Health-related Quality of Life Among Cervical Cancer Patients at Kenyatta National Hospital

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Research

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Abstract

Background: A previous systematic review showed that health-related quality of life (HRQoL) was adversely affected during treatment of cervical cancer, with a worsening global score. However, there was a lack of data in the study setting. Therefore, this study aimed to determine the HRQoL of cervical cancer patients at Kenyatta National Hospital.

Methods: A cross-sectional design of the study was employed among cervical cancer patients. All eligible cervical cancer patients during the study period were included in the study. Hence, a consecutive sample of 103 cervical cancer patients was involved in the study. Following consent, study participants were interviewed using The European Organization for Research and Treatment of Cancer Quality-of-Life Questionnaire 30 (EORTC QLQ-30) and Cervical Cancer Module CX24 (EORTC QLQ-CX24). The clinical characteristics and treatment regimens were collected by reviewing the medical records. Interpretation and linear transformation of the raw score of health-related quality of life were conducted as per EORTC QLQ 30 and EORTC QLQ-CX24 Scoring Manual. The data were entered and analyzed using the Statistical Package for Social Sciences version 20.0 software. Frequency tables mean, percentage, and figures were used to represent the data. Univariate and multivariate binary logistic regression analysis was employed to investigate the associated factors of health-related quality of life. A p-value of ≤ 0.05 was considered statistically significant.

Results: The mean age of the participant population was found to be 55.8 ± 5.6 years. Most of the study participants had stage III cervical cancer (56.3%) and without comorbidities (65%). The mean score of the global health status was 41.99. The physical functioning, cognitive functioning, and financial difficulties mean scores were 71.6, 73.3, and 93.5, respectively. Under the symptom scale, nausea and vomiting, pain, and appetite loss had mean scores of 70.1, 67.2, and 66.0, respectively. The overall quality of life data showed 69% of study participants had poor quality of life while 31% of study participants had good quality of life. Patients with early-stage disease (stage I and II) were 7.3 times (AOR = 7.3, 95% CI = 2.4 – 21.7, p = 0.000) more likely to have a good quality of life than patients with advanced-stage disease. Patients with no comorbidities were 3.1 times (COR = 3.1, 95% CI = 1.1 – 9.1, p = 0.037) more likely to have a good quality of life than patients with comorbidities.

Conclusions: The overall health-related quality of life among cervical cancer patients was poor in the study setting. Advanced stage of disease and presence of comorbidities were the significant predictors of poor quality of life.

Background

Cancer is the central and most cardinal cause of morbidity and mortality worldwide. According to the World Health Organization (WHO) 2018 report, cancer was the second leading cause of death, causing an estimated 9.6 million deaths (1). The Catalan Institute of Oncology and the International Agency for Research in Cancer Information Centre on Human Papilloma Virus (HPV) and cancer approximate that

every year 5250 females are diagnosed with cervical cancer, and 3286 dies from the condition (2). Global Cancer Incidence, Mortality and Prevalence databases released in 2018 stated that ten years later, cervical cancer persists in being a major health issue, graded as the fourth most prevalent type of cancer and a significant cause of mortality among women (3).

In underdeveloped nations, cervical cancer is the most prevalent type of cancer. Persistent HPV infections are the root cause of most cervical cancer (2) and are responsible for 99.7% of cervical cancer cases (4). The largest preponderance of HPV infections is seen in the Sub-Saharan Africa female population (5). According to a WHO report, 33 per 100,000 women aged between 15 and 44 in Kenya have cervical cancer, and 22 per 100,000 dies from the condition (1).

The preponderance of cervical cancer in Kenya can be imputed to numerous factors, but most importantly, the limited access to screening and prevention practices (4) and decreased immunity due to the significant prevalence of HIV infections (6). The limited access to screening and prevention can further notably be attributed to low education levels, a mediocre health system, and a general lack of awareness among Kenyan women (7).

Health-related Quality of Life is a concept that includes various aspects of well-being, encompassing an individual's physical, emotional, mental, and social functioning (8). The HRQoL can be attributed to the success or failure of the treatment and the type of treatment utilized to manage the patient (9). On that account, it is an effective tool for gauging the standard of therapy used in cervical cancer and looking at areas that can be improved in the prevention and management to improve the patient's overall prognosis.

