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RESEARCH ARTICLE OPEN ACCESS

Sociodemographic and clinical predictors of quality of life in women with breast cancer: Evidence from an oncology centre in Kirkuk, Iraq

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Abstract
Objective: This study aimed to explore the sociodemographic and clinical predictors of health-related quality of life (HRQOL) among women who have breast cancer attending the Oncology and Haematology Centre in Kirkuk, Iraq.
Methods: A cross-sectional study was conducted among 340 women diagnosed with breast cancer and attending the oncology and haematology Centre in Kirkuk city. Data were collected using the Functional Assessment of Cancer Therapy-Breast (FACT-B) along with a structured questionnaire. Data were analysed using SPSS version 26. A simple descriptive analysis approach and an inferential analysis approach were utilised to assess the significant disparities in women's HRQoL and their characteristics.
Results: The mean HRQOL score was 75.4 ± 20.45, with 78.8% of participants reporting a moderate quality of life. Married women had significantly higher HRQOL scores (78.45, P = 0.001), while those with low socioeconomic status had significantly lower scores (67.74, P = 0.002). Participants in stages III and IV of cancer, and those undergoing treatment for less than a year, reported the lowest mean scores (65.69 ± 13.75). Among treatment modalities, hormonal therapy was associated with the highest HRQOL score (100.36 ± 23.75), whereas chemotherapy was linked to the lowest (66.72 ± 13.55; P = 0.001).
Conclusion: Women diagnosed with breast cancer in Kirkuk indicated a moderate level of health-related quality of life, which was significantly influenced by both sociodemographic and clinical factors. Regular HRQOL assessments are recommended, particularly for women from lower socioeconomic backgrounds, to enhance supportive care and improve outcomes throughout the cancer care continuum.

Keywords: Breast cancer, Quality of life, Iraqi women, Predictors

Plain English Summary

Breast cancer is the most common type of cancer in women in Iraq, raising concerns about their quality of life (QOL). This study aims to explore the sociodemographic and clinical predictors of health-related quality of life (HRQOL) among women who have breast cancer attending the Oncology and Haematology Centre in Kirkuk, Iraq. A cross-sectional study was conducted from November 2024 to May 2025. Samples of 340 women diagnosed with breast cancer and attending the oncology and haematology centre in Kirkuk city were included. More than three-quarters of the participants reported a moderate quality of life. Married women had significantly higher HRQOL scores, while those with low socioeconomic status had significantly

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lower scores. Participants in stages III and IV of cancer, and those undergoing treatment for less than a year, reported the lowest mean scores. Women diagnosed with breast cancer in Kirkuk indicated a moderate level of health-related quality of life, which was significantly influenced by both sociodemographic and clinical factors.

Introduction

Breast cancer is among the most prevalent malignancies in women globally and constitutes a primary cause of mortality in more than 140 nations (1). Breast cancer, according to the International Agency for Research on Cancer (IARC), was the predominant malignancy among women in Iraq, with 8,626 new cases and a mortality rate of 3,372 (2). Over four years, the most common cancer diagnosed in Kirkuk City was breast cancer, with a prevalence of 45.67% (3).

In the recent past, cancer was considered a "death sentence, but the prognosis has improved these days. Cancer has evolved into a chronic condition with an elevated survival rate because of advances in new medications and treatments (4). Given the prevalence of the disease and high survival rates, it is becoming more and more crucial to find out the quality of life of these women, because it shows how the disease affects them and how well the treatment works in many areas of their lives, including the physical, psychological, and social health of women (5, 6). Despite these initiatives, managing this chronic disease remains challenging even after treatment; still, early discovery is the greatest tool for managing it (7). Factors like age and marital status substantially affect the quality of life for people diagnosed with breast cancer; older women tend to experience greater physical symptoms, while younger women often require more support in areas like body image and social functioning due to the changes they undergo during treatment (8). Following surgical intervention resulting from significant trauma and psychological distress due to a complete or partial mastectomy, individuals may experience diminished self-esteem and a compromised body image, particularly in social contexts (9).

