Comparison between Quality of life in Women with Cervical Cancer having either Radiotherapy or both Radiotherapy and Surgery as a line of Treatment

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Abstract:

Background: *Cervical cancer is one of the most widespread gynecological malignancies in women worldwide, with radiotherapy as a treatment strategy leading to exposure to the side effects of radiotherapy; in turn affecting the quality of life.* ***The aim*** *of this study was to assess and compare quality of life in women with cervical Cancer having radiotherapy and women having both radiotherapy and surgery as a line of Treatment. Comparative research design was utilized in this study.***Thestudy setting*** *was conducted at Nuclear Medicine Center in Mansoura University Hospitals.A purposive sampleof 96 patientsdivided into two groups 48 women each, the first group treated with radiotherapy and surgery, the second group treated with radiotherapy only. Each group was selected randomly.***Two tools*** *were used to collect data, the first tool; an interview questionnaire schedule, while the second tool; quality of life scale, adopted from European Organization for Research and Treatment quality of life questionnaire.***The Results*** *of the current study revealed that the quality of life of women receiving radiotherapy was negatively affected; also the quality of life in women receiving radiotherapy and surgery as a treatment modality was worse than women receiving radiotherapy alone.* ***Conclusion:*** *Radiotherapy with cancer cervix affects the QOL. The study recommended that an educational program should be conducted to improve knowledge and quality of life for women with cervical cancer receiving radiotherapy.*

Key Words: *Cancer cervix- Quality of life- Radiotherapy*

I. Introduction

Cervical cancer is one of the most widespread gynecological malignancies worldwide in women. Cervical cancer occurs in about 500 000 women worldwide each year, with prognosis highly dependent on the stage of the disease at diagnosis **(Khalil, et al., 2015).**

Cervical cancer is responsible for more than a quarter of a million deaths each year, mostly in developing countries, making therapeutic advances in all health care settings a top priority **(Sagae, et al., 2015).**In Egypt, about 866 new cervical cancer cases are being diagnosed annually, being the 10th most common female cancer in women aged 15 to 44 years, and ranked as the 13th cause of female cancer **(Ferlay, et al., 2015).**

Treatment strategies and screening modalities have largely evolved in these last years, resulting in an improvement of survival. However, treatment modalities are associated with long-term side effects that impact quality of life in cervical cancer survivors significantly **(Khalil, et al., 2015).** Treatment options for cervical cancer include definitive surgery, fertility sparing surgery, or primary radiation therapy with or without chemotherapy **(Somashekhar and Ashwin, 2015).**

Radiation therapy is a critical treatment modality in the management of patients with gynecologic tumors. However, patients who receive pelvic radiation for gynecologic malignancies may experience toxicity because of the anatomic locations, combination with concurrent chemotherapy and/or surgery **(Viswanathan,et al., 2014).** The main adverse effects affecting patients receiving radiotherapy due to cervical cancer are gastrointestinal toxicity as diarrhea, proctitis, nausea and vomiting. As well as hematological toxicity in the form of anemia, thrombocytopenia and neutropenia, also, urinary toxicity was detected **(Hafiz, et al., 2015).** Also surgical management of cancer can cause short and long-term effects on sexuality, reproductive function, and overall quality of life **(Carter, et al., 2013)**.

Quality of life in cervical cancer patients, depends on multiple variables such as: type of intervention, type of associated treatment, treatment side-effects, type of available support, body image, sexual functioning, financial resources, socioeconomic status, issues regarding taking time off from work, transportation, social support from spouses, family members and friends, as well as support from health care professionals **(Boicea, et al., 2012).**

Changes in the quality of life of women with gynecological cancer are affected by various factors: functional damage secondary to treatments such as pelvic surgery involving the removal of parts of the female genital anatomy and radiation, which damages the vaginal mucosa and epithelium; side effects of chemotherapy, which in part are common to radiotherapy, changes in self-image, low self-esteem, marital tensions, fears and worries **(National Cancer Institute, 2009).**

Several quality of life concerns exist for women treated with radiation therapy for gynecologic malignancies. Significant overlap exists in the QOL issues affecting these patients **(Mirabeau-Beale and Viswanathan, 2014).** The cancer itself, surgery and adjuvant therapy and their side effects together had an effect on quality of life of cervical cancer survivors **(Barnas, et al., 2012).**

Significance of study

The present study results shows that the quality of life of women receiving radiotherapy was negatively affected; also the quality of life in women receiving radiotherapy and surgery as a treatment modality was worse than women receiving radiotherapy alone. From the present study results the research question is accepted.

Aim of the study

This study aims to assess the quality of life for women with cervical cancer undergoing radiotherapy.

Research question

What is the quality of life for women with cervical cancer undergoing radiotherapy?

