

Effect of Chemotherapy and Radiation Treatment on Body System among Women Suffering from Cervical Cancer

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Abstract

Background: Cervical cancer is a significant global health issue, particularly among women, with a considerable impact on morbidity and mortality rates. **Aim:** Was to study effect of chemotherapy and radiation treatment on body system among women suffering from cervical cancer **Design:** Descriptive study design. **Setting:** The current study was conducted at Menoufia oncology hospital. **Sampling:** A purposive sample included 50 women. **Tools of data collection:** Three tools were used. Tool (I) A structured interviewing questionnaire to assess women's general data, menstrual, obstetrics and family history, and clinical data about cervical cancer. Tool (II) Assessment of women's knowledge about cervical cancer and its treatment. Tool (III) Assessment sheet for women complain from side effect of chemotherapy and radiation treatment. **Results:** About two-thirds of the studied women had adequate knowledge regarding cervical cancer chemotherapy and radiation while one-third of the studied women had inadequate knowledge regarding cervical cancer. The most symptoms that chemotherapy and radiation treatment affect on body system frequent infection, anorexia, tinnitus, difficult breath, irregular menstruation inflammation in the mouth , bone pain and diminished sexual arousal. **Conclusion:** Chemotherapy and radiation treatment had adverse effect on all body systems among women suffering from cervical cancer. **Recommendations:** Implementing health education for the women suffering from cervical cancer receiving chemotherapy and radiation treatment about the side effect s that may caused by treatment and the ways to alleviate it.

Keywords: Body systems, Cervical cancer, Chemotherapy, Radiation treatment.

Introduction

One of the most frequent cancer types in women worldwide is cervical cancer. Cervical cancer is the fourth most prevalent cancer and the fourth leading cause of cancer death in women worldwide, with an estimated 530,000 new cases and 270,000 deaths every year. Cervical cancer is commonly treated by primary surgery, radiotherapy, and/or chemotherapy (World Health Organization WHO, 2022).

Cancer of the uterine cervix is the third most common gynecologic cancer diagnosis and cause of death among gynecologic

cancers. Cervical cancer has lower incidence and mortality rates than uterine corpus and ovarian cancer, as well as many other cancer sites. However, in countries that do not have access to cervical cancer screening and prevention programs, cervical cancer remains a significant cause of cancer morbidity and mortality (Guimarães et al., 2022).

Many symptoms at early-stage cervical cancer generally produces no signs or symptoms but, signs and symptoms of more advanced cervical cancer includes vaginal bleeding after intercourse, between periods or after menopause, watery, bloody vaginal

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discharge that may be heavy and have a foul odor, pelvic pain or pain during intercourse (Tewari et al., 2022).

There are many types of cervical cancer, and each type helps to determine prognosis and treatment. The main types of cervical cancer are squamous cell carcinoma and this type of cervical cancer begins in the thin, flat cells (squamous cells) lining the outer part of the cervix, which projects into the vagina. Most cervical cancers are squamous cell carcinomas. The second type is adenocarcinoma that begins in the column-shaped glandular cells that line the cervical canal. Sometimes, both types of cells are involved in cervical cancer. Very rarely, cancer occurs in other cells in the cervix (Serrano et al., 2022).

Treatment for cervical cancer depends on several factors, such as the stage of the cancer, other health problems that the women may have and preferences. Surgery, radiation, chemotherapy or a combination of the three may be used. Early-stage cervical cancer is typically treated with surgery and depends on the size of cancer, its stage and whether the woman like to get pregnancy in the future (D'Oria et al., 2022).

Radiation therapy uses high-powered energy beams, such as X-rays or protons, to kill cancer cells. Radiation therapy is often combined with chemotherapy as the primary treatment for locally advanced cervical cancers. It can also be used after surgery if there's an increased risk that the cancer will come back. Chemotherapy is a drug treatment that uses chemicals to kill cancer cells. It can be given through a vein or taken in pill form. Sometimes both methods are used. For locally advanced cervical cancer, low doses of chemotherapy are often combined with radiation therapy (D'Oria et al., 2022).