A previous systematic review showed that HRQoL was adversely affected during treatment of cervical cancer with a worsening global score but improved 3-6 months after treatment. Besides, the review also reported that the symptoms scale of quality of life remained worse for an extended period after curative treatment of early and locally advanced stages of cervical cancer (10). The quality of life in cervical cancer patients may be predisposed to copious factors, most of which either pertain to cancer itself or the treatment modalities applied. These may include the stage of the disease, time of diagnosis, and the category of treatment. Nevertheless, a few independent factors may also come into play that may impact quality of life and encompass socio-demographic characteristics such as age, education levels, occupation, area of residence, and income (11).

Studies on gynecological cancer patients have shown that early stages (stages I and II) were associated with a more improved quality of life as compared to advanced stages (stages III and IV) (12). Besides, another study also identified that advanced stage patients experienced more issues with aspects of nausea and vomiting, loss of appetite, and issues of financial nature. Regarding therapeutic modalities utilized, patients who underwent surgery observed better outcomes and overall quality of life than patients who underwent chemotherapy and radiotherapy (11).

Despite few studies conducted, the association between specific treatment modalities and HRQoL has not been well established (13–15). Therefore, this study aimed to determine the HRQoL of cervical cancer patients at Kenyatta National Hospital.

Methods

Study design, setting, and period

A cross-sectional design of the study was employed to assess HRQoL among cervical cancer patients at the Cancer Treatment Center of Kenyatta National Hospital. The hospital is a teaching and referral hospital founded in 1901, located in Nairobi, Kenya, on Hospital Road. The hospital has a capacity of 1800 beds and provides care and management to cancer patients. The study was conducted from March 2021 to April 2021.

Target population

The target population comprised of female patients with cervical cancer who were receiving therapy at the Cancer Treatment Center of Kenyatta National Hospital.

Eligibility criteria

Inclusion criteria

- Adult female patients (18 years and above) with a confirmed diagnosis of cervical cancer
- Patients undergoing therapy for cervical cancer or have completed at least one form of therapy
- Conscious patients who can talk during the data collection
- Patients who were willing to participate in the study.
- Patients with complete medical records of their treatment regimen

Exclusion criteria

Patients who did not consent, seriously ill, and had incomplete medical records of treatment regimens were excluded from the study.

Sample size determination

All eligible cervical cancer patients who were on treatment during the study period were included in the study. Hence, a consecutive sample of 103 cervical cancer patients was involved in the study.

Research instruments

The first section of the data collection instrument comprised of the consent form, socio-demographics, clinical characteristics, and treatment regimens. The second section of the instrument consisted of EORTC QLQ-C30 (16) and EORTC QLQ-X24 to assess the HRQoL of cervical cancer patients (17).

Pretesting

A pretest study was conducted in 10% of the sample population by the principal investigator. The data from this study were analyzed and used to establish imperative rectifications and modifications on the questionnaires before the actual period of data collection.

Data collection techniques

The principal investigator and research assistants (two Oncology Nurses) were involved in the data collection. Appropriate training was given to the data collectors by the investigators before the commencement of the actual study. During each day of the data collection, the study participants were given a brief description of the objective of the study. Then, the patients were requested to sign a written consent to declare their participation in the study. The socio-demographics, clinical characteristics and treatment regimens were collected by reviewing the medical records of the patients. The quality of life data was collecting by interviewing the patients in the private rooms in the hospital. Interpretation and linear transformation of the raw score of health-related quality of life were conducted as per EORTC QLQ 30 (16) and EORTC QLQ-CX24 Scoring Manual (17).

Study variables

Dependent variables

- Health-related quality of life

Independent variables

- Sociodemographic variables such as age, marital status, level of education, area of residence, smoking, drinking, income, and occupation.
- Patient variables such as treatment modalities used, stage of cancer, time of diagnosis, and types and number of comorbid conditions present.

Data analysis

The raw score of quality of life data was entered in Micosoft excel and transformed to a scale range of 0-100 as per the standard scoring procedure of EORTC QLQ 30 and EORTC QLQ-CX24 Scoring Manual. Then the transformed data of quality of life and other sociodemographic and clinical characteristics data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0 software. Frequency tables, mean, percentage, and figures were used to represent the collected data. Univariate and multivariate binary logistic regression analysis was employed to investigate the associated factors of health-related quality of life. A p-value of ≤ 0.05 was considered statistically significant.

Operational definition of terms

Good health-related quality of life: A high mean score (≥60) on the functional scale and a low mean score (≤60) on the symptom scale of the European Organization for Research and Treatment of Cancer module/ Cervical cancer module questionnaire.

