7	
Breast Conserving Surgery	22	9.9	223

Table 2 shows the comparison of Quality of life scores of the domains in European Organization for Research and Treatment of Cancer (EORTC) questionnaire from the study. The mean Global Health Status from the 223 respondents was 65.7(SD=21.4). From the QLQ-C30 questionnaire, the mean score in the functioning scale was highest in the cognitive functioning (84.1,SD=18.0), while , the mean score in the symptom scale was highest in the financial difficulties with a score of 40.1 (SD=31.6). From the QLQ-BR23 questionnaire, the mean score in the functioning scale was highest in the body image (80.0, SD=24.6) while the mean score in the symptom scale was highest in the upset by hair loss (36.2,SD=29.4).

Tables 3A, 3B, 3C shows the mean QOL scores by age, menopausal status, ethnicity, marital status, employment status, current clinical management, stage of disease, and surgical intervention. From the variables studied, respondents with positive employment status reported significantly better mean QOL scores.

Better quality of life was observed among breast cancer patients older than 55 years, compared to patients who are 55 years and younger. Significant difference among this two groups of patients were present in the functioning scales (body image, sexual functioning, future perspective), and symptom scales (nausea/vomiting, constipation, diarrhea, systemic therapy side effects, breast

**Table 2. Quality of life (QOL) Scores for All Respondents****2(A) QLQ-C30 Questionnaire**

EORTC Item	Mean score	(SD)	Median
Global Health Status	65.7	21.4	66.7
<b>Functional Scales</b>			
Physical functioning	81.7	17.6	86.7
Role functioning	82.3	25.2	100
Emotional functioning	78.5	19.9	83.3
Cognitive functioning	84.1	18	83.3
Social functioning	81.6	21.8	83.3
<b>Symptom Scales</b>			
Fatigue	28.9	19.9	33.3
Nausea / Vomiting	11.7	18.6	0
Diarrhoea	7.7	17.3	16.7
Financial difficulties	40.1	31.6	33.3
Pain	18.8	20.3	16.7
Dyspnoea	10.01	18.6	0
Insomnia	21.3	27.1	0
Appetite loss	18.98	25.6	0
Constipation	9.9	21.5	0

**2(B) QLQ-BR-23 Questionnaire**

EORTC Item	Mean score	(SD)	Median
<b>Functional Scales</b>			
Body Image	80	24.6	83.3
Sexual functioning	14.3	23.1	0
Future perspective	59.8	32.6	66.7
Sexual enjoyment	40.9	28.8	33.3
<b>Symptom Scales</b>			
Systemic therapy side effects	22.6	20.5	14.3
Breast symptoms	11.4	14.6	8.3
Arm symptoms	17.6	18.7	11.1
Upset by hair loss	36.2	29.4	33.3

