
Assessment of Health Related Quality of Life in Cervical Cancer Patients in Western Kenya

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Abstract: Health Related Quality of Life (HRQoL) is an important health outcome in the holistic management of patients especially those suffering from life limiting conditions such as cervical cancer. In Kenya, Cervical cancer is the most frequent cancer among women. However, little is known and documented on HRQoL of cervical cancer patients. This study assessed HRQoL of cervical cancer patients in western Kenya. A cross-sectional study involving 334 cervical cancer patients was conducted in Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) in Kisumu from September 2014 to February 2015. FACT-Cx (The Functional Assessment of Chronic Illness Therapy –for measuring Quality of Life in cervical cancer patients) Version 4 and a structured questionnaire were used to collect data. Quantitative data was analyzed using Statistical Package for Social Scientists (SPSS) Version 20 and Statistical Application Software (SAS) version 9.2 at a statistical significance of $P \leq 0.05$, descriptive and inferential statistics were performed. The mean HRQoL was 35.35 (SD=13.21). More than half of the respondents experienced poor functional and physical wellbeing, 221 (66%) and 201 (60%) respectively and no patient experienced good functional and physical wellbeing. While 189 (57%) experienced fair overall quality of life. Multiple cumulative logistic regression analysis between cancer stage and treatment had statistically significant association with overall quality of life ($X^2 = 105.34$ and 70.72 ; with $df=3$ and 6 ; p -values = 0.0001 and 0.0001 , respectively); also between age, marital status, level of education and religion showed positive influence on overall quality of life except for religion ($X^2 = 21, 11, 113$ and 4 with $df=3$ for all and p -values = $0.0001, 0.0121, 0.0001, 0.2563$ respectively). Cervical cancer patients do fairly better with emotional and social wellbeing, while they experience poor functional and physical wellbeing due to large proportion of patients presenting at stage IV and III of the disease. There is a need to include HRQoL assessment in routine management of cervical cancer patients to enhance their quality of life.

Keywords: Cervical Cancer, Health Related Quality of Life, Kenya

1. Introduction

Cervical cancer is the leading cause of mortality and morbidity in sub-Saharan Africa followed by breast cancer [1]. This may be attributed to low screening rates reported in Africa where only 5% of women undergo screening for cervical cancer compared to over 40% in developed countries, and 70% or higher in countries that have shown marked reduction in incidence and prevalence of cervical cancer [2]. This is occasioned by low awareness and fear for being screen positive in the face of unreliable access to treatment [3].

In Kenya, Cervical cancer is the leading female cancer in

both incidence and mortality rates at 40.1 and 21.8 respectively [1]. Estimated annual number of cervical cancer cases in Kenya is 2454 while the annual number of deaths due to cervical cancer is 1676. It is projected that by the year 2025, the number of new annual cervical cancer cases in Kenya will reach 4261 [2].

Health Related Quality of life (HRQoL) is the subjective perception of the impact of disease and treatment on the health status of an individual as regards to physical, psychological, social and functional well-being. Quality of life in patients with life threatening diseases has been measured in many countries all over the world [4, 5].

Measuring HRQoL among patients with life threatening

diseases is required in order to understand the degree to which their lives and well-being have been affected by disease [6]. In the developed world, several tools for assessing health related quality of life have been developed and HRQoL assessment have been made a routine practice in management of life threatening diseases including cancers [4, 5, 7].

In Sub-Saharan Africa, Kenya included, majority of women present at late stages with invasive and advanced cervical cancer mainly due to low screening and inadequate access to treatment [2, 3, 8]. This require constant evaluation of quality of life as cancer has been associated with negative impact on QoL [5, 9, 10].