Additionally, the health outcomes of those with breast cancer are greatly influenced by their socioeconomic status, the stage of the disease, and the likelihood of relapse, as these factors worsen their quality of life (10). It is also influenced by the limited availability of cancer healthcare services, especially given the lack of treatment facilities and limited therapeutic options in the nation (11). The adverse effects and repercussions of breast cancer treatments, including surgery and chemotherapy, not only affect the patient psychologically but also harm their ability to tolerate therapy as well as their social and emotional relationships, which significantly impact the quality of life (12, 13). Therefore, it's essential to acknowledge the distinct needs and challenges individuals face at various stages of their illness and treatment, as quality of life enables us to assess the disease's impact on them during their recovery (14). This comprehension facilitates the development of personalised treatment plans, prioritising preserving a high quality of life while ensuring clinical efficacy (15). Kirkuk is one of the governorates with a centre for breast cancer treatment, but understanding how sociodemographic and clinical factors influence the quality of life of women with this disease is limited. This lack of data poses a challenge for clinicians seeking new interventions that are constantly emerging in the healthcare sector. Therefore, this study aims to assess the socio-demographic and clinical determinants influencing the health-related quality of life in women with breast cancer receiving care at the oncology and haematology centre in Kirkuk, Iraq.

Methodology

Study Design and Setting

This study employed a cross-sectional descriptive design at the Oncology and Haematology Centre from November 2024 to May 2025 in Kirkuk. Kirkuk is a governorate located in northern Iraq, approximately 148 miles (238 km) north of Baghdad (16).

Participants and Sampling

A non-probability (purposive) sample included 340 women with breast cancer who were undergoing treatment at the oncology centre. The sample size was determined using Slovin's formula, with an acceptable margin of error of 0.05; it was estimated that the minimal sample size required was 303 respondents. The sample size was expanded, considering a 10% non-response rate. The resulting ultimate sample size was 340 participants. Participants met the following inclusion criteria: women aged 20 and older; have been diagnosed with breast cancer and informed of their condition; underwent breast tumour removal surgery; currently receiving multimodal therapy, chemotherapy (initiated at least two months prior), biological therapy, and /or hormonal therapy; and willing to participate in the study. Women who have not been formally informed of

their breast cancer diagnosis, do not know about their illness; have mental health disorders and communication difficulties; women undergoing treatment without prior tumour removal; and women who participated in the pilot study were eliminated from the present study.

Study instrument

The tool used to collect data included a structured questionnaire based on a review of literature, which consisted of two parts. The first part highlighted socio-demographic factors, including age, marital status, educational level, occupation, residence, and socioeconomic status. While the second part focused on, clinical characteristics and daily habits, which included details like, duration of the disease, current stage of cancer, affected breast, type of surgery performed, type of treatment being received, family history of breast cancer, presence of any other chronic diseases, smoking status and the primary source of daily nutrition. The third part included the Functional Assessment of Cancer Therapy—Breast (FACT-B), version 4, which has been used in many studies to evaluate HRQoL for those diagnosed with breast cancer (17). This tool has 37 questions and is designed to measure five areas of health-related quality of life, which include: physical well-being (PWB), social well-being (SWB), emotional well-being (EWB), functional well-being (FWB), and the breast cancer subscale (BCS).

Each domain evaluates different aspects of the patient's quality of life. Physical well-being (PWB), social well-being (SWB), and functional well-being (FWB) consist of 7 items; emotional well-being (EWB) consists of 6 items; and the breast cancer subscale (BCS) consists of 10 items. Among all subscales, FACT-B-Total's maximum score of 148 suggests an optimal quality of living. Each section contains five response options: not at all, a little bit, somewhat, quite a bit, and very much. The scoring system ranges from zero to four (18). Thirteen experts from different specialities validated the questionnaire. This group included representatives from the Community Nursing Department at the Universities of Kirkuk, Raparin, Baghdad, and Karbala, alongside professionals from the Department of Family and Community Medicine, University of Kirkuk, and the Departments of Gynaecology, the Department of Psychiatry, and the Department of Adult Nursing at the University of Kirkuk. The experts were chosen to guarantee the validity of the questionnaire's contents, depending on their academic and specialised knowledge.