**Table 3(A). Quality of life (QOL) scores by Age, Menopausal Status, and Ethnicity**

QOL Items	Age				p	Menopausal Status				p	Ethnicity						p
	< 55 Years		≥ 55 Years			Pre-Menopausal	Post-Menopausal	Malay	Chinese		Indian						
	Mean	SD	Mean	SD					Mean		SD	Mean	SD	Mean	SD		
QLQ-C-30 Questionnaire																	
Global Health Status	65	26.7	66.7	21.8	0.538	66.5	19.7	65.3	22.4	0.668	67.3	21.5	67.8	18	60	23.5	0.123
Functional Scales																	
Physical functioning	81.4	86.7	82.2	18.3	0.72	80.3	16.5	82.5	18.2	0.134	83.1	17.4	82.8	14.9	77.1	20.4	0.24
Role functioning	80.8	100	84.2	25.2	0.326	80.4	25.7	83.3	26.1	0.097	80	27.5	90.7	17.9	81.7	22.9	0.032
Emotional functioning	76.5	75	81.2	19.5	0.084	77.1	19.9	79.3	20	0.31	78.2	20.5	83.3	15.7	75	21.8	0.189
Cognitive functioning	82.9	83.3	85.6	16.7	0.278	82.5	19.1	85	17.4	0.414	85.3	17.6	84.5	18.3	80.5	19.3	0.326
Social functioning	79.1	83.3	84.9	20.4	0.05	76.9	23	84.3	20.6	0.014	81.6	22.3	82.6	20.6	82.1	20.9	0.992
Symptom Scales																	
Fatigue	31.1	33.3	25.9	19.1	0.052	33.5	20.2	26.3	19.3	0.012	29.2	19.3	24.3	20.1	31.4	20.8	0.114
Nausea/Vomiting	14	0	8.7	16.2	0.028	14.2	18.8	10.4	18.4	0.052	11.6	16.9	6.6	13.2	15.9	24.7	0.135
Pain	20.9	16.7	16.1	17.5	0.076	23.3	22.3	16.3	18.7	0.01	19.9	22.3	12.8	14.9	21.5	17.6	0.068
Dyspnoea	11.5	0	8	15.9	0.143	12.1	20.7	8.9	17.2	0.249	8.6	17.3	8.5	19.4	16.3	21.2	0.033
Insomnia	23.1	0	19.1	25.5	0.277	28.3	28.6	17.5	25.6	0.002	20.7	27.2	8.5	26.4	24.4	27.9	0.674
Appetite loss	19.9	25.6	17.7	25.6	0.519	22.9	25.2	16.8	25.6	0.026	19.7	23.8	20.1	21	24.4	31.6	0.009
Constipation	14.1	24.7	4.2	14.7	0.001	16.3	25.4	6.3	18.1	0.001	11.3	22.4	9.3	21	4.9	17.6	0.127
Diarrhoea	9.7	19.7	5.2	13.1	0.042	10.8	21.7	6.1	14.1	0.153	8.4	18.1	7.8	19	5.7	12.7	0.769
Financial difficulties	41.5	31.9	38.2	31.3	0.445	40.4	33.8	39.9	30.5	0.978	40	31.5	34.9	30	46.3	34.1	0.285
BR-23 Questionnaire																	
Functional Scales																	
Body Image	74	83.3	85.6	21	0.001	70.3	27	80.9	21.7	0.001	77.3	26.6	86	17.3	78.3	23.6	0.194
Sexual functioning	22	0	4.2	11.8	0.001	29	26.5	6.2	15.9	0.001	19.6	25.7	7.8	16.4	3.3	11.9	0.001
+Sexual enjoyment	43.6	33.3	33.3	15.7	0.11	43.7	27	38.3	19.6	0.47	42.7	26.1	38.1	12.6	55.6	19.2	0.484
Future perspective	52.8	66.7	69.1	31.4	0.001	50.8	31.8	64.8	32.1	0.001	56.3	31.9	72.9	29.3	58.5	36.3	0.012
Symptom Scales																	
**STSE	26.1	21.1	18.1	18.8	0.004	28.8	20.7	19.2	19.6	0.001	23.1	20.3	18.5	20.9	24	20.7	0.187
Breast symptoms	14	16.9	8	9.8	0.001	16.1	18.7	8.8	10.9	0.003	12.5	16.6	9.3	10.2	11	11.6	0.864
Arm symptoms	17.9	17.8	17.1	20	0.751	19.2	17.4	16.7	19.4	0.126	16.6	17.2	14	15.4	25.2	24.2	0.071
++Upset by hair loss	41.8	29.4	25.8	26.8	0.003	40.9	30.2	32.4	28.4	0.099	33.3	27.7	44.4	36.2	37.7	30.7	0.514

+ Sexual Enjoyment (n=62); ++Upset by hair loss (n=127); \*\*Systemic Therapy Side Effects

symptoms, upset by hair loss).

Comparison between premenopausal and post-menopausal breast cancer patients showed better quality of life among post-menopausal women. Significant difference was present in the functioning scale (social functioning, body image, sexual functioning, future perspective) and symptom scales (fatigue, pain, insomnia, appetite loss, constipation, systemic therapy side effects, and breast symptoms).

Quality of life was better among the Chinese breast cancer patients, compared to the Malay and Indian patients. Significant difference was reported in the functional scale (role functioning, sexual functioning, future perspective), and symptom scales (dyspnoea, appetite loss).

Better quality of life was also seen among women who are either single, divorced, or widowed compared to married women. Significant difference was seen in the functional scale (physical functioning, social functioning,

body image, sexual functioning, future perspective), and symptom scales (systemic therapy side effects, and upset by hair loss).

Breast cancer patients with an education level of primary school and lower had better quality of life compared to patients with an education level of secondary school and higher in the functioning scales (body image), and symptom scales (breast symptoms, upset by hair loss).

Patients who were employed had better quality of life than patients who were unemployed. Significant difference was seen in the Global Health Status (GHS), functioning scales (physical functioning, emotional functioning, sexual functioning), and symptom scales (financial difficulties).