Fewer studies have been done on HRQoL in Sub-Saharan Africa. Tadele [7], evaluated HRQoL of adult cancer patients in Adis Ababa Ethiopia using EORTC QOL C-30. The HRQoL results from this study indicated lower role, emotional and social wellbeing among cancer patients. The study recommended need for HRQoL assessment as a routine practice for cancer management. Contrastingly, Masika, Wettergren [11], reported low physical and social HRQoL with high emotional HRQoL among cancer patients in Tanzania. This study like Tadele [7], did not focus on cervical cancer and used EORTC QOL C-30 which is a generic tool for all cancers and therefore did not capture issues unique to cervical cancer. Muliira, Salas [5], conducted systematic review on QoL among female cancer survivors in Africa and found that socio-demographic factors such as age, education, income and advanced cancer stage are associated with QoL. Moreover, Fadodun, Ohaeri [12] assessed HRQoL of women diagnosed with cervical cancer in Nigeria using EORTC QLQ30 and EORTC CX24), the study results showed low role functioning and social functioning among the participants. HRQoL status of cervical cancer patients in Kenya is not known yet it is the cancer of public health importance among women in Kenya.

This study was set to establish HRQoL of cervical cancer patients with the aim of using this information to design evidence based interventions for improving HRQoL of cervical cancer patients in Kenya.

2. Materials and Methods

2.1. Study Design

This was a hospital based cross-sectional descriptive study.

2.2. Study Setting

The study was conducted at JOOTRH in Kisumu from September 2014 to February 2015. JOOTRH is a referral hospital serving a catchment area with a population of more than 5 million people in more than 10 counties in the western region of Kenya. The hospital serves an area with some of the worst health indicators in the country including high prevalence of HIV infection (15.4%) which is greater than twice that of the national (7.1%) prevalence [13]. JOOTRH is the referral hospital for cancer patients in western part of

Kenya. At the time of this study, total in-patient cervical cancer admissions were 681 and 735 in 2014 and 2015 respectively. Facilities available for management of cervical cancer were cryotherapy and Loop Electrosurgical Excision Procedure (LEEP) equipment. Radiotherapy machine was available but was not operational. The facility did not have an oncologist, there were three palliative care nurses, a pathologist (mainly conducting biopsies) and gynecologists who staged cervical cancer and conducted surgery where appropriate.

2.3. Study Participants

The study participants consisted of cervical cancer patients who were over 18 years visiting JOOTRH or referred to JOOTRH for further treatment or palliative care services. The eligible respondents were sourced from palliative care clinics, oncology unit, and obstetric and gynecological unit within JOOTRH.

2.4. Data Collection Tools

FACT-Cx(*The Functional Assessment of Chronic Illness Therapy –for measuring Quality of Life in cervical cancer patients*) Version 4 was used to collect data for measuring quality of life of cervical cancer patients. FACT-Cx is a 42-item questionnaire composed of 5 multi-item domain subscales: physical well-being, social/family well-being, emotional well-being, functional well-being and additional concerns that are specific to cervical cancer.

Structured Questionnaire

This was used to collect patients' socio- demographic and clinical data.

2.5. Sample Size Determination

To calculate sample size the formula by Fischer *et al.*, (1998) recommended for social science research was used.

2.6. Sampling Design

The sampling strategy involved purposive sequential enrolment of patients with histologically proven cervical cancer as they became available at the facility till the required sample size was reached. The healthcare providers in charge of the patients and palliative care specialist helped identify patients based on information in the patient files then referred them to the researcher who confirmed their eligibility and proceeded to seek consent from each of them. This was done until the desired sample size (334) was achieved.

2.7. Research Procedure

FACT-Cx Version 4 and a Structured Questionnaire were administered to the recruited patients by the researcher and research assistants. The researcher and the health care team worked out a programme on how the researcher could access the respondents without putting any strain on the respondents. The participants answered the questionnaires by

themselves except for some 21 (6.3%) who needed help and were assisted by the researcher.

2.8. Data Management and Analysis

Quantitative data from HRQoL assessment tool FACT-Cx Version 4 and a structured questionnaire were coded and entered in statistical computer packages- SPSS version 20 and SAS version 9.2.

In order to determine quality of life from FACT-Cx assessment tool, FACT-Cx Administration and Scoring

$$\frac{\text{PWB score}}{\text{(PWB score)}} + \frac{\text{SWB score}}{\text{(SWB score)}} + \frac{\text{EWB score}}{\text{(EWB score)}} + \frac{\text{FWB score}}{\text{(FWB score)}} + \frac{\text{CxCS score}}{\text{(CxCS score)}} = \text{FACT-Cx Total score}$$

Figure 1. FACT-Cx Scoring Formular (version 4).