The questionnaire was pilot-tested on 30 women who met the eligibility criteria but were excluded from the final sample. Reliability was measured using the Cronbach's alpha coefficient. This was employed to ascertain the internal consistency of the items with a value of 0.91. With a minor modification, this result showed that the questionnaire was reliable. Information was gathered via in-person interviews between the researcher and participants.

Statistical analysis

Data processing and statistical analysis were conducted using the Statistical Package for Social Sciences (SPSS, version 26) software. The statistical analyses were conducted utilising a basic descriptive analytic method (frequency, percentage, means, and standard deviations) and an inferential analysis approach (Spearman's rank correlation coefficient, the point serial correlation coefficient, the Mann-Whitney U test, and the Kruskal-Wallis U test) for the notable disparities between women's HRQoL and their characteristics. The level of significance was fixed at ($p \leq 0.05$).

Ethical consideration

The study received approval from the Scientific Committee (Research Ethics Committee) of the College of Nursing, University of Kirkuk (Issue No. 1, 2024). Official approval to perform the study was obtained from the Kirkuk Directorate of Health to access the Oncology and Haematology Centre (Issue No. 889, 2024). Participants provided verbal agreement following an explanation of the objective of the study, as well as the confidentiality of their identity.

Results

Of the 340 women, 69.2% were aged between 45-64 years, with a mean and standard deviation of (53.3±10). Around three-quarters (73.8%) were married, 36.5% illiterate, 72.9% were living in urban areas, and more than half of the sample (55.3%) were from low socio-economic status (Table 1).

Table 1. Distribution of the study participants according to their Socio-demographic Characteristics (N=340)

Variables	Classes	Frequency (f)	Percentage (%)
Age (Groups)	25 – 34	13	3.8

	35 – 44	44	12.9
	45 – 54	137	40.3
	55 – 64	98	28.9
	65 – 74	48	14.1
(M ± SD)	**53.3 ± 10**		
Marital status	Single	19	5.6
	Married	251	73.8
	Divorced	10	2.9
	Separated	4	1.2
	Widowed	56	16.5
Level of Education	Illiterate	124	36.5
	Able to read and write	59	17.4
	Primary school	62	18.2
	Intermediate school	27	7.9
	High/secondary school	6	1.8
	Diploma/College	62	18.2
Occupation	Housewife	287	84.4
	Governmental Employee	28	8.2
	Retired	11	3.2
	Freelancer	14	4.1
Residency	Urban	248	72.9
	Rural	92	27.1
Socioeconomic status	Low	188	55.3
	Moderate	132	38.8
	High	20	5.9

f: Frequency, %: Percentage, M: Mean, SD: Standard deviation

According to the duration of the disease, 69.1% of the women were newly diagnosed; 87.6% of them presented with advanced stage cancer, 47.9%, 39.7% stage II, and stage III, respectively. In terms of surgery type, 80.9% of the women predominantly had a modified radical/full mastectomy. At the same time, the treatment modalities indicated that chemotherapy was the primary treatment for 52.6% (Table 2).

Table 2. Distribution of the study sample according to their Clinical Characteristics (N=340)