II. Subjects and Method

Study Design: Descriptive comparative design was utilized in this study.

Study Setting: The present study was carried out at Nuclear Medicine Center in Mansoura University Hospitals, during the period from the end of June 2014 to the end of December 2014.

Subjects of the Study: A purposive sample of 96 patients was divided into two groups. **Group1:** Included all women with cervical cancer who were treated with both surgery and radiotherapy. **Group2:** Included all women with cervical cancer who were treated with radiotherapy only, the women were allocated to the previously mentioned groups according to the following criteria:

Inclusion criteria:
- Women with cervical cancer who received radiotherapy without surgery.
- Women who received radiotherapy with surgery
- Women who agreed to participate in the study.

Exclusion criteria:
- Presence of chronic illness that affects women health related quality of life e.g. diabetes mellitus, hypothyroidism, hyperthyroidism and presence of other malignancy.

Tools of Data Collection*:* Two tools were used to collect data

Tool 1: An interview questionnaire schedule: This tool was developed by the researcher, and reviewed by the supervisors. It consisted of three parts:

Part 1: Patient's General Characteristics: It is composed of (8) items as name, age, residence, marital status, presence of husband, level of education, occupation, persons who taking care, and monthly income.

Part 2: Patient's Medical and Obstetrical History*:*

a - The Patient's Medical History: It consists of 13 questions such as: how & when illness started, type of treatment, surgery type, time of surgery, radiotherapy treatment, radiotherapy regimen, number of radiotherapy session, attendance, side effects, complications and treatment.

b - The Patient's Obstetrical History: It consists of 11 items such as menstrual regularity, amount of menstrual blood, dysmenorrhea, type of labor, number of births and abortions, family planning methods, vaginal discharge, vaginal bleeding, and painful intercourse.

Part 3: Assessment of patients' Knowledge related to Cervical Cancer and Radiotherapy*:* It includes 9 items covering the following: Knowledge of cervical cancer include: definition, incidence, symptoms, causes, and treatment, Knowledge of radiotherapy include: definition, indications, routes of administration, and side effects.

Tool 2: Quality of Life Scale: EORTC QLQ-C30 (version 3): This tool was adapted from **European Organization for Research and Treatment (1986)** to measure quality of life of patients with cervical cancer. It consists of 30 items that assess: global health status: 29 and 30; physical functioning: 1 to 5; role functioning: 6and7; emotional functioning: from 21 to 24; cognitive functioning: from 20 to 25; social functioning: 26 and

27; fatigue: 10, 12 and18; nausea and vomiting: 14 and 15; pain: 9 and 19; dyspnea: 8; insomnia: 11; appetite loss: 13; constipation: 16; diarrhea: 17; financial difficulties: 28.

Scoring system for tool one:

The answer was evaluated using model key answer prepared by the researcher, the score was (0) score for incorrect answer & (1) score for incomplete answer& (2) score for complete answer. There were 54 questions in this scoring system where the answers were divided into *poor* as answering $\leq 60\%$ of the questions right (about 32 question), *good* as answering $\geq 70\%$ of the questions right (about 38 question) and *fair* as answering 60% - 70% of the questions right.

Scoring system of second tool:

All questions are scored on a scale from 0 to 100, with 100 representing the highest level of functioning possible.The scores of the items were summed- up and the total divided by the number of the items, giving a mean score. These scores were expressed in means and standard deviations.

Reliability of second tool:

Scale reliability was analyzed by the partial credit model (PCM) and the multidimensional partial credit model (MPCM), it ranged from 0.47 to 0.89 when the data were analyzed with the PCM. Reliabilities of only the Physical function, Fatigue, and Quality of life subscales were greater than or equal to 0.80, whereas reliabilities for the Cognitive Function and NV subscales were found to be lower than 0.50. When using the MPCM, reliabilities increased and ranged from 0.66 to 0.90, indicating moderate to acceptable reliabilities. In general, reliabilities based on the multidimensional model were higher than those obtainable with the uni-dimensional model.

Validity of the tool:

Content validity was ascertained by 3 experts from maternity nursing and medical oncology staff.

Pilot study:

A pilot study was conducted on 10 %(18 day) of the sample at Nuclear Medicine Center in June 2014 in order to test the content validity, feasibility, clarity, objectivity of the tools. Modification, omission and addition were followed as needed according to the results of pilot study.

Field work:
- Data collection of this study lasted from the end of June 2014 until the end of December 2014.
- Official permissions to carry out the study were obtained from the head of women's health and midwifery nursing department as well as the director of the Nuclear Medicine Center at Mansoura University Hospital.
- First the researcher met each woman who is fit the inclusion criteria.
- The researcher introduced herself to women, a full explanation of the aim and method of the study was done to obtain their acceptance and cooperation as well as their written consent.
- The researcher attend from 9am to 2pm for three days per week, it was sporadic and meet with cervical cancer women at Nuclear Medicine Center at Mansoura University Hospitals.
- The interview took from 30 to 40 minutes with each woman.
- The researcher asked the questions orally and assisted in completing the questionnaire for illiterate or incapable patients.
- Select support person as needed.