Poor health-related quality of life: Represented by a low mean score (≤60) on the functional scale and a high mean score (≥60) on the symptom scale of the European Organization for Research and Treatment of Cancer module/ Cervical cancer module questionnaire.

Results

Sociodemographic characteristics of the study participants

This study was conducted on 103 cervical cancer patients. The study participants' mean age was 55.8 ± 5.6 years, and most of the patients were principally under the age of 60 years (78, 75.7%). Out of the total study population, 78 (75.7%) participants were married, and 74 (71.8%) participants were from Nairobi county. Fifty-one (49.5%) participants had been through secondary education, and only 2 (1.9%) were illiterate. The majority (79, 76.7%) of the study participants were unemployed. All the included (100%) participants did not smoke, and 96 (93.2%) did not drink alcohol (Table 1).

Table 1: Sociodemographic characteristics of the study participants

Variables	Frequency	Percent
Age (years)		
<60 years	78	75.7
≥60 years	25	24.3
Marital status		
Single	25	24.3
Married	78	75.7
County of residence		
Nairobi	74	71.8
Meru	11	10.7
Kiambu	6	5.8
Mombasa	2	1.9
Kitui	5	4.9
Laikipia	4	3.9
Murang'a	1	1
Level of education		
Illiterate	2	1.9
Primary	49	47.6
Secondary	51	49.5
Diploma	1	1
Occupation		
Unemployed	79	76.7
Employed	24	23.3
Smoking		
Smoke	0	0
Do not smoke	103	100
Drinking		
Drink alcohol	7	6.8
Do not drink alcohol	96	93.2

Clinical characteristics and treatment regimens of the study participants

As shown in Fig.1, 68 (66%) study participants had an advanced-stage disease while only 35 (34%) participants had early-stage disease.

This study further illustrated that most of the study participants had stage III cervical cancer (58, 56.3%), while 35 (34%) participants had stage II cervical cancer, and only 10 (9.7%) participants had stage IV cervical cancer (Fig.2).

As illustrated in Fig. 3, a large population of the study participants was seen to be without comorbidities (67, 65%). In contrast, 36 (35%) participants were observed to have comorbidities.

Among the observed comorbidities, 18 (17.5%) participants had hypertension, while 5 (4.9%), 6 (5.8%), 5 (4.9%), and 2 (1.9%) participants had a retroviral disease, asthma, diabetes, and ulcers, respectively (Fig.4).

The most common treatment modality used was a combination of weekly chemotherapy and radiotherapy using Cisplatin 40mg (88, 85.4%). Chemotherapy alone using Cisplatin 40mg was the second most common treatment modality used (10, 9.7%), and radiotherapy alone (3, 2.9%) and surgical procedures (2, 1.9%) were the least common treatment modalities used to treat cervical cancer (Fig.5).

Health-related quality of life among study participants

The mean score of the global health status was 41.99 ± 31.4. The physical functioning, cognitive functioning, and financial difficulties mean scores were 71.6, 73.3, and 93.5, respectively, while the mean scores for emotional and social functioning corresponded to 49.5 and 34.1. Under symptom scale, nausea and vomiting, pain, and appetite loss had mean scores of 70.1, 67.2, and 66.0, respectively, while insomnia, constipation, and diarrhea had mean scores of 27.5, 19.7, and 16.8, respectively. Sexual worry had a mean score of 73.5, and vaginal functioning had a mean score of 51.5. Sexual enjoyment had a mean score of 16.5, and sexual activity had a mean score of 5.2 (Table 2).

Table 2: Health-related quality of life functioning among cervical cancer patients

Questionnaire	Quality of life scale/item	Mean± (SD)
	Global health status / QoL	
EORTC QLQ-C30	Global health status	41.99 ± 31.4
	Functional scales	
	Physical functioning	71.6 ± 23.6
	Role functioning	59.9 ± 33.6
	Emotional functioning	49.5 ± 35.96
	Cognitive functioning	73.3 ± 28.2
	Social functioning	34.1 ± 39.3
	Symptom scales / items	
	Fatigue	63.2 ± 25.1
	Nausea and vomiting	70.1 ± 28.9
	Pain	67.2 ± 21.6
	Dyspnoea	44.7 ± 39.5
	Insomnia	27.5 ± 29.7
	Appetite loss	66.0 ± 30.6
	Constipation	19.7 ± 26.6
	Diarrhea	16.8 ± 30.1
	Financial difficulties	93.5 ± 22.4
EORTC QLQ-CX24	**Symptom scales/items**	
	Symptom experience	35.6 ± 22.2
	Body image	40.1 ± 39.6
	Sexual/Vaginal functioning	51.5 ± 13.9
	Lymphoedema	35.6 ± 36.2
	Peripheral neuropathy	43.7 ± 33.3
	Menopausal symptoms	43.0 ± 34.5
	Sexual worry	73.5 ± 43.1
	Functional items	
	Sexual activity	5.2 ± 15.3