Variables	Classes	Frequency (f)	Percentage (%)
Duration of disease (years)	< 1 year (New)	88	25.9
	1 – 2 (Recent)	147	43.2
	3 – 5 (Moderate)	59	17.4
	6 – 10 (Chronic)	39	11.5
	11 + (Long-term chronic)	7	2.1
(M±SD)	**2.5 ± 2.9**		
Current stage of cancer	Stage 0	0	0
	Stage I	19	5.6
	Stage II	163	47.9
	Stage III	135	39.7
	Stage IV	23	6.8
Affected Breast	Left	168	49.5
	Right	146	42.9
	Bilateral	26	7.6
Type of surgery	Lumpectomy	40	11.8
	Partial Mastectomy	25	7.3

	full Mastectomy	275	80.9
Type of treatment	Chemotherapy	179	52.6
	Biological	111	32.6
	Hormonal therapy	50	14.8
	Negative	218	64.1
Family history of cancer	First degree	34	10
	Second degree	41	12.1
	Third degree	47	13.8
Smoking status	Non-smoker	298	87.6
	Former smoker	40	11.8
	Current smoker	2	.6
Sources of daily food	Home-cooked	218	64.1
	Ready-made or canned	2	0.6
	Communication of both	120	35.3

f: Frequency, %: Percentage, M: Mean, SD: Standard deviation

Overall levels of Health-related Quality of Life revealed that 78.8% (n=268) of women had a moderate level of HRQoL and only 14.1% (n=48) showed good quality of life (Figure 1).

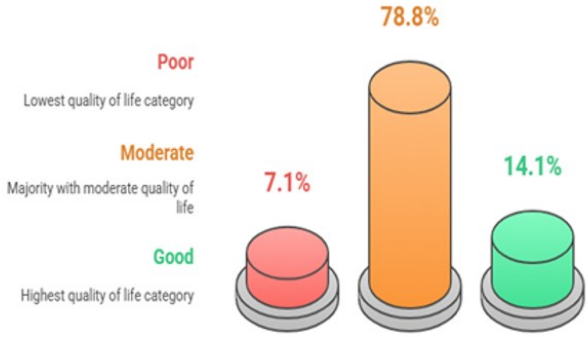

Figure 1: Health-Related Quality of Life Assessment
Poor= 0 – 49.33, Moderate= 49.34– 98.67, Good= 98.68 – 148

A highly significant inverse relationship between overall HRQoL among women and marital status (r=0.218, p<0.001) was recorded; specifically, married women reported the highest HRQoL mean score (78.45). In addition, socio-economic status revealed a highly significant relationship with the women's HRQOL (p<0.002). No significant relationship was found among women's HRQOL and age, educational level, and residence (Table 3).

Table 3. Relationship between levels of Health-Related Quality of Life among women and their Socio-demographic Variables (N=340)

Variables	Classes	Overall H-QoL		
		Mean	SD	Relationship
Age (year)	25 – 34	76.08	20.827	
	35 – 44	76.16	19.294	r^s = 0.028
	45 – 54	73.24	16.914	P= 0.605
	55 – 64	76.68	23.961	Sig= N.S
	65 – 74	78.04	22.975	
Marital status	Single	72.58	10.627	
	Married	78.45	20.583	r^s = -0.218
	Divorced	60.50	14.261	P= 0.001
	Separated	61.00	11.633	Sig= H.S
	Widowed	66.38	19.776	
Level of education	Illiterate	75.85	21.715	r^s = 0.027
	Read and write	72.47	21.852	p= 0.616

	Primary school	78.08	18.730	Sig= N.S
	Intermediate school	73.41	17.596	
	Secondary school	65.00	18.655	
	Diploma/College	76.47	19.462	
Occupation	Housewife	74.97	21.007	r^s = 0.091
	Employee	78.04	18.191	p= 0.093
	Retired	73.00	18.974	Sig= N.S
	Freelancer	80.86	13.347	
Residency	Urban	75.45	20.320	r^*= 0.015
	Rural	75.25	20.912	p= 0.781
				Sig= N.S
Socioeconomic status	Low	67.74	11.547	r^s = 0.150
	Moderate	77.30	16.086	p= 0.002
	High	93.80	23.872	Sig= H.S

M: Mean, SD: Standard deviation, r^s: Spearman Correlation coefficient, r^*: Biserial correlation coefficient, P: Probability, Sig: Significance, N.S: Not Significant, H.S: Highly Significant

Relationships between HRQOL among women and their clinical characteristics showed that the duration of disease (with p< 0.001) significantly affects HQoL, with women having less than one year of disease duration reporting the lowest mean HQoL score. Also, there was a significant correlation between the current stage of cancer and H-QoL (p< 0.003), indicating a decline in quality of life as the cancer stage advances. In addition, the type of treatment, specifically chemotherapy, exhibited a strong negative relationship with H-QoL (p<0.001), whereas hormonal therapy showed the highest mean HQoL score (Table 4).

