



# Assessment of Health Related Quality of Life Using EORTC QLQ BR-23 among Breast Cancer Patients in Pakistan

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## Authors' contributions

This work was carried out in collaboration among all authors. Author MM designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author AH managed the analyses of the study. Author NI managed the literature searches. All authors read and approved the final manuscript.

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## ABSTRACT

**Introduction:** Pakistan has the highest rate of breast cancer among all other Asian countries. Late presentation of breast cancer negatively impact health related quality of life among patients.

**Objective:** The present study was designed to assess health related quality of life using EORTC QLQ-BR23 among patients of breast cancer in Pakistan.

**Methodology:** A descriptive cross sectional study design was used to assess health related quality of life among 382 breast cancer patients using EORTC QLQ-BR23. Data was collected and statistically analysed using SPSS version 21.

**Results:** The results highlighted that the lowest scores for HRQoL were observed in the domain of functional scale i.e. sexual enjoyment (7.18,  $\pm$ 16.84) while highest scores were observed in the domains of body image (55.82,  $\pm$ 29.07) followed by systemic therapy side effects (50.88,  $\pm$ 18.47).

**Conclusion:** The current study concluded poor HRQoL with a negative impact on its all domains

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among breast cancer patients in Pakistan. Lowest scores for HRQoL were observed in the domain of functional scale i.e. sexual enjoyment and sexual functioning while, highest scores were observed in the domains of body image followed by systemic therapy side effects.

*Keywords: Breast cancer; health related quality of life; EORTC QLQ-BR23; patients; Pakistan.*

## 1. INTRODUCTION

Breast cancer has long been recognized as a non-communicable emerging threat. Every three minutes a woman is diagnosed globally with breast cancer constituting to 1 million annual cases. The prevalence of breast cancer has been rising at an alarming rate. More than two million women per year are being affected by breast cancer burdening health system and economy as well as families both financially and emotionally [1]. Health related quality of life (HRQoL) is a multidimensional concept in order to measure the impact of health status on quality of life. It measures how health has been affected physically, mentally and emotionally, this in return can be used to assess that new treatments are effective to improve patient's life [2]. Measuring HRQoL is an important endpoint as it provide directions for more efficient treatment in breast cancer patients [3, 4]. Breast cancer specific questionnaire is important in early identification of the patient with low functional and symptom scores with earlier interventions for improvement [5]. European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC-QLQ C30) questionnaire is accompanied with European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-BR23) questionnaire for quality of life assessment particularly in breast cancer and both of these questionnaires produce reproducible and valid results and are easily understandable [6].

Pakistan has the highest rate of breast cancer among all other Asian countries. It has been reported that one in nine Pakistani women has likely to experience this disease at some stage of their lives and about 77% of invasive breast cancer occurred in women above 50 years of age, but if diagnosed early, then 90% survival rates could be achieved [7]. Burden of breast cancer has increased in Pakistan drastically in recent years; accounting for approximately 16,000 deaths per year. The mortality rate reported was 25.2 per 100,000 population, which is highest among South Asian countries [8]. While according to population based Punjab

cancer registry (PCR), of Lahore district with a population of 15 million for 2010-2012 reported age standardized incidence rate as 47.6 per 100,000 population. Furthermore, among all of the cancers diagnosed in females; almost half of them had breast cancer, thus highlighting high incidence of breast cancer in Pakistan [9]. Breast cancer remains a major public health challenge in developed world despite of advancement in early diagnosis, better treatment strategies and awareness of established risk factors. Moreover, in developing countries, including Pakistan, with limited resources, the situation is much worse as women fear to mention it to their family and relatives and late presentation of disease result in increased mortality rate [4,10]. Late presentation of breast cancer negatively impact health related quality of life among patients [11]. There is need of extensive research to identify factors associated with health related quality of life that can assist clinicians in revamping treatment for breast cancer patients. Thus, the present study was designed to assess health related quality of life using EORTC QLQ BR-23 among breast cancer patients in Pakistan.