	Sexual enjoyment	16.5 ± 17.2

EORTC QLQ 30: European Organisation for Research and Treatment of Cancer quality of life questionnaire, EORTC QLQ-CX24: European Organisation for Research and Treatment of Cancer quality of life questionnaire for Cervical Cancer, QoL: Quality of life, SD: Standard deviation

The present study showed that 69% of study participants had poor overall HRQoL while 31% of study participants had good HRQoL (Fig. 6).

Factors associated with predicting health-related quality of life among cervical cancer patients

The univariate and multivariate binary logistic regression analysis revealed that patients with early-stage disease (stage I and II) were 7.3 times (AOR = 7.3, 95% CI = 2.4 – 21.7, p = 0.000) more likely to have a good quality of life as compared to patients with advanced-stage disease. Patients with no comorbidities present were 3.1 times (COR = 3.1, 95% CI = 1.1 – 9.1, p = 0.037) more likely to have a good quality of life than patients with comorbidities. Nonetheless, the other parameters did not significantly affect health-related quality of life among cervical cancer patients (Table 3).

Table 3: univariate and multivariate binary logistic regression analysis of factors associated with health-related quality of life

Variable	Univariate analysis		Multivariate analysis	
	COR (95% CI)	P-value	AOR (95% CI)	P-value
Age (in years)				
≥60 years	1		1	
<60 years	2.1(0.7 – 6.3)	0.175	2.6(0.7 – 9.7)	0.164
Stage of disease				
Advanced stage (stage III &IV)	1		1	
Early-stage (stage I and II)	6.2(2.5 – 15.5)	0.000*	7.3(2.4 – 21.7)	0.000*
Marital status				
Married	1		1	
Single	0.63(0.23 – 1.8)	0.383	2.3(0.6 – 8.4)	0.222
Occupation				
Employed	1		1	
Unemployed	0.87(0.3 – 2.3)	0.784	0.8(0.2 – 2.5)	0.674
Residence				
Non-Nairobi resident	1		1	
Nairobi resident	1.6(0.6 – 4.3)	0.344	1(0.3 – 3.5)	0.994
Comorbidities				
Comorbidities present	1		1	
Comorbidities absent	3.1(1.1 – 9.1)	0.037*	1.9(0.5 – 6.98)	0.341
Alcohol consumption				
Drink alcohol	1		1	
Does not drink alcohol	3.2(0.7 – 15.4)	0.140	2.2(0.4 – 12.3)	0.375

COR= Crude odds ratio, AOR= Adjusted odds ratio, 95% CI= 95% confidence interval, *Statistically significant: P value ≤ 0.05.

Discussion

This study showed that the mean age of the participant population was 55.8 ± 5.6 years, and an overriding percentage of the participants (75.7%) were under the age of 60 years. This finding reasonably

corresponded to other related studies by Owenga and Araya *et al*. (18), which showed that most patients with cervical carcinoma were aged between 25 and 54 years. This finding may be attributable to cervical cancer risk factors, such as the predominance of the exceedingly oncogenic subtypes of the HPV virus (19).

This study indicated that most participants had advanced-stage cervical cancer (66%) compared to early-stage disease (34%). A large population (56.3%) had stage III cancer, while 34% had stage II cancer and 9.7% had stage IV disease. Similary, a previous study also reported that most patients had advanced-stage disease (73%) (15). This high percentage of an advanced stage in our setting may be due to an insufficiency in awareness of early screening methods among Kenyan women. Despite achieving at least a secondary school certificate (49.5%), the perception of high susceptibility and preponderance of cervical cancer is lacklustre (14). Therefore, this would effectuate the incapability to perceive and detect some of the early symptoms that may lead to an early diagnosis.

The majority of the study population did not have any comorbidities (65%), whereas 35% had comorbidities, with hypertension ranking the highest (17.5%), followed by asthma (5.8%), HIV (4.9%), and diabetes (4.9%). This is in line with a study by Dos Santos *et al.* (20), which delineated that 48.3% of the participants did not have any comorbidities present. Contrastingly, among patients with comorbidities, hypertension (43.6%) and diabetes mellitus (21.3%) were the most prevalent.