III. Statistical Analysis:

Data were analyzed with **SPSS** version 21. The normality of data was first tested with one-sample Kolmogorov-Smirnov test. Qualitative data were described using number and percent. Association between categorical variables was tested using Chi-square test. Continuous variables were presented as mean ± SD (standard deviation). The two groups were compared with Student *t* test.For all above mentioned statistical tests done, the threshold of significance is fixed at 5% level (p-value). The results were considered: Non-significant when the probability of error is more than 5% (p > 0.05), significant when the probability of error is less than 5% (p $\leq$ 0.05) and highly significant when the probability of error is less than 0.1% (p $\leq$ 0.001). The smaller the p-value obtained, the more significant are the results.

IV. Results
Table (1): Distribution of the studied groups according to general characteristics.

Items	Radiotherapy group (48)		Radiotherapy +surgery group (48)		Test of sig. x^2	p-value
	No	%	No	%		
Age						
50-40	10	20.8	8	16.7	$X^2= 0.274$	P=0.601
>50	38	79.2	40	83.3		
Residence						
Rural	29	60.4	27	56.2	$X^2=0.171$	P=0.679
Urban	19	39.6	21	43.8		
Marital status						
Married	27	56.2	27	56.2	$X^2=0.104$	P=0.949
Divorced	21	43.8	13	27.1		
Widow	0	0	8	16.7		
Educational level						
Illiterate	14	29.2	15	31.2	$X^2=0.087$	P=0.993
Can read and write	10	20.8	9	18.8		
High school qualification	18	37.5	18	37.5		
University qualification	6	12.5	6	12.5		
Occupation						
Employee	4	8.3	5	10.4	$X^2=0.219$	P=0.896
Housewife	34	70.8	32	66.7		
Freelancers	10	20.8	11	22.9		
Persons taking care of patients						
Husband	26	54.2	27	56.2	$X^2=0.056$	P=0.972
Brothers	14	29.2	13	27.1		
Siblings	8	16.7	8	16.7		
Income						
Enough	12	25	8	16.7	$X^2= 1.011$	P=0.315
Is not enough	36	75	40	83.3		

Table (1) shows distribution of the studied groups according to general characteristics. It reveals that the majority of the studied patients aged more than (50) years old. More than half of them were living in rural areas. More than half of the patients (56.2%) were married. Also half the patients (50%) were illiterate. Around two thirds of them were housewives. And more than half of both groups (54.2% vs. 56.2% respectively) were under the care of their husbands. Majority of patients (75% vs. 83.3% respectively) didn't have enough financial resources.There were no statistical significant differences between the studied groups (p>0.005).

Table (2): Distribution of the studied groups according to occurrence of side effects during radiotherapy taken.

Side effects	Radiotherapy group (48)		Radiotherapy+surgery group (48)		Test of sig. x^2	p-value
	No	%	No	%		
Fatigue	42	87.5	44	91.7	$X^2=0.447$	P=0.504
Abdominal pain	24	50.0	27	56.2	$X^2=0.376$	P=0.539
Diarrhea	42	87.5	32	66.7	$X^2=5.897$	P=0.015*
Constipation	6	12.5	9	18.8	$X^2=0.711$	P=0.399
Lower limb edema	16	33.3	24	50.0	$X^2=2.743$	P=0.098
Abdominal skin dryness	36	75.0	37	77.1	$X^2=0.057$	P=0.811
Bloody stool	12	25.0	17	35.4	$X^2=1.235$	P=0.266
Frequency micturition	20	41.7	28	58.3	$X^2=2.667$	P=0.102
Dysuria	28	58.3	31	64.6	$X^2=0.396$	P=0.529
Urinary incontinence	6	12.5	7	14.6	$X^2=0.089$	P=0.765
Vaginal discharge	34	70.8	38	79.2	$X^2=0.889$	P=0.346

Dyspareunia	28	58.3	37	77.1	$X^2 = 3.85$	P=0.049*

Table (2) shows the frequency of side effects of radiotherapy as reported by patients in the studied groups. There were no statistically significant difference between both groups regarding side effects of radiotherapy such as fatigue, abdominal pain, constipation, lower limb edema, abdominal skin dryness,bloody stool, frequency of micturition, dysuria, urinary incontinence and vaginal discharge. While there were statistically significant differences between both groups regarding to the occurrence of diarrhea and dyspareunia (p<0.05).