Table 4. Distribution and Relationships between Levels of Health-Related Quality of Life among Women and their Clinical Variables (N=340)

Variables	Classes	Overall H-QoL		Relationship
		Mean	SD	
	< 1 year	65.69	13.753	
Duration of disease (years)	1 – 2	75.06	17.978	r^s = .278
	3 – 5	86.88	23.071	P= .001
	6 – 10	80.90	26.443	Sig= H.S
	11 +	77.00	23.868	
Current stage of cancer	Stage I	86.74	17.745	r^s = -.161
	Stage II	77.01	21.786	p= .003
	Stage III	72.98	19.042	Sig= H.S
	Stage IV	68.83	16.508	
	Left	74.58	19.178	r^s = .033
Affected Breas	Right	79.02	21.630	p= .546
	Bilateral	60.35	13.576	Sig= N.S
Type of surgery	Lumpectomy	73.45	19.389	r^s = .016
	partial Mastectomy	78.36	18.735	p= .771
	full Mastectomy	75.41	20.781	Sig= N.S
Type of treatment	Chemotherapy	66.72	13.547	r^s = .480
	Biological	78.15	18.086	p= .001
	Hormonal therapy	100.36	23.754	Sig= H.S
Family history of cancer	Negative	76.02	19.957	r^s = .026
	First degree	71.32	23.440	p= .637
	Second degree	75.56	19.172	Sig= N.S
	Third degree	75.30	21.810	
Smoking status	Non-smoker	75.40	20.127	r^s = .013
	Former smoker	76.00	22.906	p= .815
	Current smoker	51.00	0.000	Sig= N.S

Sources of daily food	Home-cooked	73.12	20.655	r^s = .160 p= .003 Sig= H.S
	Ready-made or canned	69.00	19.799	
	A combination of both	79.63	19.545	

M: Mean, SD: Standard deviation, r^s: Spearman Correlation coefficient, P: Probability, Sig: Significance, N.S: Not Significant, H.S: Highly Significant

Discussion

The study included 340 women diagnosed with breast cancer who were attending the oncology centre in Kirkuk City. The results revealed that two-fifths of the sample fell within the age group 45-54 years, and about one-third of them were between 55-64 years. The lowest percentage (3.8%) was among the age group of 25-34 years. The results showed that most patients were in their late middle age to early elderly years, a time linked to hormonal changes like menopause, which is a known risk factor for breast cancer (19). Age also affected overall quality of life, and the relationship between them is complex (20, 21).

Regarding marital status, the predominant portion of the study sample was classified as married. This result is congruent with the findings of the study conducted by Hashim & Mohammed, 2024 (22) in Hilla, Iraq. Regarding residency, about three-quarters of the participants were classified as urban residents.

More than half of the current study participants were classified as low socioeconomic status (SES), followed by around two-fifths with a moderate level, while only 5.9% of the sample were high level. This can be linked to the fact that over fifty per cent of the current study sample comprises individuals with no formal education and housewives; also, the services of this centre were free, making them more appealing to low-income individuals. This result aligns with a study carried out in Uttar Pradesh, India, where 74% of participants belonged to the low-income category (23). However, this was contrary to a study conducted in Poland, where only a quarter of the sample had limited income (24).