Quality of life was also better among patients who were under follow-up, compared to patients on the treatment phase. Significant difference were found in functioning scale (physical functioning, role functioning,

**Table 3(B). Quality of Life (QOL) Scores by Marital Status, Employment Status, and Current Clinical Management**

QOL Items	Marital Status					Employment Status					Current Clinical Management				
	Single/Divorced/ Widow		Married		P	Unemployed		Employed		P	Treatment		Follow-up		P
	Mean	SD	Mean	SD		Mean	SD	Mean	SD		Mean	SD	Mean	SD	
QLQ-C-30 Questionnaire															
Global Health Status	66.7	19.2	65.5	22.1	0.775	62.7	21.3	72.6	20.2	0.001	64	21.9	67.1	21	0.275
Functional Scales															
Physical functioning	86.7	13.5	80.4	18.4	0.042	80	18.4	85.7	15.1	0.033	78.9	19.2	84	15.9	0.033
Role functioning	85.8	22	81.3	26	0.353	81.1	25.5	85.1	24.6	0.145	76.1	26.6	87.2	23	0.001
Emotional functioning	79.1	21.8	78.4	19.5	0.517	76.8	19.5	82.5	20.4	0.013	76.9	20.1	79.8	19.8	0.292
Cognitive functioning	87.2	17.1	83.2	18.2	0.156	83.5	18.5	85.3	16.8	0.632	80.6	19.2	86.8	16.6	0.011
Social functioning	87.6	17.9	80	22.5	0.03	80.8	21.8	83.6	21.6	0.246	78.8	22.8	83.9	20.7	0.083
Symptom Scales															
Fatigue	26	19	29.7	20.1	0.291	30.1	19.9	26.2	19.6	0.191	33.4	20.2	25.3	18.9	0.002
Nausea/Vomiting	11.3	22.3	11.8	17.6	0.2	12	19.4	11.2	16.5	0.813	17.5	20.5	7.1	15.5	0.001
Pain	16	18.7	19.6	20.7	0.245	18.5	19.9	19.7	21.3	0.674	24.9	21.1	14	18.3	0.001
Dyspnoea	9.2	18	10.2	18.8	0.721	9.4	17.2	11.4	21.4	0.692	12.1	19.9	8.3	17.3	0.13
Insomnia	17	23.9	22.3	27.9	0.403	21.6	27.8	20.9	25.8	0.984	27.9	28.5	16.1	25	0.001
Appetite loss	18.4	24.9	19.1	25.8	0.938	20.1	27.2	16.4	21.2	0.605	28.6	27.4	11.3	21.2	0.001
Constipation	9.2	23.8	10	20.9	0.379	10.3	22.6	9	18.9	0.967	14.8	24.3	5.9	18.1	0.002
Diarrhoea	5.7	16	8.3	17.6	0.23	7.7	17.3	18	17.5	0.947	11.4	20.8	4.8	13.2	0.004
Financial difficulties	44	30	39	32.2	0.359	43.2	30.8	32.8	32.6	0.021	41.1	33.6	39.2	30.1	0.669
BR-23 Questionnaire															
Functional Scales															
Body Image	88.3	14.3	76.5	26.1	0.01	80	23	76.9	27.9	0.805	73.1	24.1	83.7	24	0.001
Sexual functioning	3.9	13.6	17.1	24.3	0.001	12	21.6	20	25.5	0.006	20.9	25.2	9.1	19.7	0.001
+Sexual enjoyment	41.7	16.7	42	25.4	0.987	41	24.7	43.5	25.5	0.641	44.2	25.5	37.9	23.7	0.344
Future perspective	70.2	28	57	33.3	0.014	59.7	32.4	60.2	33.5	0.821	50.8	31.7	66.9	31.7	0.001
Symptom Scales															
**STSE	16.4	16.4	24.3	21.1	0.024	23	20.5	21.7	20.6	0.499	31.2	20.5	15.8	17.8	0.001
Breast symptoms	7.6	9.6	12.5	15.5	0.062	11.1	15.3	12.3	12.8	0.129	15.2	18.5	8.5	9.4	0.001
Arm symptoms	13.7	16.6	18.6	19.1	0.085	17.9	19.1	16.9	17.9	0.777	20.1	19.1	15.2	18.1	0.035
++Upset by hair loss	23.6	20.8	39.2	30.4	0.025	35.7	30.2	37.4	28.1	0.609	40.4	29.9	29.1	27.5	0.035

+ Sexual Enjoyment (n=62); ++Upset by hair loss (n=127); \*\*Systemic Therapy Side Effects