Table (3): Distribution of the studied groups according to occurrence of complications during or less than three months.

Items	Radiotherapy group (48)		Radiotherapy+surgery group (48)		Test of sig. x^2	p-value
	No	%	No	%		
Diarrhea	42	87.5	32	66.7	$X^2=5.897$	P=0.015*
Abdominal pain	34	70.8	32	66.7	$X^2 = 0.194$	P=0.660
Anemia	42	87.5	40	83.3	$X^2 = 0.334$	P=0.563
Cystitis	39	81.2	42	87.5	$X^2 = 0.711$	P=0.399
Urinary bladder ulcer	15	31.2	16	33.3	$X^2 = 0.048$	P=0.827
Urinary bladder fistula	3	6.2	1	2.1	$X^2 = 1.04$	P=0.307
Dysuria	38	79.2	46	95.8	$X^2 = 6.095$	P=0.014*
Frequency of micturition	25	52.1	39	81.2	$X^2 = 9.188$	P=0.002*
Vaginitis	41	85.4	42	87.5	$X^2 = 0.089$	P=0.765
Vaginal dryness	37	77.1	43	89.6	$X^2 = 2.70$	P=0.10
Vaginal tightness and shortness	25	52.1	26	54.2	$X^2 = 0.042$	P=0.838
Dyspareunia	31	64.6	40	83.3	$X^2 = 4.38$	P=0.036*
Skin edema	43	89.6	46	95.8	$X^2 =1.387$	P=0.239
Scratching	32	66.7	34	70.8	$X^2 = 0.194$	P=0.660
Spots in skin (pigmentation)	26	54.2	30	62.5	$X^2 = 0.686$	P=0.408
Skin ulcers	21	43.8	16	33.3	$X^2 =1.099$	P=0.294

Table (3) describes the complications of radiotherapy as reported by patients in the studied groups. It was found that complications of radiotherapy as (abdominal pain, anemia, cystitis, bladder ulcer, urinary bladder fistula, dysuria, vaginitis, vaginal dryness and tightness, skin edema, scratching and skin spots) occurred in both groups with no statistically significant difference. While there were statistically significant differences between both groups regarding to the occurrence of diarrhea, dysuria, frequency of micturition and dyspareunia (p<0.05).

Table (4): Distribution of the studied groups according to occurrence of complications after three months.

Items	Radiotherapy group (48)		Radiotherapy+surgery group (48)		Test of sig. x^2	p-value
	No	%	No	%		
Complications occurring after three months	42	87.5	41	85.4	$X^2=0.089$	P=0.765
Intestinal obstruction	3	6.2	1	2.1	$X^2=1.043$	P=0.307
Intestinal perforation	6	12.5	8	16.7	$X^2=0.334$	P=0.563
Anal stricture	28	58.3	31	64.6	$X^2=0.396$	P=0.529
Anal ulcer	20	41.7	21	43.8	$X^2=0.043$	P=0.837
Recto-vaginal fistula	2	4.2	4	8.3	$X^2=0.711$	P=0.399
Hematuria	34	70.8	32	66.7	$X^2=0.194$	P=0.660
Chronic cystitis	42	87.5	40	83.3	$X^2=0.334$	P=0.563

Vesico-vaginal fistula	4	8.3	3	6.2	X^2=0.154	P=0.695
Dyspareunia	30	62.5	41	85.4	X^2=6.54	P=0.011*
Vaginal stenosis	30	62.5	41	85.4	X^2=6.54	P=0.011*
Pelvic bone fractures	6	12.5	7	14.6	X^2=0.089	P=0.765

Table (4) shows the complications of radiotherapy after three months as reported by patients in the studied groups. It was found that complications of radiotherapy as (intestinal obstruction, perforation, anal stricture, anal ulcer, recto-vaginal fistula, hematuria, chronic cystitis, vesico-vaginal fistula) occurred in both groups without statistically significant difference. While there were statistically significant difference between both groups regarding occurrence of dyspareunia and vaginal stenosis (p=0.0011).

Table (5): Mean and standard deviation of the studied groups according to knowledge score (58).

| Items	Radiotherapy group (48)	Radiotherapy+surgery group (48)	Test of sig. x^2	p-value
Mean ± SD	25.97±9.71	29.04±8.80	t= 1.619	p=0.109
Min-Max	7-47	8-47		
Knowledge classes				
Poor <60%	40(83.3%)	37(77.1%)		
Fair 60-70%	6(12.5%)	7(14.6%)	X^2=0.860	P=0.650
Good >70%	2(4.2%)	4(8.3%)		

Table (5) reveals that the majority (83.3% & 77.21% respectively) in both groups have poor knowledge score regarding to cervical cancer and radiotherapy. While only (4.2% & 8.3% respectively) have good knowledge score. There was no statistically significant difference between both studied groups (p<0.05).