Treatment of cervical cancer either with chemotherapy or radiation has many

effects on different body systems, radiation side effects vary depending on the dose of radiation and the length of the treatment. Many will be short-term side effects that occur during treatment or within a few weeks of finishing. Side effects can take several weeks to get better. Such as fatigue, bladder and bowel changes, skin redness, soreness and swelling, hair loss, vaginal discharge, menopause, and pelvic fractures (De Felice et al., 2022).

Chemotherapeutic agents have toxic effects on cells which can cause serious health problems such as nausea, vomiting, anemia, skin reaction including alopecia, allergic hypersensitivity reactions, skin necrosis, mucositis, and sloughing at the site of intravenous extravasation (Hama et al., 2019).

Chemotherapy also affects some normal cells, which can lead to certain side effects. Side effects depend on the type and dose of the drugs and the length of time of treatment. Many side effects are short-term and disappear after treatment is terminated, but some can last a long time. Short-term side effects can include nausea and vomiting, loss of appetite, hair loss, and fatigue (D'Oria et al., 2022).

Because chemotherapy can damage the blood-producing cells of the bone marrow, the blood cell counts might become low and result in an increased chance of infection from a shortage of white blood cells (called neutropenia), bleeding or bruising after minor cuts or injuries because of a shortage of blood platelets, and shortness of breath due to low red blood cell (Hassan et al., 2022).

The role of nurse is to assess the past health history, health practices, and both the women's and family's knowledge regarding the disease and treatment and should be aware of the expected outcomes and possible complications of treatment. Assessment of physical, emotional, psychological, social, or

spiritual suffering is indicated at the time of diagnosis of cervical cancer of any stage, also, the nurse should assess pain, vaginal discharge, vaginal bleeding, anxiety, depression, sexual dysfunction, or social distress at the time of diagnosis (**Krakauer et al., 2021**).

Significance of study:

Cervical cancer is the fourth most prevalent cancer among women on a global scale, comprising approximately 604,000 new cases and leading to 342,000 deaths worldwide. In poor and middle-income nations around 90% of deaths from cervical cancer occurred. According to the latest world health organization data, cervical cancer deaths in Egypt reached 625 or 0.12% of total deaths (**WHO, 2022**).

Egypt has a population of 36.7 million women ages 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 1320 women are diagnosed with cervical cancer and 744 die from the disease. Cervical cancer ranks as the 13th most frequent cancer among women in Egypt and the 9th most frequent cancer among women between 15 and 44 years of age (**World Health Organization Information Centre, 2023**).

The **American Cancer Society, (2020)** has shown that there are many side effects origins with cervical cancer treatments and include vomiting (90%), fatigue (94%), Hair loss (84%), vaginal bleeding (50.6%) lower back pain (28.4%), sexual pain (25.8%) polymenorrhoea (42.4%); persistent, uncomfortable vaginal smell (30.4%), and postmenopausal bleeding (55.2%).

All types of cervical cancer treatment usually affect the body system with many short term and long term problems and symptoms, which negatively affects the women's physical and psychological wellbeing, and women may require more openness and confidence to adjust to these changes. Which directly affects

personal and social life (**Hassan et al., 2022**). So, it's very important to study the effect of chemotherapy and radiation treatment on body system among women suffering from cervical cancer.

Aim of the study:

Was to study effect of chemotherapy and radiation treatment on body system among women suffering from cervical cancer.

Research questions:

1. What is the women's knowledge about cervical cancer?
2. What is the women's knowledge about effects of chemotherapy and radiation treatment on body systems?
3. To what extent chemotherapy and radiation treatment affect on body systems?

Subjects and Method:

Study design:

A descriptive study design was utilized to fulfill the aim of the current study.

Study setting:

The study was conducted at Menoufia oncology hospital in Menoufia governorate. This hospital is composed of 5 floors. The ground floor consists of outpatient clinics which are divided into 5 units (A,B, C, H (hematological cancer clinic) and radiation clinic), these units provide health care services 6 days a week. The 2nd floor contains head nurse office and patient registration offices. The 3rd floor contains male and female inpatient wards which host patient who receive cancer treatment. The 4th floor is under development and the 5th floor contains the head office department and secretary office.