More than two-fifths of the sample have been diagnosed with breast cancer (BC) for 1–2 years, while a quarter of them have lived with BC for less than a year. This result aligns with the studies conducted by Al-Sharman et al. in Jordan (25) and Ośmiałowska et al. in Silesia, Poland (26); they provided supporting evidence for the results observed in the current study. The study sample revealed that more than three-quarters of women were in stages II and III, while only 5% were in the first stage, and none were in the zero stage. This can be explained as a delay in diagnosing early stages and is attributed to a lack of awareness and early examination/the absence of regular medical examinations among patients. The result is congruent with the study conducted by Alwan et al. in Baghdad, Iraq (27), seeking for comparison in the pathological and clinical characteristics of breast cancer in British and Iraqi women which found that more than three-quarters of the Iraqi patients were in stages II and III, while 60.8% of British women were in stage one.

In terms of surgery type, the "full Mastectomy" was the most common for approximately 80.9%, with low rates of lumpectomy and simple mastectomy observed among participants. This high prevalence of full mastectomy to either the need to prevent the spread of the tumour in the body or delays in identifying the disease. This type of surgery is the most preferred by surgeons in Kirkuk Governorate, as noted by Ali et al. (28), that total mastectomy was the most common treatment for breast cancer patients, regardless of the illness stage. In addition, similar to a previous study conducted by Yeo et al. (29) in China, which found nearly two-thirds of the breast cancer patients had a full mastectomy. This statistic stands in contrast to the results of a study in Spain, by Carmona-Bayonas et al. (30), and in France, by Lambertini et al. (31), where the lumpectomy rate was the highest among patients.

The patients in the present study were primarily treated with chemotherapy, which is consistent with the management of advanced stages. The second-most common treatment was biological, with a percentage of 32.6%. While the hormonal therapy had the lowest percentage. This finding aligns with the German study by Scholz et al. (32), which revealed that over half of the patients were undergoing chemotherapy. This was contrary to the findings of prior research conducted in Saudi Arabia by Al Zahrani et al. (33), which reported that more than half of the patients were on hormone therapy. Furthermore, our study participants had a low prevalence of smoking, as evidenced by the fact that the majority, 87.6% of women, reported being non-smokers, and a minor percentage of them were former smokers. In addition, more than two-thirds of the sample ate home-cooked meals.

This low rate of smoking may be explained as a cultural factor that plays a significant role, as smoking is considered socially unacceptable in some cultures, especially for women from Kirkuk society. This corresponds with the results reported in earlier research carried out in Saudi Arabia, which assessed the determinants of breast cancer and found that 82% of BC patients did not smoke (34).

The outcomes of the current study implied that the majority of women treated for BC showed a "moderate" level of health-related quality of life, as reported by 78.8% (n = 268). Low scores on the FACT-B scale in the present study highlight the impact of illness and treatment on various aspects of daily life; their quality of life also suffered from sociodemographic elements, including women's age, economic level, and cancer stage. The results are consistent with previous studies in Iraq, which revealed that the average of ratings for quality-of-life factors was also moderate (35). It was also consistent with studies conducted in Iraq, by Mustafa et al. (36), and in England, United Kingdom, by Reed et al. (37). Our study results exceeded the overall scores of a study conducted by Yang et al. (38) in China. However, multivariate analysis indicated that patients experiencing recurrence or metastasis reported a diminished overall quality of life, especially in the advanced stages of the disease, which exhibited lower health scores compared to those in the earlier stages.

The current study revealed statistically significant correlations between socioeconomic status and marital status and HR-QoL. Marital status exhibited a statistically substantial unfavourable correlation with overall health-related quality of life (HR-QoL) in women ($r = -0.218$, $P \leq 0.001$). Married women had the highest mean score for H-QoL, whereas divorced and separated women recorded significantly lower values. Conversely, other variables did not demonstrate statistically significant associations with H-QoL.

These results align with a previous study conducted in Central Asia and Poland, which emphasised a significant correlation between marital status and quality of life, indicating that married individuals reported a superior quality of life, particularly in the social dimension, which encompassed all people, but the pattern was most pronounced among women, consistent with our study findings. Moreover, socioeconomic position (assessed through education, work, and financial standing) was identified as a critical determinant. The synergistic effect of marriage and a robust socioeconomic status enhanced quality of life evaluations. A higher socioeconomic position in the married couple correlated with reduced depression scores. Elevated marital satisfaction was associated with diminished depression symptoms in both partners. Given that depression negatively impacts quality of life, the inverse correlation reinforces the idea that stable and fulfilling marriage partnerships enhance H-QoL ratings, particularly for women (39, 40).