Domain scores in FACT-Cx which involves; physical well-being (PWB), social/family well-being (SWB), emotional well-being (EWB), functional well-being (PWB) and additional concerns for cervical cancer (CxCS). Were recorded so that total scores ranging from low to high reflected poor, fair, moderate, and good well-being and overall quality of life (QoL) status. The scores were graded as follows:

0-25% - Poor; 26-50% - Fair; 51-75% - Moderate; 76-100% - Good.

Data was entered into SPSS version 20 and presented in tables. Descriptive statistics was done to analyze how cervical cancer patients differed in their wellbeing status. Pearson chi-square was used to test association between cervical cancer stage and physical wellbeing. Multiple cumulative logistic regression analysis was conducted to establish the association of cervical cancer stage and treatment received on overall quality of life; socio-demographic characteristics such as age, marital status, education and religion on overall quality of life; cervical cancer stage and treatment received by patients on their HRQoL. Statistical significance was tested at $p \leq 0.05$.

2.9. Ethical Consideration

Ethical clearance was obtained from JOOTRH Ethical Review Board, reference number- (ERC.1B/VOL.1/135).

Guidelines were used to calculate HRQoL Status which was then graded as poor, fair, moderate and good based on individual patient scores for easy interpretation. The raw scores were also transformed to scores ranging from 0 to 100; these were also entered in SPSS version 20 for purposes of calculating means and standard deviations (SD) of physical, emotional, social and overall quality of life (QoL) of the patients.

To Derive a FACT-Cx total score:

Score range: 0-168

Authority to use FACT Cx version 4 questionnaire was obtained through permission letter received from Dr. David Cella. The nature and purpose of the study was explained to the potential participants verbally and in writing (if the patient could read) to enable them make informed consent as a basis for enrollment. Participation was voluntary, confidentiality anonymity was guaranteed. Individual written consent was obtained from each participant before being enrolled into the study. Patients who were unable to write were asked to sign through thumb stamping.

2.10. Quality Assurance

Pilot survey was conducted at the neighboring Kisumu East sub-county hospital. Content validity was assessed and approved by palliative care team at Kisumu hospice who are competent and experienced in quality of life measures.

3. Results

3.1. Socio-Demographic Characteristics of Respondents

A total of 334 cervical cancer patients participated in the study. A larger proportion 114 (34%) were aged between 36-46 years. More than half (53%) were widowed, and only 30 (9%) were formally employed.

Table 1. Socio-Demographic Characteristics of Respondents.

Characteristics	Categories	n (%)
Age group	18-35	93 (28)
	36-46	114 (34)
	47-57	52 (16)
	58 and above	75 (22)
Marital status	Married	104 (31)
	Divorced/separated	31 (10)
	Widowed	178 (53)
	Never married/ single	21 (6)
Level of formal education	None	43 (13)
	Primary	179 (54)
	Secondary	62 (18)
	Tertiary	50 (15)
Religion		

Characteristics	Categories	n (%)
Family's main source income	Christians	324 (97)
	Muslim	10 (3)
	Small scale farming	159 (48)
	Small scale business	145 (43)
	Formal employment	30 (9)
Total		334 (100)

Key: None- respondent did not undergo formal education at all.

Primary-responder attained primary education of any level.

Secondary- respondent attained secondary education of any level.

Tertiary - respondent attained any training post-secondary education.

3.2. Clinical Characteristics

One seventy-nine (54%) of the respondents were at stage IV, and 63 (19%) at stage III.

Most of the respondents (63%) were (HIV) Positive while only 73 (22%) were negative.

One hundred and five (31%) of the patients were treated by blood transfusion and use of pain killers while only (9%) of the patients were treated by surgery and 42 (13%) by LEEP.

Table 2. Clinical Characteristics of Respondents.