The most typical treatment modality employed among cervical cancer patients was chemoradiation therapy using cisplatin 40mg (85.4%). In contrast, chemotherapy alone (9.7%), radiation therapy (2.9%), and surgical intervention (1.9%) were the least utilized therapeutic options. This is contrary to a study done by Araya *et al.* (18), which stated that the most common treatment modality used was radiotherapy (42.3%). Furthermore, another study by Owenga revealed that chemotherapy (10%) and total hysterectomy (9%) were the most common treatment as compared to chemoradiation therapy (3%) (15).

A bulk of the study population showed positive means scores for physical functioning (71.6 ± 23.6) and cognitive functioning (73.3 ± 28.2). This conceivably could be imputable to the younger age among the participants. Role functioning had an adequately good mean score of 59.9 ± 33.6, whereas emotional functioning (49.5 ± 35.96) and social functioning (34.1 ± 39.3) had sufficiently poor scores. Poor emotional and social functioning was attributable to symptoms such as depression, worry, and irritability, alongside a decline in social activities. This may have been promoted by the record unemployment rates (76.7%) among the participants, which needless to say, points to low incomes, and this highly influences emotional and social functions (21). This was contrasting in Owenga's study (15), which demonstrated positive emotional and social functionality among cervical cancer patients shielded by strong religious beliefs.

On the symptoms scale, nausea and vomiting were the most experienced symptom among the study population, with a mean score of 70.1 ± 28.9. Nausea and vomiting are among the most common side effects of cisplatin therapy, and therefore, it was the most probable cause of the high incidence (22). Pain (67.2 ± 21.6), appetite loss (66 ± 30.6), and fatigue (63.2 ± 25.1) were also experienced by a large

proportion of the study participants. This was in congruence with the Araya *et al* study (18), which demonstrated high mean scores on pain, fatigue, and appetite loss. Financial difficulties among study participants had an exceptionally high mean score of 93.5 ± 22.4. This may have been a consequence of most participants being unemployed (76.7%), which insinuates inadequate wages.

The findings indicated that sexual worry was high among participants with a mean score of 73.5 ± 43.1, and consequently, sexual activity was remarkably low (5.2 ± 15.3). Most patients acknowledged that they were afraid to participate in any form of sexual activity due to pain, vaginal shortness, and vaginal narrowing or were too shy to engage in talks about it. This is in agreement with the Brazilian study (20), which indicated sexual performance scores were negative among participants. Besides sexual symptoms, lymphoedema, peripheral neuropathy, and menopausal symptoms had comparably lower mean scores of 35.6 ± 36.2, 43.7 ± 33.3, and 43 ± 34.5, respectively. This is consistent with a Chinese study (11).

The global health status among study participants was low, giving a mean score of 41.99 ± 31.4. Correspondingly, the HRQoL among study participants was largely poor (69%), with only 31% having good HRQoL. The poor HQoL can be attributed to negative scores of emotional functioning, social functioning, sexual functioning, financial difficulties, and some of the symptom experience. This is consistent with Araya *et al*., which showed a global health status score of 48.3 ± 23.77 (18). Participants with early-stage disease were 7.3 (AOR = 7.3, 95% CI = 2.4–21.7, p = 0.000) times more likely to have good HQoL as compared to patients with advanced-stage disease. There was also a positive link between the absence of comorbidities and good HQoL (COR = 3.1, 95% CI = 1.1–9.1, p = 0.037) compared to patients with comorbidities present. Other factors such as age, marital status, occupation, residence, and alcohol consumption were not statistically significant predictors of HQoL among cervical cancer patients. This is unlike the study done by Owenga (15), which demonstrated a statistically significant link between age, marital status, education, and overall HRQoL.

Conclusions

The overall health-related quality of life among cervical cancer patients was poor (69%) in our setting, with a mean score of 41.99 ± 31.4. Emotional, social, and sexual well-being, alongside financial difficulties and some symptoms such as nausea and vomiting, were the most prevalent factors contributing to poor quality of life. Predictors of poor quality of life that were statistically significant were discerned to be the advanced stage of the disease and presence of comorbidities. Therefore, counseling measures alongside pharmacological treatment modalities should be adequately implemented to enhance emotional and social well-being.