Table (6): Mean and standard deviation of the studied groups according to quality of life.

Quality of life	Radiotherapy group (48)	Radiotherapy+surgery group (48)	t-test	p-value
Global health status	7.75±1.804	6.71±2.13	2.583	0.011*
Functional scales				
Physical	9.46±3.34	10.29±3.83	1.135	0.259
Role functioning	3.54±1.303	3.58±1.36	0.153	0.879
Emotional	10.85±2.71	12.08±2.25	2.417	0.018*
Cognitive	2.77±0.831	2.89±1.056	0.644	0.521
Social	3.02±1.12	3.08±1.089	0.277	0.782
Symptoms scale				
Fatigue	7.50±2.42	8.23±2.29	1.512	0.134
Nausea and vomiting	5.00±1.67	5.46±1.83	1.279	0.204
pain	4.187±1.49	4.52±1.68	1.023	0.309
Dyspnea	2.37±0.86	2.58±0.71	1.289	0.201
Insomnia	2.041±0.898	2.145±0.945	0.554	0.581
Appetite loss	2.541±0.797	2.75±0.837	1.248	0.215
Constipation	1.646±0.699	1.687±0.829	0.266	0.791
Total Quality of life	66.62±14.53	70.12±13.94	1.204	0.232

Table (6) reveals that there were statistically significant difference between the studied groups regarding to the global health status and emotional functional scale (p=0.011 & 0.018 respectively). While there was no statistically significant difference regarding to the physical, role, cognitive and social scales. In the same table, there was no statistically significant difference in symptoms scale between both groups (p>0.05).

Figure (1): Distribution of the studied groups according to quality of life.
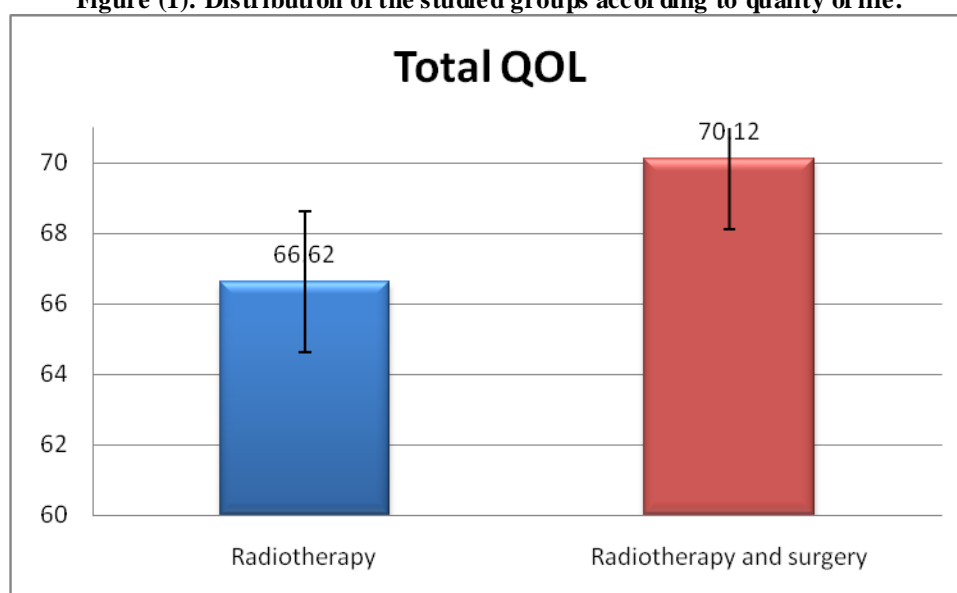
This figure shows the total quality of life score of both studied groups. There were no statistically significant differences between both groups (p=0.232).

Table (7): Correlation between general characteristics of the study groups and QOL score.

Items	Radiotherapy group (48)	Test of sig. p-value	Radiotherapy+surgery group (48)	Test of sig. p-value
Age				
50-40	71.12±18.87	t=0.958	74.12±17.07	t=0.887
50>	65.72±13.62	p=0.343	69.32±13.34	p=0.380
Residence				
Rural	66.34±13.22	t=0.163	70.85±13.30	t=0.406
Urban	67.05±16.71	p=0.871	69.19±15.01	p=0.687
Marital status				
Married	64.07±13.43	F= 1.489	66.29±12.21	F=4.365
Divorced	67.64±15.33	p=0.236	70.92±12.95	p=0.019*
Widow	74.42±16.13		81.75±15.87	
Educational level				
Illiterate	65.35±16.40		67.20±16.11	
Can read and write	60.50±6.45		68.77±9.18	
High school qualification	72.11±14.50	F=1.651 p=0.191	73.77±12.38	F=0.672 p=0.574
University qualification	63.33±17.18		68.50±19.08	
Occupation				
Employee	52.25±0.95	F=2.248	57.60±3.78	F=2.684
Housewife	67.97±14.90	p=0.117	72.46±14.79	p=0.079
Freelancers	67.80±13.70		69±11.52	
Persons taking care of patients				
Husband	62.96±12.37	F= 3.045	66.29±12.21	F= 4.365
Brothers	67.64±15.33	p=0.058	70.92±12.95	p=0.019*
Siblings	76.75±16.31		81.75±15.87	
Income				
Enough	63.00±14.54	t=0.769	68.37±16.13	t=0.385
Is not enough	67.35±14.60	p=0.446	70.47±13.67	p=0.702