Sampling:

Sample type: A purposive sample was included in the current study.

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Sample size: All women with cervical cancer who received chemotherapy and radiation therapy and attended at the previously mentioned study setting for a period of 6 months which were 50 women and selected according to the following inclusion criteria:

- Women age \geq 18 years.
- Women who receive chemotherapy and radiation treatment.
- Free from any medical and obstetrics diseases.
- Can read and write.
- Agree to participate in the study.

Tools of data collection:

Three tools were utilized for collecting data:

Tool (I): A structured interviewing questionnaire: was constructed by the researchers after reviewing related literature and written in an Arabic language and included four parts:-

Part (1): general characteristics of studied women included 7 questions as (age, level of education, marital status, occupation, residence, type of Family and family Income).

Part (2): Menstrual, Obstetrical and gynecological history involved 8 items as (gravity, parity, type of labor, complication after previous delivery, method of family planning, previous gynecological operations, menstrual problems and menopause occurrence).

Part (3): Family history included 4 items as (Family history of any chronic diseases, family history of cervical cancer, degree of relationship and type of tumor).

Part (4): Clinical information about the disease included 5 items as (duration since diagnosis of cervical cancer, methods of diagnosis, initial symptoms, type of treatment and duration of treatment).

Tool (II) Assessment of women's knowledge about cervical cancer:

This Tool was designed by the researchers after reviewing related national and international literature (Mayer et al.,2020). It was written in an Arabic language and included three parts:-

Part (1) general knowledge about cervical cancer included 10 items related to (source of knowledge about of cervical cancer, definition of cervical cancer, risk factors , most common viruses that cause cervical cancer, types of cervical cancer, diagnosis, complication, treatment and type of surgical treatment).

Part (2) knowledge about chemotherapy included 12 items (definition of chemotherapy, effect of chemotherapy on general health, effect of chemotherapy on body immunity, effect of chemotherapy on central nervous system, effect of chemotherapy on digestive system, effect of chemotherapy on respiratory system, effect of chemotherapy on heart and blood vessels, effect of chemotherapy on kidney, effect of chemotherapy on reproductive system and reproduction, effect of chemotherapy on different senses of the body, effect of chemotherapy on muscles and bones and effect of chemotherapy on the skin).

Part (3) knowledge about Radiotherapy included 10 Items related to (definitions of radiotherapy, method of using radiotherapy, effect of radiotherapy on central nervous system, effect of radiotherapy on digestive system, effect of radiotherapy on kidney, effect of radiotherapy on reproductive system, effect of radiotherapy on different senses on the Body, effect of radiotherapy on muscles and bones, effect of radiotherapy on the skin).

Knowledge scoring system:

The answer of each item was scored as following: Correct answer was given a score

(2), and incorrect answer or I don't know was given a score (1). Women's total knowledge score was converted into total percentage and graded as the following:

- Adequate knowledge ≥ 60 % of total knowledge score.

-Inadequate knowledge < 60 % of total knowledge score.

Tools (III): Assessment sheet for woman's complain from side effect of chemotherapy and radiation treatment:

This Tool was adapted from **Shonnon et al (2018)** to assess health problems affecting women suffering from cervical cancer and received chemotherapy and radiation treatments and whether these health problems are developed before starting the treatment, during the treatment period or after the treatment. It included two parts:

Part (I): Effect of chemotherapy on women suffering from cervical cancer:

- Effect of chemotherapy on general health, included 4 items (fatigue, body aches, sleep problems, difficulty in performing activity of daily living).

- Effect of chemotherapy on immune system included 3 items (weak immunity, recurrent fever and recurrent infection).

- Effect of chemotherapy on central nervous system included 6 items (recurrent headache, difficult concentration, memory disorders, psychological problems, numbness or tingling and shiver in the body)

- Effect of chemotherapy on digestive system involved 7 items (Nausea and vomiting, anorexia, losing weight, heart burn, recurrent diarrhea, recurrent constipation and difficult swallowing and chewing)

- Effect of chemotherapy on respiratory system included 4 items (recurrent respiratory

infection, difficult breath, chest pain and cough).