## 2. METHODOLOGY

A descriptive cross-sectional study design was used to assess health related quality of life among breast cancer patients attending healthcare facilities treating breast cancer in twin cities (Islamabad and Rawalpindi) of Pakistan. All public and private health care facilities treating breast cancer located in twin cities were included in study. Study respondents included patients diagnosed with breast cancer and their caregivers. Patients having age 20 years and older, diagnosed with breast cancer and who could speak & understand Urdu or English were included, while all other cancer patients other than breast cancer and patients who were not willing to participate were excluded. Approval was also taken from Medical superintendents of different healthcare facilities of Rawalpindi and Islamabad. Patients were briefed regarding nature and objectives of the study. The sample size was calculated by using Rao soft at 95% confidence interval and 5% margin of error which came to be 382 breast cancer patients.

Convenience sampling technique was used for selection of respondents available and willing to participate at the time of data collection. A pre validated questionnaire EORTC QLQ BR-23 was self-administered to patients and collected back on the same day to avoid biasness. It is a breast cancer specific questionnaire used among patients of breast cancer varying in disease stage and treatment modality (i.e. surgery, chemotherapy, radiotherapy and hormonal treatment). It consist of functional scales including body imaging, sexual functioning, sexual enjoyment and future perspective and symptoms scale consisting of systemic therapy side effects, breast symptoms, arm symptoms, and upset by hair loss.

Pilot testing was performed on 10% of the sample size for assessing reliability of the tool.

The value of Cronbach's alpha for EORTC QLQ BR-23 was 0.71. After data collection, data was cleaned, coded and entered in SPSS version 21. Descriptive statistics comprising of frequency and percentages were calculated. Non-parametric tests Kruskal Wallis and Mann Whitney tests ( $p \geq 0.05$ ) were applied to find out the differences among different variables.

### 3. RESULTS

#### 3.1 Demographic Characteristics of Respondents

Out of 382 respondents 11.5% (n=44) were in age range 20 -29 while 14.1%, (n=54) were more than sixty years old. Of the total patients, 87.7% (n =335) received treatment from public sector

**Table 1. Demographic characteristics of respondents**

<b>Indicator</b>		<b>Patient n (%)</b>
<b>Age</b>	20-29Y	44 (11.5)
	30-39Y	117 (30.6)
	40-49Y	109 (28.5)
	50-59Y	58 (15.2)
	>60Y	54 (14.1)
<b>Hospital Sector</b>	Public	335 (87.7)
	Private	46 (12)
<b>Province of Residence</b>	Punjab	285 (74.6)
	Sindh	2 (0.5)
	Gilgit Baltistan	7 (1.8)
	Azad Jammu and Kashmir	14 (3.7)
	KPK	35 (9.2)
	Baluchistan	1 (0.3)
	Islamabad	38 (9.9)
<b>Marital Status</b>	Single	42 (11)
	Married	267 (69.9)
	Widow	23 (6)
	Separate	39 (10.2)
	Divorce	11 (2.9)
<b>Level of Education</b>	Illiterate	77 (20.2)
	Primary	171 (44.8)
	Secondary	89 (23.3)
	Bachelors	34(8.9)
	Masters	9(2.4)
	Post Graduate	2(0.5)
<b>No of Children</b>	None	132 (34.6)
	1	23 (6)
	2	46 (12)

Indicator		Patient n (%)
	3	73(19.1)
	4	50(13.1)
	>4	58(15.2)
<b>Monthly Income</b>	<20,000PKR	136 (35.6)
	21,000-40,000PKR	164 (42.9)
	41,000-60,000PKR	58 (15.2)
	61,000-80,000PKR	17 (4.5)
	81,000-100,000PKR	6 (1.6)
	>100,000PKR	1 (0.3)
<b>Settings</b>	Urban	177 (46.3)
	Rural	205 (53.7)
<b>Stages of Breast Cancer</b>	Stage 1	43 (11.3)
	Stage 2	264 (69.1)
	Stage 3	68 (17.8)
	Stage 4	1(3)
	Not Known	6 (1.6)
<b>Type of Comorbidities</b>	None	271 (70.9)
	Hypertension	81 (21.2)
	Diabetes mellitus	10 (2.6)
	Others	1 (0.3)
	Hypertension & Diabetes	19 (5)
<b>Type of Therapy</b>	Chemotherapy	181 (47.4)
	Radiotherapy	21 (5.5)
	None	112 (29.3)
	Both	68(17.8)
<b>Type of Surgery</b>	Mastectomy	259 (67.8)
	Lumpectomy	17 (4.5)
	None	99 (25.9)
	Both	7(1.8)
<b>Mode of Payment</b>	Self-Finance	161 (42.1)
	Bait ul mal	186 (48.7)
	Entitled	34 (8.9)
<b>Family History</b>	Known	83 (21.7)
	Not known	299 (78.3)