Characteristics	Categories	n (%)
Cervical cancer stage	Stage I	52 (15)
	Stage II	40 (12)
	Stage III	63 (19)
	Stage IV	179 (54)
Cervical cancer screening	Yes	112 (33)
	No	222 (67)
HIV status	HIV Positive	209 (63)
	HIV Negative	73 (22)
	Don't know	52 (15)
Period of diagnosis	Less than a year ago	217 (65)
	More than a year ago	31 (9)
	Don't know	86 (26)
Treatment received	Chemotherapy	32 (10)
	Radiotherapy and chemotherapy	11 (3)
	Total hysterectomy	30 (9)
	Blood transfusion and pain killing	105 (31)
	Pain killing only	74 (22)
	Haematemics	40 (12)
	Conization (LEEP)	42 (13)
Total		334 (100)

3.3. Health Related Quality of Life Status of Respondents

More than half of the patients 201(60%) reported experiencing poor physical wellbeing while no patient experienced good physical wellbeing. The overall mean for physical wellbeing was =28.16 with SD = 20.445. More than half of patients in this study experienced fair 188(56%)

social/family well-being, the overall mean for social wellbeing was=37.34 with SD =17.26.

Majority of the patients experienced poor functional wellbeing 221(66%) the overall mean for functional wellbeing was=19.64 with SD=15.83. Overall mean for overall quality of life was=35.35 with SD= 13.211.

Table 3. Health Related Quality of life of Cervical Cancer Patients.

Domains of well being	Quality of life of cervical cancer patients				Total n (%)
	Poor n (%)	Fair n (%)	Moderate n (%)	Good n(%)	
Physical wellbeing	201 (60%)	72(22%)	61(18%)	0(0%)	334 (100%)
Emotional wellbeing	42 (13%)	112 (33%)	148(44%)	32(10%)	334 (100%)
Social/family well being	96 (29%)	188 (56%)	40(12%)	10(3%)	334 (100%)
Functional wellbeing	221 (66%)	93(28%)	20(6%)	0(0%)	334 (100%)
Overall quality of life	94 (28%)	189 (57%)	51(15%)	0(0%)	334 (100%)

3.4. Association of Cervical Cancer Stage and Physical Wellbeing

High proportion of those who experienced poor physical wellbeing 148 (74%) were in stage IV while no respondent in stage IV experienced moderate and good physical wellbeing. High proportion of those who experienced moderate physical wellbeing 41(67%) were in stage I. Physical wellbeing was statistically associated with cervical cancer stage ($\chi^2= 190.3$, $df = 6$, $P < 0.05$).

Table 4. Association of Cervical cancer stage and Physical wellbeing.

Cervical cancer stage	Physical wellbeing		
	Poor n=201	Fair n=72	Moderate n=61
Stage 1 n=52	1 (0.49%)	10(13.8%)	41(67.2%)
Stage 2 n=40	20 (9.9%)	10(13.8%)	10(16.3%)
Stage 3 n=63	32(15.9%)	21(29.1%)	10(16.3%)
Stage4 n=179	148(73.6%)	31(43.0%)	0
	201	72	61

$\chi^2 = 190.2$, $df=6$, $p\text{-value}=0.0001$

Analyses performed by Chi-square tests. Statistically significant at $P \leq 0.05$.

3.5. Association of Cervical Cancer Stage and Treatment Received on Overall Quality of Life

In order to establish association between cervical cancer stage and treatment received on overall quality of life, multiple cumulative logistic regressions were used. The analysis was run using SAS version 9.2. Lower stages of cancer had low chances of poor quality of life as illustrated in the table below controlling for treatment received. Meaning, poor HRQoL was experienced by patients with advanced stages of cervical cancer independent of treatment. The odds of a cervical cancer patient treated with blood transfusion having poor HRQoL was 18 times the odds of the patient

treated with LEEP ($p\text{-value}=0.0008$) having poor HRQoL independent of cancer stage. Whereas it was 4.6 times and 6.5 times the odds of a patient treated with haematemics and radiotherapy respectively ($p\text{-value}=0.0004$ and 0.0089 respectively) having poor HRQoL. The odds of chemotherapy treated patient having poor HRQoL was 12.8 times the odds of a patient treated with LEEP having poor HRQoL controlling for cancer stage. Lastly, the odds of a patient treated with painkillers only having poor HRQoL was 7.8 times the odds of a patient treated with radiotherapy ($p\text{-value}=0.0044$). Treatment received, heavily weighs on the overall quality of life while controlling for cancer stages.

Table 5. Association of cervical cancer stage and treatment received on overall quality of life.