**Table 3(C). Quality of Life (QOL) Scores by Stage of Tumour, and Surgical Intervention**

QOL Items	Stage of Cancer					P	Surgical Intervention			P
	Stage I	Stage II	Stage III	Stage IV	No Surgery		Mastectomy	***BCS		
	Mean(SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)		
QLQ-C-30 Questionnaire										
Global Health Status	69.9 (23.4)	65.5 (19.8)	68.1 (19.0)	56.4 (28.3)	0.053	55.6 (23.3)	66.0 (21.3)	72.7 (17.9)	0.054	
Functional Scales										
Physical functioning	84.9 (17.7)	82.5 (15.8)	82.6 (16.7)	74.9 (23.5)	0.132	76.1 (25.0)	82.1 (16.7)	83.9 (15.8)	0.287	
Role functioning	92.0 (13.1)	81.3 (23.5)	86.2 (21.7)	66.1 (37.3)	0.001	75.4 (31.4)	83.1 (15.8)	81.8 (29.5)	0.412	
Emotional functioning	83.7 (20.8)	79.4 (16.6)	79.0 (19.1)	70.8 (27.7)	0.101	73.4 (23.8)	78.9 (19.3)	79.9 (20.8)	0.459	
Cognitive functioning	87.7 (18.3)	84.7 (16.6)	85.5 (17.7)	75.6 (20.9)	0.07	79.4 (19.7)	84.5 (17.7)	84.8 (19.2)	0.453	
Social functioning	89.1 (17.1)	81.0 (21.5)	83.7 (18.1)	71.7 (31.0)	0.019	77.0 (21.4)	81.9 (22.1)	83.3 (19.9)	0.571	
Symptom Scales										
Fatigue	19.3 (16.8)	29.0 (17.5)	27.6 (18.7)	39.6 (26.7)	0.002	38.6 (20.7)	28.0 (19.8)	26.8 (17.3)	0.059	
Nausea/Vomiting	2.2 (16.8)	11.1 (18.0)	13.4 (19.8)	16.1 (20.8)	0.036	20.6 (20.3)	11.4 (18.7)	6.1 (13.2)	0.031	
Pain	10.1 (13.0)	18.3 (15.4)	17.4 (20.1)	31.1 (28.9)	0.001	32.5 (24.4)	17.4 (19.2)	17.4 (20.1)	0.005	
Dyspnoea	10.1 (15.7)	10.3 (17.9)	8.5 (17.1)	13.3 (25.7)	0.677	17.5 (27.1)	9.8 (17.9)	4.5 (11.7)	0.07	
Insomnia	17.3 (33.1)	19.8 (17.9)	22.9 (26.7)	24.4 (30.2)	0.707	34.9 (30.7)	19.8 (26.5)	21.2 (33.4)	0.054	
Appetite loss	13.0 (31.4)	18.7 (22.8)	19.0 (25.3)	24.4 (28.9)	0.456	30.2 (29.6)	18.0 (24.5)	16.7 (28.6)	0.106	
Constipation	4.3 (15.3)	6.0 (16.5)	10.0 (19.8)	25.6 (33.5)	0.001	17.5 (27.1)	9.1 (20.8)	9.1 (21.0)	0.237	
Diarrhoea	2.9 (9.6)	7.1 (16.4)	8.9 (18.7)	10.0 (19.9)	0.425	6.3 (13.4)	7.6 (17.2)	10.6 (21.5)	0.689	
Financial difficulties	39.1 (34.3)	38.5 (33.3)	37.6 (30.2)	52.2 (27.2)	0.159	46.0 (26.8)	40.2 (32.2)	33.3 (30.9)	0.42	
BR-23 Questionnaire										
Functional Scales										
Body Image	86.2 (24.8)	75.9 (24.9)	84.0 (20.9)	67.8 (28.9)	0.004	71.0 (22.6)	79.7 (25.0)	80.7 (22.5)	0.293	
Sexual functioning	14.5 (20.9)	11.9 (20.8)	14.3 (24.2)	21.1 (26.6)	0.319	29.4 (29.8)	11.8 (20.9)	21.2 (26.8)	0.061	
+Sexual enjoyment	33.3 (25.6)	37.0 (19.4)	53.0 (24.5)	35.9 (28.7)	0.07	45.5 (30.8)	41.3 (23.1)	40.7 (27.8)	0.877	
Future perspective	72.5 (34.3)	56.0 (34.0)	63.6 (28.8)	50.0 (34.7)	0.036	46.0 (26.8)	61.5 (33.4)	59.1 (28.9)	0.12	
Symptom Scales										
**STSE	12.0 (20.5)	22.5 (19.6)	22.0 (18.7)	32.9 (23.6)	0.003	32.2 (20.7)	22.4 (20.9)	15.6 (12.7)	0.026	
Breast symptoms	8.7 (10.8)	11.0 (11.8)	10.6 (12.3)	17.2 (25.5)	0.114	25.0 (22.0)	10.1 (13.2)	9.5 (9.7)	0.001	
Arm symptoms	13.5 (21.2)	20.0 (20.9)	16.0 (16.2)	18.5 (16.7)	0.373	20.6 (15.8)	16.9 (18.4)	20.7 (23.3)	0.486	
++Upset by hair loss	40.0 (36.6)	34.5 (27.4)	39.4 (30.7)	33.3 (31.6)	0.807	39.2 (24.2)	37.4 (30.0)	22.2 (29.6)	0.218	