**Table 2. Domains of HRQoL using EORTC QLQ-BR23**

Indicator	Mean	Standard deviation
<b>Functional Scale</b>		
Body Image (BRBI)	55.82	± 29.07
Sexual Functioning (BRSF)	8.66	± 16.08
Sexual Enjoyment (BRSE)	7.18	± 16.84
Future Perspective (BRFP)	17.53	± 28.94
<b>Symptom Scale</b>		
Systemic Therapy Side Effects (BRST)	50.88	± 18.47
Breast Symptoms (BRBS)	30.90	± 21.72
Arm Symptoms (BRAS)	54.71	± 32.74
Upset by Hair Loss (BRHL)	45.17	± 30.23

**Table 3. Impact of demographic characteristics on EORTC QLQ-BR23 domains of HRQoL**

Indicator		Functional Scale					Symptoms Scale			
		BRBI Mean (±S.D)	BRSEF Mean (±S.D)	BRSEE Mean (±S.D)	BRFU Mean (±S.D)	BRST Mean (±S.D)	BRBS Mean (±S.D)	BRAS Mean (±S.D)	BRHL Mean (±S.D)	
<b>Age</b>	20-29Y	41.85 (33.3)	16.77(18.57)	16.02(20.85)	16.66(26.4)	40.9(15.68)	26.51(21.99)	36.11(34.9)	42.52(34.62)	
	30-39Y	47.79(28.8)	13.18(17.28)	10.33(19.26)	16.23(24.21)	50.34(19.59)	32.66(23.17)	52.13(31.17)	51.61(31.94)	
	40-49Y	54.12(28.54)	7.44(14.72)	6.52(17.22)	16.2(28.51)	51.55(18.36)	28.28(18.63)	53.92(32.52)	42.58(30.28)	
	50-59Y	68.53(25.41)	0.7(3.04)	1.28(8.73)	18.39(31.94)	55.66(16.64)	32.95(25.14)	65.51(30.56)	43.71(26.57)	
	>60Y	74.38(20.01)	3.2(16.4)	0.83(4.5)	22.84(37.09)	53.7(73.6)	33.74(19.66)	65.43(29.72)	40.18(24.45)	
<b>Marital Status</b>	Single	47.61(33.31)	2.27(7.46)	1.8(7.11)	15.07(24.6)	53.4(20.7)	30.68(23.64)	44.97(38.25)	48.46(31.3)	
	Married	56.24(28.05)	11.95(18.03)	9.9(19.32)	18.97(29.72)	49.18(17.8)	30.44(20.97)	54.76(31.4)	45.13(31.09)	
	Widow	77.5(26.4)	0.30(0.09)	0.30(0.09)	28.98(40.58)	57.34(14.95)	37.69(14.09)	67.63(27.1)	40.6(24.45)	
	Separate	51.7(25.8)	0.32(0.05)	0.32(0.05)	5.98(15.04)	53.35(20.47)	37.39(12.39)	56.1(35.95)	44.5(26.75)	