Quality of life (poor, fair, moderate)	Adjusted OR	Lower 95%CL(OR)	Upper 95%CL(OR)	p-value
Cancer stage				
Stage I/Stage II	0.0000	0.0000	0.0000	0.0001*
Stage I/Stage IV	0.1286	0.0296	0.5595	0.0063*
Stage III/Stage IV	0.2140	0.0924	0.4956	0.0003*
Treatment received				
Transfusion/LEEP	17.9890	3.3159	97.5922	0.0008*
Transfusion/Haematemics	4.6151	1.9809	10.7518	0.0004*
Transfusion/Radiotherapy	6.5464	1.6032	26.7313	0.0089*
Chemo/LEEP	12.8432	1.6907	97.5630	0.0136*
Haematemics/Painkillers	0.1824	0.0736	0.4520	0.0002*
Painkillers/Radiotherapy	7.7753	1.8950	31.9017	0.0044*

Note: reference category for multiple cumulative logistic regression equation was poor overall HRQoL. Statistically significant at $P \leq 0.05$.

3.6. Influence of Age, Marital Status, Education and Religion on Overall Quality of Life

The association was performed using multiple cumulative logistic regressions, the analysis was run using SAS version 9.2.

The younger patients had higher odds of poor HRQoL compared to the elderly patients except while comparing patients between 36-46 years olds who had lower odds of poor HRQoL than 47-57 years while controlling for marital status,

level of education and religion. The divorced patients and married patients had a higher HRQoL compared to the widowed patients while controlling for age, religion and level of education. Improvement in HRQoL was seen with increasing levels of education except when comparing secondary levels to no-education and primary education where secondary education experienced poor HRQoL while controlling for age, marital status and religion. The current study found no association between religion and overall HRQoL.

Table 6. Influence of age, marital status, education and religion on overall quality of life.

Quality of life(poor, fair, moderate)	Adjusted OR	Lower 95%CL(OR)	Upper 95%CL(OR)	p-value
Age				
18-35/36-46	2.0908	0.9308	4.6963	0.0740
18-35/47-57	0.7622	0.2750	2.1129	0.6017
18-35/over58	4.4474	1.6590	11.9225	0.0030*
36-46/47-57	0.3646	0.1528	0.8695	0.0229*
36-46/over58	2.1271	0.9654	4.6868	0.0611
47-57/over58	5.8348	2.2818	14.9201	0.0002*
Marital status				
Divorced/Married	0.9535	0.3506	2.5927	0.9256
Divorced/Single	0.4124	0.1056	1.6110	0.2027
Divorced/Widowed	0.3363	0.1266	0.8933	0.0288*
Married/Single	0.4326	0.1292	1.4482	0.1741
Married/Widowed	0.3527	0.1750	0.7110	0.0036*
Single/Widowed	0.8154	0.2486	2.6748	0.7364
Level of education				
Non/Primary	6.3035	2.5576	15.5355	0.0001*
Non/Secondary	0.1771	0.0542	0.5782	0.0041*
Non/Tertiary	51.7888	15.3119	175.1631	0.0001*
Primary/Secondary	0.0281	0.0108	0.0731	0.0001*
Primary/Tertiary	8.2159	3.8478	17.5428	0.0001*
Secondary/Tertiary	292.4994	83.5216	1024.357	0.0001*
Religion				
Muslims/Christians	0.6443	0.1354	3.0650	0.5806

Note: reference category for multiple cumulative logistic regression equation was poor overall HRQoL. Statistically significant at $P \leq 0.05$.

4. Discussions

Most patients in this study experienced poor physical and functional wellbeing; this may have been occasioned by their stage of the disease. Fairly good emotional wellbeing experienced by the patients in this study could be attributed to their religious stance since all of them were religious. This may have cushioned them from anxiety, worry, and losing hope in their fight against the disease. Social/ family wellbeing of the patients was also generally fair due to strong family/community cohesion that is still experienced in the study setting.

The HRQoL results show substantial standard deviations within the domains of wellbeing. This could be explained by the differences in quality of life experienced by patients in different stages of the disease as there were few patients who presented at stage I and were treated by LEEP, such patients do not have much disruptions in their wellbeing. On the other hand, patients who presented at stage III and IV have almost all their wellbeing domains disrupted.