+ Sexual Enjoyment (n=62); ++Upset by hair loss (n=127); \*\*Systemic Therapy Side Effects; \*\*\*Breast Conserving Surgery



**Table 4. Predictors of Global Health Status by Using Multiple Linear Regression Model**

Variables	Beta	P value
Age	0.237	0.021
Breast Conserving Surgery	0.096	0.35
Chinese Ethnicity	0.164	0.103
Education Status	0.004	0.972
Employment	0.254	0.014
Income Level	0.227	0.363
Indian Ethnicity	-0.17	0.091
Years since diagnosis	0.088	0.383
Marital Status	0.177	0.258
Mastectomy	-0.096	0.35
Menopausal Status	-0.164	0.208
Post Treatment Management	-0.119	0.246
Stage 2 Disease	-0.108	0.288
Stage 3 Disease	0.101	0.319
Stage 4 Disease	0.01	0.919

**Table 5. Final Model of Predictors for Global Health Status**

Model	B <sup>1</sup>	SE	Beta <sup>2</sup>	t	p.
(Constant)	40.735	10.55		3.86	0
Employment	11.071	4.401	0.254	2.516	0.014
Age	0.445	0.19	0.237	2.347	0.021

<sup>1</sup>Unstandardized Coefficient; <sup>2</sup>Standardized Coefficient

cognitive functioning, body image, sexual functioning, future perspective), and symptom scales (fatigue, nausea/vomiting, pain, insomnia, appetite loss, constipation, diarrhea, systemic therapy side effects, breast symptoms, arm symptoms, upset by hair loss)

Comparison between patients across different stages of breast cancer showed significant difference in the functioning scales (role functioning, social functioning, body image, future perspective), and symptom scales (fatigue, nausea/vomiting, pain, constipation, systemic therapy side effects).

Among the types of treatment by patients with regards to surgical intervention, patients who had a breast conserving surgery projected better QOL. Significant results were found in the symptom scale (nausea/vomiting, systemic therapy side effects, and breast symptoms).

The results of the linear regression analyses showed that only age and employment status were statistically significant for predicting patients' Global Health Status (GHS) as shown in the regression table (Table 4). The predictors explained 10.6% of the variation in global health (R-squared=0.106) as shown in Table 5. The final equation for the multiple linear regression was:

$$GHS = 40.75 + 0.445(Age) + 11.07(Employment)$$

## Discussion

At this study identified some of the important factors that contribute to good quality of life, among adult female breast cancer patients as well as significant predictors for Global Health Status (GHS). Socio-demographic factors that significantly contributed to good quality of life are age older than 55 years, employment, and patients who are not in any marital relationship adjusted for age and ethnicity.

Clinical characteristics that contributed to good quality of life were early stage of disease, longer time period since diagnosis, patients who underwent breast conserving surgery, post-menopausal status and patients who were currently on the follow-up phase post chemotherapy and radiotherapy.

Patients above the age of 55 years showed better quality of life than patients who are 55 years old and younger. Significantly better scores were recorded among older respondents compared to younger women in the items from the symptom scales. Distress among younger patients are about their career prospects and earning capacity. Older patients on the other hand, may have children who are already financially independent. Greater anxiety and fear of tumour recurrence may contribute to poorer quality of life among younger women (Jessica et al., 2012).