	Divorce	46.2(33.2)	0	0	9.09(21.55)	60.37(20.12)	44.69(7.7)	58.58(35.51)	45.48(30.76)	
<b>Level of Education</b>	Illiterate	66.12(27.5)	6.00(19.2)	4.05(15.22)	18.18(33.3)	52.56(20.26)	31.45(22.75)	57.57(34.61)	38.18(28.86)	
	Primary	56.6(28.1)	21.27(41.5)	7.12(16.9)	16.6(27.6)	52.1(72.4)	32.42(21.7)	57.56(33.04)	47.03(30.52)	
	Secondary	51.87(27.9)	9.85(15.7)	7.6(15.6)	18.35(27.36)	47.3(18.36)	26.59(18.9)	49.68(30.98)	43.87(30.7)	
	Bachelors	43.8(32.5)	15.27(16)	11.25(23.4)	15.68(30.96)	45.93(18.49)	32.18(26.79)	42.81(29.6)	50.05(28.61)	
	Masters	40.7(28.7)	13.1(13.7)	11.25(23.4)	25.92(32.39)	60.8(14.43)	4.56(15.15)	61.7(26.7)	59.25(27.77)	
	Post Graduate	33.33(47.1)	0	0	0	76.19(6.7)	3.33(15.71)	94.4(7.8)	66.66(47.14)	
<b>Monthly Income</b>	<20,000PKR	56.61(28.85)	8.21(16.91)	7.47(17.01)	14.7(27.14)	50.8(20.05)	32.18(19.04)	52.53(33.02)	42.72(32.52)	
	21,000-40,000PKR	54.97(29.9)	9.66(16.86)	7.63(17.78)	18.08(28.68)	49.53(17.37)	28.99(23)	53.25(33.10)	43.35(30.61)	
	41,000-60,000PKR	54.31(28.23)	5.86(10.99)	4.71(14.53)	21.26(30.39)	52.87(18.61)	34.48(24.68)	59.38(28.65)	52.32(25.01)	
	61,000-80,000PKR	58.33(27.63)	10.9(16.52)	7.95(14.5)	11.76(28.72)	54.34(17.5)	28.43(20.58)	64.7(37.93)	56.86(19.59)	
	81,000-100,000PKR	61.11(26.7)	14.05(16.21)	11.27(17.08)	33.33(42.16)	58.73(11.13)	29.63(13.45)	68.51(38.75)	50(27.88)	
	<b>Settings</b>	Urban	55.97(27.79)	10(15.4)	8.02(16.6)	21.28(32.26)	51.97(17.48)	30.53(23.33)	56.62(32.96)	44.12(29.5)
	Rural	55.69(30.19)	7.5(16.5)	6.46(17.03)	14.3(25.37)	49.94(19.27)	31.21(20.27)	53.06(32.94)	46.08(30.89)	
<b>Stages of Breast</b>	Stage 1	57.94(29.03)	14.82(18.5)	13.27(21.9)	19.37(31.9)	38.09(12.85)	21.18(17.45)	47.8(32.6)	35.76(32.7)	
	Stage 2	55.24(28.5)	18.75(16.6)	6.9(16.77)	17.8(28.15)	50.84(17.85)	31.2(20.34)	55.6(31.7)	45.13(29.9)	