The HRQoL findings in this study, differs with Masika, Wettergren [11], in their study in Tanzania on HRQoL and needs of adult cancer patients which revealed better HRQoL than the current study in all domains of well-being.

Similarly, Tadele [7], evaluated Quality of Life of Adult Cancer Patients Attending Tikur Anbessa Specialized Referral Hospital, Addis Ababa Ethiopia and his findings also revealed better HRQoL in all domains except emotional wellbeing in which the current study scored higher mean. The discrepancy observed may have been attributed to differences in treatment modalities received in these studies. For example, Tadele [7], reported that all patients were put on the mainstream cancer therapies which included surgery,

chemotherapy, radiotherapy and combined therapies. In contrast, most patients in the current study only received blood transfusion and pain killing only.

In addition, the difference in data collection tools employed, where Tadele [7], used EORTC QLQ-C30 which is a generic cancer QoL evaluation tool and the current study used FACT-Cx which combines both general FACT-G and additional concerns for cervical cancer patients may have also contributed since this tool, focused in detailed information regarding cervical cancer. However, the difference in these tools is not so wide and therefore the findings are deemed comparable to a larger extent.

Another difference that may have led to the discrepancy was the difference in cancer stage among the respondents. In the current study, most patients 242(73%) were in stage III and IV while in Tadele [7], only 130(37%) were in stage III and IV. Advanced disease has been associated with poorer quality of life [14, 15]. The two studies also differed in the types of cancers studied, in that the previous study looked at a variety of cancer types with both gender included while, the current study only focused on cervical cancer patients. Due to lack of similar studies, the researcher had to make such comparison. Furthermore, cancers tend to have similar impact on QoL, hence the comparison was justified. However, this points to the need to focus on individual site specific evaluations, in order to generate specific information for policy development.

The significant association between cervical cancer stage and physical wellbeing $P < 0.05$ demonstrated in this study is justified by the finding where majority of patients who experienced poor physical and functional well being were in stage III and IV of the disease. Other studies have also established that stage III and IV of disease mainly affect the

HRQoL of cervical cancer patients [14-16].

This study also reveals significant association between cervical cancer stage and treatment received on overall quality of life. This finding is consistent with Ogoncho, Omuga [17] in their study on determinants of QOL among gynecological cancer patients on follow up at Kenyatta National Hospital in Kenya, which reported that surgical treatment had the highest total quality of life scores. Similarly, this study revealed that patients treated with surgery had very low chances of poor HRQoL as compared to other treatment modalities. This concurs with several other studies that have supported the relationship between cervical cancer stage and treatment received on overall quality of life [14, 16, 18-23]. This shows that assessment of HRQoL should be done based on different stages and treatment modalities to establish how each stage and treatment modality affects cervical cancer patients HRQoL.

Age, marital status, and education influenced overall quality of life of cervical cancer patients in this study. This finding is consistent with Ogoncho, Omuga [17] who also reported that older women with gynecological cancers had higher physical, spiritual, psychological and total HRQoL scores compared to younger ones. The results also concur with Nie and Gao [16], in their study on Chinese cervical cancer survivors which showed a significant association between HRQoL and education level, tumor stage, marital status, and age.

However, Tadele [7], differs with this finding in his study on evaluation of quality of life of adult cancer patients in Ethiopia which showed no correlation between QoL and socio-demographic variables such as age, sex, marital status, and patient's level of education.

Limitations of this study included use of HRQoL assessment tool (FACT-Cx) which was designed in America, and as such exotic to this setting. Fortunately, part of it (FACT G) had been validated in the Kenyan setting by Muiva, (2014). The study was purely descriptive and focused on the patient's subjective perception of their HRQoL, and therefore did not explore clinical implications on HRQoL of patients. The study recommends further analytical research to bring out areas that have not been explored by this study.

5. Conclusion

Most patients experienced low functional and physical well-being suggesting challenges healthcare system was facing regarding management of cancer patients. Proper HRQoL assessments should be performed on cervical cancer patients to ascertain their quality of life. Independent variables such as age, marital status, education, cancer stage and treatment received were associated with overall quality of life of cervical cancer patients.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

JAO designed, carried out the survey study and participated in the drafting of the manuscript and performed statistical analysis.

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