The correlations between several clinical factors and overall Health-Related Quality of Life showed that the length of disease significantly influences HR-QoL, evidenced by a $p < 0.001$, with women experiencing less than one year of disease duration reporting the lowest mean HR-QoL score. The present cancer stage is substantially associated with health-related quality of life ($p < 0.003$), indicating a deterioration in quality of life as the cancer stage advances. The impacted breast, surgical type, and familial cancer history had no substantial correlation with overall health-related quality of life, as seen by non-significant p-values. Chemotherapy demonstrated a significant negative correlation with health-related quality of life, as evidenced by $p < 0.001$, while hormonal therapy yielded the greatest mean HR-QoL score. The smoking status exhibited no significant correlation with health-related quality of life. The source of daily food strongly correlated with HR-QoL ($p \leq 0.003$), with women dependent on home-cooked meals and a combination of home-cooked options reporting the highest HR-QoL ratings.

These results are similar to previous studies conducted in Maharashtra, India, Egypt, and Cairo, which indicated that individuals diagnosed for less than one year exhibited markedly lower HR-QoL scores and revealed that a shorter disease duration is associated with significantly lower HR-QoL. There was also a significant correlation between the progression of cancer stages and a decline in health-related quality of life. This finding implies a potential link between a decrease in health-related quality of life and more advanced disease stages. Additionally, affected breast sides showed no significant correlation with HR-QoL; however, there was a significant relationship between the treatment type and patients' quality of life. As predicted, discomfort, anorexia, nausea, emesis, and diarrhoea were correlated with chemotherapy treatments. It was reported that the quality of life is negatively impacted by chemotherapy. Conversely, individuals undergoing hormonal therapy demonstrated the greatest average HR-QoL scores (41, 42, 43).

As indicated by Konieczny et al. (44) in Poland, patients on chemotherapy exhibited significantly inferior HR-QoL outcomes, which aligns with the

current study that chemotherapy negatively impacts HR-QoL. Furthermore, the surgical type and familial cancer history did not significantly impact overall HR-QoL.

Conclusion

The study revealed that health-related quality of life is significantly influenced by factors like socioeconomic status, disease duration, cancer stage, and treatment type. Married women and those with higher socioeconomic status have a better quality of life, while advanced-stage patients and chemotherapy patients have lower QoL.

Strengths and Limitations of the Study

The strengths of this study include its contribution as the first research to provide essential baseline data about the quality of life of women with breast cancer in Kirkuk City. The inclusion of a relatively large sample size (340 women) enhances the statistical power and improves the generalizability of the findings within the local context. However, this study possesses certain drawbacks. The cross-sectional design limits the capacity to determine causal links between the identified variables and HRQOL outcomes. Furthermore, since data were collected from a single oncology centre, the findings may not be fully generalizable to all breast cancer patients across Iraq or in different healthcare settings.

List of Abbreviations

QOL: Quality of Life
HRQOL: Health Related Quality of Life
FACT-B: Functional Assessment of Cancer of Therapy-Breast

Declarations

The study received approval from the Scientific Committee of the College of Nursing, University of Kirkuk (Issue No. 1, 2024). Then, official approval to perform the study was obtained from the Kirkuk Directorate of Health to access the Oncology and Haematology Centre (Issue No. 889, 2024). Participants provided verbal agreement following an explanation of the objective of the study, as well as the confidentiality of their identity.

Availability of Data and Materials

All data generated or analysed during this study are included in this published article. Further details are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare no competing interests.

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Authors' Contributions

All authors contributed to the conception, design, data collection, analysis, interpretation, and drafting of the manuscript. All authors read and approved the final version.

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