Table (7) shows correlation between the studied groups regarding to general characteristics and QOL score. It reveals that there were statistically significant differences between the studied groups as regard marital status and persons taking care of the patients, where the QOL was better with the radiotherapy plus surgery

group than with radiotherapy only group. While there were no statistically significant differences between both groups as regard age, residence, educational level, income and occupation.

Table (8): Correlation between knowledge score of the study groups and QOL.

Items	knowledge score			
	Radiotherapy group (48)		Radiotherapy+surgery group (48)	
	r	p	r	p
QOL	0.145	0.327	0.071	0.631

Table (8) shows correlation between the studied groups regarding to knowledge and QOL. It reveals that there is positive linear correlation between the knowledge of the subjects and QOL as regard the method of treatment. Where this table shows that the knowledge was more with the radiotherapy plus surgery group than with the radiotherapy only group but, there was no statistically significant difference between both groups.

V. Discussion

Cervical cancer is one of the most widespread gynecological malignancies in women worldwide, treatment strategies and screening modalities have largely evolved these last year's resulting in an improvement of survival. However, treatment modalities are associated with long-term side effects that significantly impact quality of life in cervical cancer survivors **(Khalil, et al., 2015).**

The present study results shows that the quality of life of women receiving radiotherapy was negatively affected; also the quality of life in women receiving radiotherapy and surgery as a treatment modality was worse than women receiving radiotherapy alone. From the present study results the research question is accepted.

The present study results showed that, the majority of the studied patients were aged more than (50) years old, this is in agreement with**American cancer society (2014)**, which reported thatcervical cancer tends to occur in midlife (45-65 years) and most cases are found in women younger than 50 years and rarely develops in women before the age of 20.

More than half of the patients were from rural area; the possible explanation for the large amount is present from rural area may be due to lack of health care centers which provide health education role about preventive measures and periodically checkup for early detection for disease and good prognosis. These present study results were supported by **Benard, et al., (2007),**who study reported that the incidence rates were lower among residents of urban areas than in rural areas.

More than half of the patients were illiterate, while minority of them had completed university degree. These findings might be due to the majority of patients were from rural area with less attention to education and decrease the level of health awareness, These findings were in agreement with**Nunez-Troconis, et al.,(2008),**who study reported that more than half of studied subjects had a low educational level and did not finish primary school.

Less than half of women were married. These findings might be due to the same age groups of the studied sample. The present study findings were in accordance with **Rustagi, et al., (2014),** who study found that the high rates of the disease were in formerly married women.

Around two third of patients were house wives; this may be due to more than half of them were illiterate with low socioeconomic standard and also due to the burden of the cancer and its treatment on the family. These present study findings were in agreement with **Raychaudhuri and Mandal,(2012),** who study found that about two third of studied subjects were housewives. But our results were in disagreement with **Nunez-Troconis, et al., (2008),** who reported that the majority of women were workers.

The results of the present study revealed that, the majority of women had insufficient family income per month. This may be related to the majority of women were housewives. In addition cancer patient needs more money for buying medications and treatment costs. These present study findings were in the same line with results of the study done by **Sichanh, et al., (2014),**who study reported that the majority of the subjects had lower economic status.

There were statistically significant differences between both groups as regard dyspareunia and vaginal stenosis, these side effects were more with the radiotherapy plus surgery group than that in the radiotherapy only group, this may be due to damage of sacral nerves causing changes to the sensory perception in the tissues of the genital area, thus altering sexual sensation and responsiveness, in addition to the effect of the surgery in the form of disfigurement or loss of the genital organs.These present study results were in agreement with **Jensen, et al.,(2004)**who study found that radical hysterectomy had a persistent and negative impact on patients' sexual interest and vaginal lubrication. Also these present study findingswere in agreement with**Lalos, et al.,(**

2009),who study found that patients who had surgery plus adjuvant radiotherapy complained of genitourinary symptoms such as vaginal dryness with painful intercourse and tightening and/or shortening of the vagina.