Abbreviations

AOR: Adjusted odds ratio

COR: Crude odds ratio

HRQoL: Health related quality of life

EORTC QLQ-30: The European Organization for Research and Treatment of Cancer Quality-of-Life Questionnaire 30

EORTC QLQ-CX24: : The European Organization for Research and Treatment of Cancer Quality-of-Life Questionnaire Cervical Cancer Module CX24

Declarations

Ethics approval and consent to participate

Authorization to conduct the study was acquired from the Kenyatta National Hospital/University of Nairobi Ethics and Research Committee (Approval number: UP18/01/2021). Clearance to use the questionnaires was granted by the EORTC research group following an e-mail to request for them. In addition to this, the confidentiality of patient information was guaranteed and maintained as anonymous during data collection. Written informed consent was obtained from all the study participants to involve the study.

Consent for publication

Written informed consent was obtained from all the study participants to publish the study's findings with anonymity.

Availability of data and material

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no conflicts of interest.

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There was no funding to conduct this study.

Authors' contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by MSA and AD. The first draft of the manuscript was written by MSA, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Figures

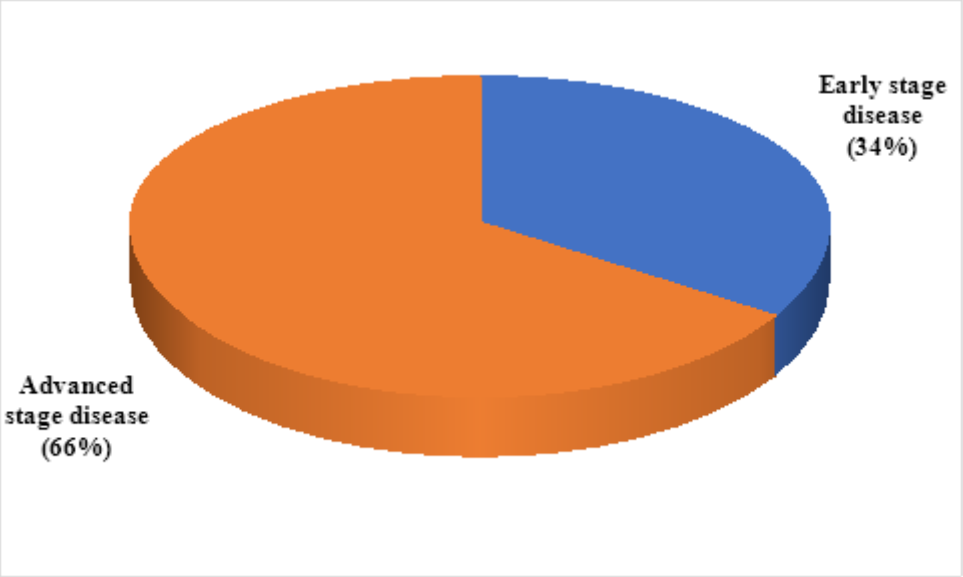

Figure 1

Staging of disease among participants

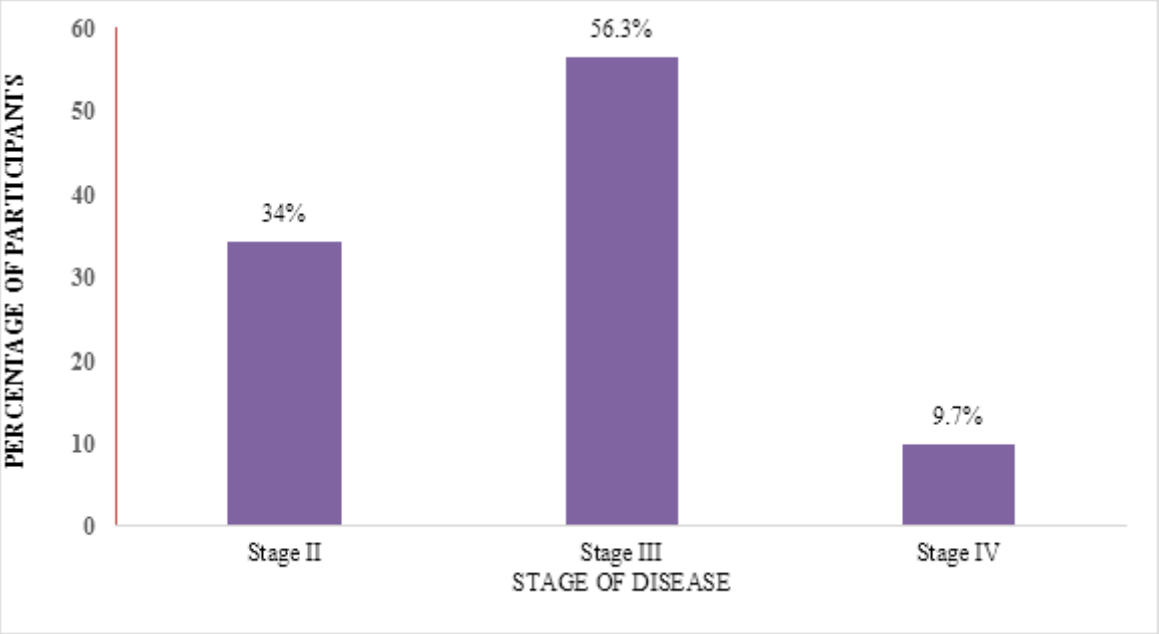

Figure 2

Stages of cervical cancer found among study participants

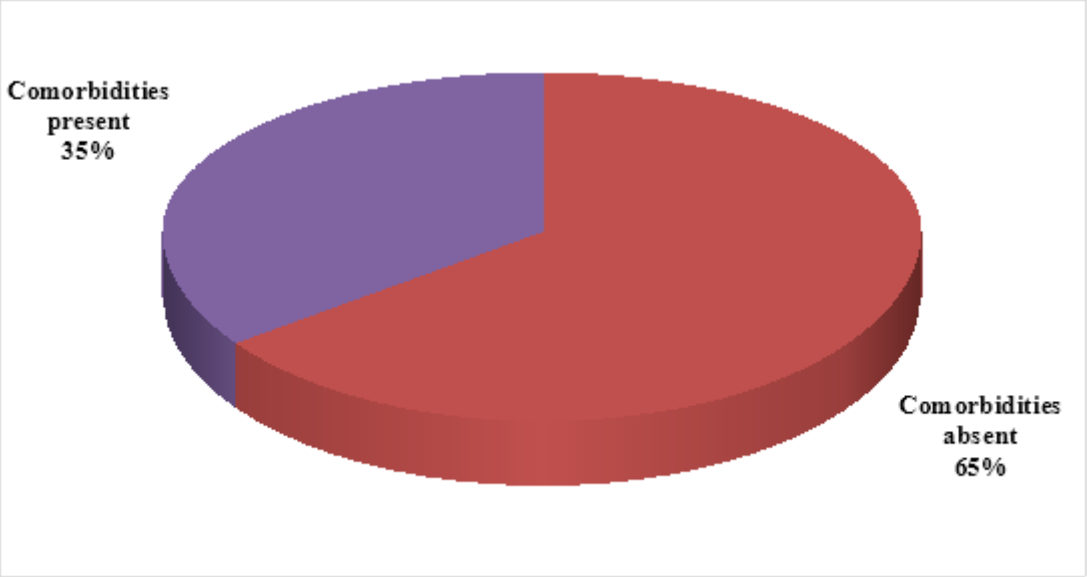

Figure 3

Presence of comorbidities among cervical cancer patients

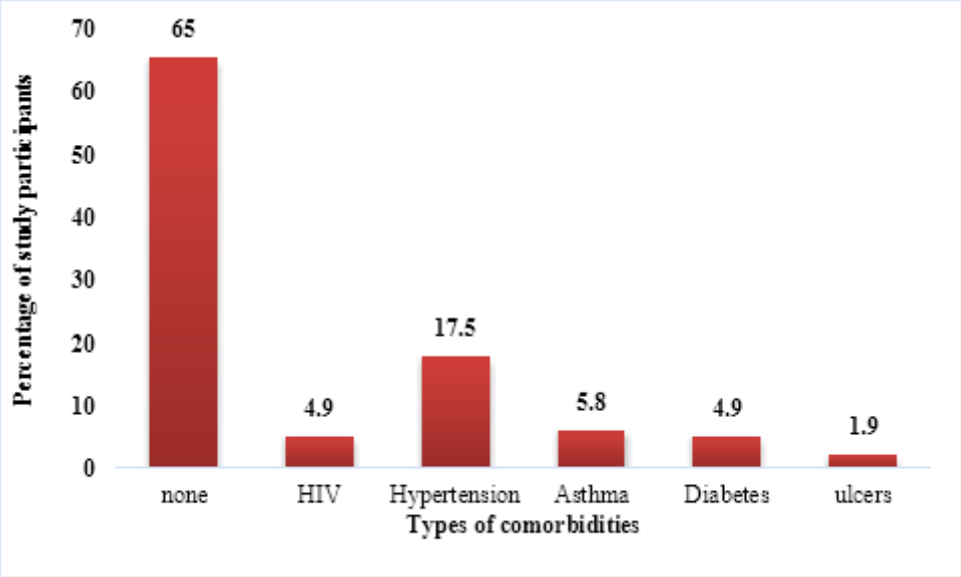

Figure 4

Types of comorbidities present among the study participants

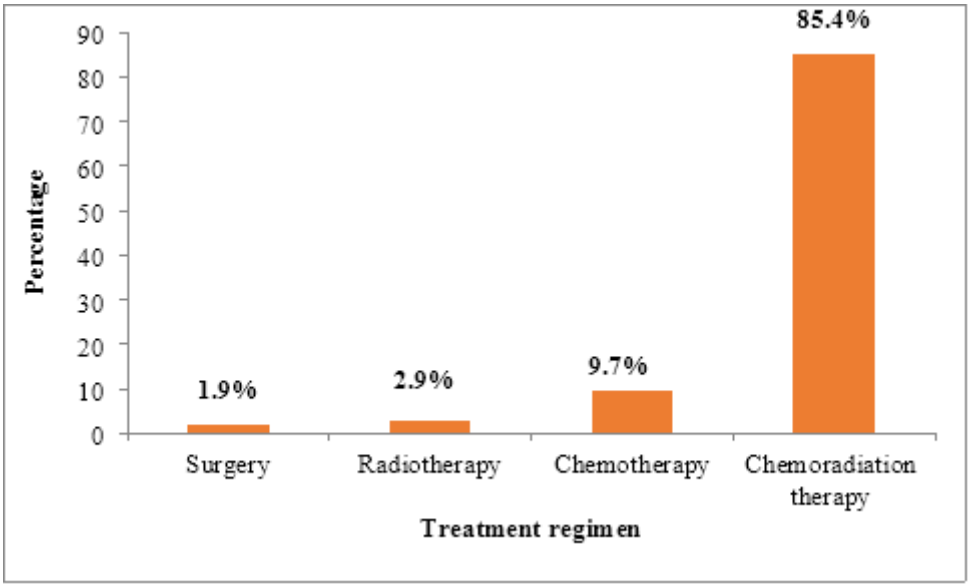

Figure 5

Treatment modalities used in cervical cancer management

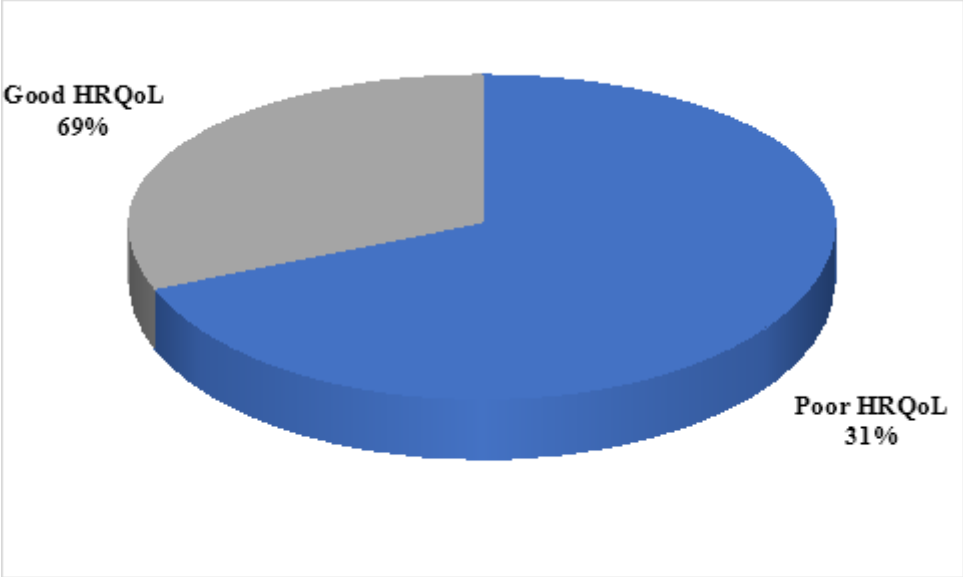

Figure 6

Overall health-related quality of life among study participants