Indicator		Functional Scale					Symptoms Scale			
		BRBI Mean (±S.D)	BRSEF Mean (±S.D)	BRSEE Mean (±S.D)	BRFU Mean (±S.D)	BRST Mean (±S.D)	BRBS Mean (±S.D)	BRAS Mean (±S.D)	BRHL Mean (±S.D)	
<b>Cancer</b>	Stage 3	56.24(30.8)	4.10(9.95)	4.1(12.19)	15.19(30.7)	59.59(18.77)	35.45(26.68)	57.18(36.6)	50(26.6)	
	Not known	65.28(38.5)	13.94(16.33)	11.16(17.17)	22.22(27.21)	42.85(23.52)	35.18(30.9)	38.8(25.09)	55.6(50.03)	
<b>Type of Comorbidities</b>	None	51.9(28)	10.38(16.6)	8.95(18.6)	15.8(26.5)	49(18.5)	30.8(21.6)	51(32.7)	45.5(30)	
	Hypertension	63.9(29.5)	5.8(16)	3.8(11.7)	21.8(34.2)	54.8(17.5)	31.4(21.9)	63.9(31.6)	42.02(29.6)	
	Diabetes mellitus	65(30.1)	0.13(0.17)	0.13(0.17)	26.6(40.9)	49.5(22.8)	20(12.6)	48.8(27.3)	50.1(44.9)	
	Both	73.6(26.8)	1(3.7)	0.15(0.16)	19.3(30)	60.9(14.2)	33.33(24.5)	74.2(24.3)	52.6(25.5)	
<b>Type of Therapy</b>	Chemotherapy	53.8(27.9)	8.85(16.9)	6.18(15.8)	19.7(29.3)	52.8(16.1)	30.7(20.9)	57.4(30.7)	50.4(27.07)	
	Radiotherapy	53.5(25.6)	5.6(13.2)	4.85(11.91)	17.46(29.09)	53.5(16.35)	32.2(25.5)	60.3(30.5)	42.8(26.07)	
	None	61.6(31.19)	10.5(17.27)	11.13(20.6)	17.8(29.9)	41.4(19.5)	32.6(21.3)	47.2(33.63)	28.4(34.3)	
	Both	52.08(28.5)	6.02(11.71)	4.06(12.2)	11.27(25.5)	60.5(16.6)	28.02(23.18)	58(35.7)	59.3(18.07)	
<b>Type of Surgery</b>	Mastectomy	50.8(28.4)	5.7(12.9)	4.5(13.9)	13.2(24.7)	53.7(17.07)	31.08(22.3)	55.38(32.7)	47.4(28)	
	Lumpectomy	53.4(31.6)	12.8(14.9)	7.9(14.5)	7.8(18.7)	50.7(15.7)	25.4(18.3)	60.7(37.7)	47.07(26.47)	
	None	71.1(24.7)	15.4(20.9)	13.9(21.7)	30.3(36.2)	42.6(20.2)	30.6(20.7)	50.6(32.2)	37.82(35.4)	
	Both	30.9(23.9)	11.9(15.7)	9.6(16.2)	19.04(26.2)	60.5(12.8)	41.2(18.9)	73.01(20.1)	61.9(23)	
<b>Mode of Payment</b>	Self-Finance	54.8(29.9)	9.11(15.07)	7.35(16.9)	16.7(28.16)	49.6(19.1)	30.08(22.8)	56.5(33.4)	43.5(30.4)	
	Bait ul mal	57.9(28.6)	7.74(16.5)	5.86(15.15)	16.12(28.16)	50.8(17.9)	31.7(19.6)	51.31(32.44)	46.8(30)	
	Entitled	48.03(26.1)	11.9(18.06)	13.8(23.3)	28.4(32.9)	56.1(18.03)	29.5(27.2)	63.07(28.6)	44.1(31.3)	
<b>Family History</b>	Known	50.3(29.5)	14.5(17.9)	12.53(20.6)	17.2(30.9)	54.15(18.5)	31.6(23)	56.2(33.12)	48.6(31.71)	
	Not Known	57.3(28.7)	7.03(15.16)	5.7(15.3)	17.6(28.4)	49.9(18.3)	30.6(21.3)	54.2(32.6)	44.2(29.8)	
<b>No of Children</b>	None	55.05(30.3)	7.8(14.7)	6.7(16.12)	13.6(24.7)	49.8(19.9)	31.6(22.99)	47.8(33.12)	44.7(32.02)	
	1	39.5(24.7)	14.6(16.8)	14.6(22)	23.2(29.2)	45.3(13.9)	27.5(23.4)	53.14(35.2)	39.2(29.4)	
	2	50.7(27.7)	12.4(16.2)	9.5(16.6)	21(28.4)	56.5(16.7)	35.2(24.9)	55(31.6)	51.4(32.6)	
	3	53.5(27.5)	6.9(11.3)	3.2(9.6)	17.8(28.9)	48.7(18.1)	28(19.5)	55.9(31.6)	47(27.05)	
	4	56(31.81)	10.7(24.9)	8.1(19.7)	16(28.7)	54(16.3)	30.6(20.6)	62.6(29.4)	44.7(22.9)	
	>4	70.8(22.4)	5.6(13.3)	7.6(19.7)	22.4(37.14)	51.14(19.1)	30.9(18.9)	62.2(33.8)	41.4(29.3)	