Moreover the present study results were in the same line with **Hsu, et al., (2009)**who study reported that dyspareunia and vaginal dryness were significant with subjects received radiotherapy compared with those had surgery only after age adjusted standardization, otherwise the surgery group had more sexual dysfunction than that with radiotherapy group, taking both into consideration with the summation of complications of both radiotherapy and surgery, this may explain why dyspareunia and vaginal stenosis were statistically significant in the present study results.

In addition, the our results were in the same line with **Greimel, et al.,(2009)**who study found that the feeling of tight vagina was significantly higher with the irradiated patients with lower sexual activity than in patients who had surgery plus adjuvant radiotherapy. Also our results were confirmedby **Kumbhaj, et al.(, 2014),**who studyfound that survivors with cervical cancer had worse sexual functioning that those treated with surgery alone, which in turn had worse sexual functioning and quality of life than those with no history of cervical cancer.

Lastly, our results were in accordance with **Bignell, et al.,(2015***)*, who study found that cervical cancer tend to affect younger women than any other gynecological cancer and it is commonly diagnosed in the period where the woman is sexually active, this leads to a major complaint as regard the sexual function which is affected with cancer treatment**.**

The present study revealed that, there were statistically significant differences between both groups as regard gastrointestinal symptoms in the form of diarrhea, which was more in the radiotherapy only group than in the radiotherapy plus surgery group, this may be due to the bile salt and lactose mal-absorption, bacterial imbalance and altered intestinal peristalsis. These present study results were in the same line with **Hsu, et al., (2009)** who found that diarrhea is a common side effect with radiotherapy.

Moreover the present study results were in accordance with **Ditto, et al.,(2009)** who study found that adjuvant radiotherapy had additional risk for pelvic visceral dysfunction. Also the present study results were in the same line with **Bjelic-Radisic, et al ., (2012)** who study found that diarrhea was one of the fewest problems reported by patients undergoing surgery only and is significant with patients receiving radiotherapy.

Concerning tocomplications of radiotherapy,these findings of present study revealed that, there were statistically significant differences between both groups as regard urinary symptoms in the form of dysuria and frequency of micturition which were more with radiotherapy plus surgery group than with radiotherapy alone group, this may be due to the damage added to the nerves of the bladder and urethra during radical hysterectomy, it may also be due to the hormonal changes after surgery with the removal of the ovaries. These present study findings were in agreement with**Vistad, et al., (2006),**who study reported that the urinary symptoms were frequent following having both surgery and radiotherapy. Also the present study results were in the same line with **Oda, et al., (2011***),*who study found that the urodynamic studies of patients who had radical hysterectomy and adjuvant radiotherapy, showed frequency and urgency that may be due to decreased bladder compliance.

Moreover, another study that agrees with the present study results was done in Spain by **Ros and Espuna, (2013),** who study found that there was significant association between radical hysterectomy and bladder voiding dysfunction especially in women who also receive radiation therapy. While the present study results were in disagreement with **Pieterse, et al., (2006),** who study found that adjuvant radiotherapy did not increase the risk of bladder dysfunction.

Regardingthe knowledge score and quality of life of the studied groups, the findings of the present study revealed that the majority of the studied subjects had poor knowledge score about cancer and radiotherapy, this might be due to more than half of subjects were from rural areas with less attention to acquisition of knowledge, and half of the women's were illiterate, also due to health team overload and might also be due to the neglect to provide the patients with health education and informationneeded for the disease. These present study results were in agreement with **John, (2011),** who study showed that about most of sample had poor knowledge regarding to cancer cervix and radiotherapy. Also these present study findings were in congruence of **Aswathy, et al., (2012),**who study found that the majority of the study subjects had poor knowledge on the various aspects like symptoms, risk factors, and screening test.

The present study revealed that, quality of life of both groups was affected.There were statistically significant differences between both groups as regard global health statuswhich was better with the radiotherapy alone group than that with the radiotherapy plus surgery group, this may be due to the burden added to the subjects of the study due to the affection of all Quality of life aspects (in spite it had no statistically significant difference between both groups, but the affection of the Quality of life was more with the radiotherapy plus surgery group) that caused the health status globally of radiotherapy alone group to be better. The present study results were in agreement with **Hawighorst-knapstein, et al., (2004***),* who study found that cervical cancer subjects receiving radiotherapy in addition to surgery had more global health Quality of life problems. Also

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these present study results were in accordance with **Bignell, et al., (2015)**, who found that treatment of cervical cancer negatively impacts patients' quality of life.

While the present study results were in contrast with **Santos, et al., (2012)** who study found that there was no difference in quality of life of patients as regard the immediate results after radiotherapy and recommended further follow up to detect the affection in quality of life after a longer period of time, taking into consideration that it used another score system which is the Functional Assessment of Cancer Therapy-Cervix.