In this study, it was found that pre-menopausal patients had significantly poorer quality of life compared to the post-menopausal patients. Significant differences were found in both in the functional and symptom scales. Pre-menopausal women who were put on adjuvant chemotherapy will develop estrogen imbalances which can ultimately lead to early onset of amenorrhea and infertility (Goodwin et al., 1999; Dennerstein et al., 2006; O Zainal et al., 2007; Sukumvanich et al., 2010; Shoshana et al., 2013). In this study, pre-menopausal women who are in the reproductive age group exhibited poorer QOL due to the distress of being infertile.

Majority of the respondents were Malays, followed by Chinese, Indians, and others. Chinese women in this study have the best QOL. According to Wong-Kim et al. (2005), Chinese women were more concerned about survival and less concerned about body image.

In this study, employed patients scored better quality of life in all items compared to patients who were unemployed. It was also revealed that only 9.4% of the total respondents are recipients of financial aid. Earning capacity is indeed very important to ensure good quality of life among these patients (Saleha et al., 2010). A working mother may have to stop employment due to the disease and the burden is heavier if she is the sole breadwinner. Defaulting treatment to continue work on the other hand leads to complications and disease progression.

In Malaysia, Government employees are entitled for unpaid leave up to 2 years duration. This benefit provides some form of security as far as employment is concerned. However, this is not the scenario for patients who are working in the private sector. A more comprehensive plan is needed to provide financial aid to cancer patients in Malaysia as majority of them come from lower income groups (Hwa et al., 2011). A structured return to work program for cancer patients in general should also be implemented.

Married women in this study have reported poorer quality of life compared to single, divorced, or widowed women. This may be a reflection of how the patients place importance on their relationship with their spouse (Yusoff N et al., 2012). Married women who have been diagnosed with breast cancer may feel insecure about their partner's acceptance with added fear that their spouses

might leave them for other women (Ghufran Ahmed Jassim et al., 2013).

This study also compared quality of life scores between respondents from different stages of cancer. Quite understandably, the best quality of life was reported among respondents from stage I cancer, while the worst quality of life was reported among respondents from stage IV cancer, in the functional and symptom scales. As the nutritional status of patients in advanced disease is invariably compromised, these patients are usually unfit to receive the usual dose of chemotherapy or radiotherapy contributing to poorer treatment response and hence poor quality of life.

More than 50% of the patients in this study were comprised of stage III and stage IV cancer. Malay respondents form the highest proportion at stage III and stage IV disease (64.6%). A study by CH Yip et al (2006) concluded that there are more patients who present with early stage of tumour in the West compared to Malaysian women, which is consistent to findings in this study. This may be due to the fact that more Malay breast cancer patients would seek traditional treatment before commencing hospital treatment, due to the negative perception of the disease, poverty and poor understanding of disease (Hisham et al., 2004).

Another specific objective of this study is to ascertain if there are any differences in the quality of life among patients who are in the treatment phase, with those who are in the follow-up phase. Patients in the follow up phase in this study had significantly higher scores of quality of life in functional and symptom scales compared to patients in the treatment phase. This is consistent with other studies which reported long term, disease free breast cancer survivors showed high levels of functioning and quality of life many years after primary treatment (Ganz et al., 2002). Patients on the treatment phase with chemotherapy may experience side effects of the drugs, and chemotherapy toxicities (Mor et al., 1994). The impairment of quality of life during the phase of treatment is however limited to the short term rather than long term (Aaronson et al., 1993; Fayers et al., 2001).

This study also compared the mean quality of life scores between patients who underwent mastectomy, with patients who did not have any surgical intervention, and patients who underwent breast conserving surgery. There were also respondents who were not subjected to any surgical intervention due to either palliative reasons, or because they have been planned for neo-adjuvant chemotherapy. Breast conserving surgical options are performed on patients in early stage of cancer which involves lumpectomy or a wide local excision of tumour with or without axillary clearance.

Patients who underwent breast conserving surgery scored better quality of life scores compared to patients who underwent mastectomy or patients with inoperable tumours in the functional and symptom scales. This is due to the fact that only early stage cancers could be managed via breast conserving surgery. Consequently, breast conserving surgery also contributes to better body image which leads to better quality of life.

In conclusion, in this study, age and employment were

found to be significant predictors for Global Health Status (GHS). The Quality of Life among breast cancer patients reflected by the GHS improves as age and employment increases. Patients who are older than 55 years of age, post-menopausal, Chinese ethnicity, Stage I malignancy, patients who have completed treatment, and patients who underwent breast conserving surgery were more likely to have a better QOL. The results obtained are comparable with other breast cancer QOL studies that have been done using the EORTC Questionnaire.

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