while 12% (n=46) from treated in private sector. Out of all the patients, 20.2% (n=77) were illiterate, while 44.8% (n=171) were matric. Moreover, 11.3% (n=43) of the patients had stage I of breast cancer and 70.9% (n=271) had no comorbidity. Furthermore, 47.4% (n=181) were treated through chemotherapy while 5.5% (n=21) through radiotherapy and 67.8% (n=259) underwent mastectomy (Table 1).

### **3.2 Domains of Health Related Quality of Life (HRQoL) Using EORTC QLQ-BR-23**

The results highlighted that the lowest scores for HRQoL were observed in the domain of functional scale i.e. sexual enjoyment (7.18,  $\pm 16.84$ ) while highest scores were observed in the domains of body image (55.82,  $\pm 29.07$ ) followed by systemic therapy side effects (50.88,  $\pm 18.47$ ). A detailed description is given (Table 2).

### **3.3 Impact of Demographic Characteristics on Domains of HRQoL by EORTC QLQ-BR23**

The results of the current study reported that age group 20 -29 years had better HRQoL in all domains except body Image (BRBI) (41.85,  $\pm 33.3$ ) and upset by hair loss (BRHL) (42.5,  $2\pm 34.62$ ) respectively. Furthermore, breast cancer patients having more qualification reported worse on symptoms scale as compared to illiterate patients. Additionally, those patients which had average monthly income 81,000-100,000 PKR reported better on breast cancer specific questionnaire. Moreover, those respondents which were not diagnosed yet reported better scores on all domains of functional scale. The results highlighted that respondents having no existing disease had better functioning except in domain of body image BRBI (51.9,  $\pm 28$ ). A detailed description is given (Table 3).

## **4. DISCUSSION**

On the EORTC QLQ BR 23, the results of the present study showed that highest mean scores were observed in body image and lowest scores among sexual functioning and sexual enjoyment which was severely affected among breast cancer patients. This might be due to the fact that breast cancer is considered as social taboo itself in Pakistan and due to cultural barrier

sexual functioning could not be discussed openly by the women in Pakistan which could be one of the reason for lowest score in this domain. These results are supported by findings from a study conducted in Saudi Arabia in which mean score was lowest among sexual enjoyment [12]. Furthermore, the results of the present study showed that over a quarter of breast cancer patients felt physically less attractive, less feminine, less interested in sex as a result of disease or treatment and dissatisfied with their body. Majority of them were very much worried about their health in future. This might be due to lack of disease acceptance by the women as well as the society along with limited sociosocietal which results in low score in body image among women as they feel insecure about their future. These results are in concordance with findings of a study conducted in China where sever impairments were observed in domains of body image, sexual functioning and future perspective [13]. On the symptoms scale, the results of the current study showed that very few of the breast cancer patients reported headaches, painful eyes and skin problems but most of them experienced quite a bit symptoms including dry mouth, different than usual taste of food and drink, felt ill, lost their hair, pain, over sensitive, swelling in their affected breast and pain in their arm or shoulder. The findings are in accordance with a study from Morocco in which majority of patients' experienced worst symptoms after breast cancer [14].

## **5. LIMITATIONS OF THE STUDY**

The main issues faced during the study were time and financial constraints and cross sectional study design which doesn't show cause and effect relationships. Furthermore, the results of this study are limited to two cities of Pakistan and should not be generalized to other parts of country. Moreover, many of the respondents were hesitant to share their views against some culturally sensitive questions i.e. sexual functioning and sexual enjoyment questions.

## **6. CONCLUSION**

The current study concluded poor HRQoL with a negative impact on its all domains among breast cancer patients in Pakistan. Lowest scores for HRQoL were observed in the domain of functional scale i.e. sexual enjoyment and sexual functioning while, highest scores were observed in the domains of body image followed by systemic therapy side effects. Breast cancer is

considered as one of the social taboo in Pakistan. Women feel shy to share and seek assistance for evaluation of breast cancer. Massive public health awareness campaign focusing on women as well as their partners and families must be initiated at large scale in Pakistan with a special focus on tribal and rural settings. HRQoL studies must also be conducted in relation to breastfeeding, duration of disease, size of tumor and post-menopausal symptoms among breast cancer patients for designing effective interventions for improving overall wellbeing of women in Pakistan.

### CONSENT

Verbal and written consent were obtained prior to data collection. Respondents were ensured of the confidentiality of their responses along with full right to withdraw from the study at any time.

### ETHICAL APPROVAL

Study approval was taken from the Ethical Committee of Hamdard University (BASR-82-5.6).

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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