Regarding to the emotional functional scale the present study results found that there were statistically significant differences between both groups. The emotional functional scale was more affected with the radiotherapy plus surgery group than the radiotherapy alone group; this may be due to the fear of death and stress the subjects were prone to due to both the surgery and the radiotherapy. The present study results were in agreement with **Bjelic-Radisic, et al., (2012)**who found that patients without surgery reported the least impairment in emotional scale.

Regarding to physical, role, cognitive and social scales the results of the present study found that in spite of having no statistically significant difference between both groups, there were negative impact for the physical, cognitive, social and role functioning scales, these quality of life scales were more affected in the radiotherapy plus surgery group than with the scales in the radiotherapy alone group. The present study results were in agreement with **Hawighorst-knapstein, et al., (2004),** who found that the physical and sexual scales were affected after surgery as the patients indicated their sexual problems to be the greatest restriction in terms of quality of life, especially in women with adjuvant radiotherapy.

In addition, the results of the present study were in agreement with**Frumovitz, et al.,(2005),** who study found that there was worsening in overall quality of life in the subjects received radiotherapy. Also the results of the present study were in agreement with **Bjelic-Radisic, et al., (2012)**who found that patients underwent surgery plus another treatment reported negative impact for the physical, cognitive, social and sexual functional scales.

Furthermore, the results of the present study were in the same line with **Greimel, et al.,(2009)**who found that cervical cancer survivors who had adjuvant radiotherapy were at risk for impaired quality of life. A recent study by **Khalil, et al., (2015)** disagrees with the present study results as it found that cervical cancer survivors reported good global quality of life which was particularly evident with the social, physical and role functioning domains. Also in contrast to the present study results, **Pasek, et al., (2013)** who study found that patients with cervical cancer were satisfied with their global quality of life.

Regardingto the correlation between general characteristics and quality of life, the findings of the present study revealed that there were statistically significant differences between the studied groups as regard marital status and persons taking care of the patients, where the quality of life in subjects who were married and who had persons accompanying them had better quality of life, this may be due to the support of the husband and accompanying personnel give to the subjects making them able to cope with the side effects and complications of cancer treatment which results in better quality of life. These present study findings were in agreement with **Wenzel, et al., (2005),**who study stated that subjects with poorer social support reported significant greater distress, less confident managing illness, worse health, lower spiritual wellbeing and used maladaptive coping methods with the disease as denial and substance abuse.

Moreover, the present study results were in the same line with **Fernandes& Kimura, (2010)**, who study found that marital status was a predictive factor in the quality of life, indicating that the presence of a partner creates greater comfort and emotional support for patients diagnosed with cervical cancer, as creating a healthy environment where they can feel integrated into the family context is extremely important.

As regardto the correlation between knowledge score and quality of life, the findings of the present study revealed that there were statistically significant differences and a positive linear correlation between the studied groups as regard knowledge score and quality of life, where the radiotherapy plus surgery group had better quality of life in correlation with knowledge score than that with the radiotherapy only group, this may be due to the longevity of the treatment time due to being subjected to surgery (with its preoperative counseling) and radiotherapy (with its pre-radiation counseling), in contrast to the subjects receiving radiotherapy only as they don't have the advantage of receiving enough counseling. These findings of the present study were in the same line with **(Wenzel, et al., 2005**) who study stated that well informed cancer patients often do better in managing disease sequelae leading to better understanding and better quality of life in cervical cancer.

VI. Conclusion
The results of the present study concluded the following:

Overall the findings of the present study highlighted some important features regarding the assessment of quality of life for women with cervical cancer undergoing radiotherapy, where that radiotherapy with cancer cervix affects the QOL, in which the highest affections were with the global health status and the emotional scale while the lowest affections were with the physical, role, social function.

Recommendations

According to the findings of the present study, the following suggestions are recommended:

- A brief quality of life questionnaire as the **QLQ-C30** should be applied as a routine work in the out-patient radiotherapy clinic in order to detect early evolving problems affecting the quality of life for women with cervical cancer.

- Improving women's quality of life should be the main objective for the medical stuff during their care of women with cervical cancer receiving radiotherapy.

- Identify and communicate patients with poor QOL scores prior to radiotherapy with or without surgery so that discussion can take place about discharge planning, social support, and follow-up strategies.

- Develop and coordinate a multidisciplinary team approach in the outpatient radiotherapy clinics that includes qualified nurse, obstetrics surgeon, social worker and psychological physician to assist patients with cervical cancer receiving radiotherapy in maintaining near normal life style at highest possible level of quality of life.

- Study recommended that an educational program should be conducted to improve knowledge and quality of life for women with cervical cancer receiving radiotherapy.

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