- Effect of chemotherapy on cardiovascular system composed of 8 items (palpitation, unable to do daily activity, high blood pressure, low blood pressure, swelling of the face and extremities, dizziness, shortage of red blood cells and low platelet count).

- Effect of chemotherapy on renal system included 7 items (bladder infection, urinary incontinence, urinary tract obstruction, urine retention, difficult urination, frequent urge to urinate, blood in urine and urgency).

- Effect of chemotherapy on reproductive system involved 5 items (pain during menstrual period, irregular menstruation, bleeding between period, menopause and infertility).

- Effect of chemotherapy on different senses of the body involved 5 items (hearing disorders, hearing loss, weakness of vision, blurred vision and unable to taste food).

- Effect of chemotherapy on muscle and bone composed of 7 items (bone pain, neck stiffness, muscle pain, muscle weakness, osteoporosis, joint pain and recurrent fractures).

- Effect of chemotherapy on the skin included 5 items (itching in skin, change of color of the skin , sensitive to the light and sun, weak nails and discoloration of nails).

Part (II): Effect of radiation therapy on women suffering from cervical cancer:

- Effect of radiotherapy on nervous system, it included 5 items (headache, numbness or tingling, feeling of imbalance, difficulty speaking and inability to control defecation).

- Effect of radiotherapy on digestive system involved 10 items (nausea and vomiting, loss of appetite , loss of weight, infection in

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rectum, intestinal infection, blockage in the small intestine, ascites, difficulty chewing and swallowing, frequent constipation and frequent diarrhea).

- Effect of radiotherapy on respiratory system included 4 items (recurrent respiratory infections, difficulty breathing, chest pain and cough).

- Effect of radiotherapy on heart and blood vessel composed of 3 items (low blood pressure, high blood pressure and clots and other heart problems).

- Effect of radiotherapy on renal system included 7 items (burning sensation while urinating, recurrent urinary tract infection, kidney problem, bladder infections, urinary retention, difficulty urination and frequent urge to urinate).

- Effect of radiotherapy on reproductive system involved 6 items (pain during sexual intercourse, diminished sexual arousal, loss of libido, dissatisfaction with the sexual relationship, narrowing of the vaginal opening and recurrent infection of the reproductive system).

- Effect of radiotherapy on different senses of the body included 5 items (hearing disorders, vision problems, loss of the ability to smell, poor vision and inability to taste foods).

- Effect of radiotherapy on muscles and bones involved 5 items (bone pain, muscle pain, muscle weakness, osteoporosis and recurrent fractures).

- Effect of radiotherapy on skin included 5 items (weak nails, dry skin, inflammation of the mouse, recurrent infection and cellulitis).

Tools validity and reliability:

Tools of data collection were reviewed by four panel expertise (two professors from

Obstetrics and Gynecological Nursing department, one professor from Medical and Surgical Nursing department, and one professor from Oncology and Nuclear Medicine department at Faculty of Medicine, Benha University) to test content validity. Reliability was done by Cronbach's alpha coefficient test which revealed that the internal consistency of knowledge questionnaire was (0.87) and Assessment sheet of side effects of chemotherapy and radiotherapy was (0.79).

Ethical considerations: -

Ethical aspects were considered before starting the study as the following:

- The study approval was obtained from Scientific Research Ethical Committee at faculty of nursing, Benha university before starting the study.
- An official permission from the selected study settings was obtained for the fulfillment of the study.
- Each woman was informed about the study aim before starting the data collection to gain confidence and trust.
- Each woman was informed about the purpose and benefits of the study. Oral consent was obtained from women to participate in the study.
- No harm or any physical, social or psychological risk for participants. Data included in the tools did not touch tradition, culture, religious and ethical issues.
- Confidentiality was ensured throughout the study process, and the women were assured that all data was used only for research purpose. Each woman was informed that participation in the study was voluntary and had freedom to withdraw from the study at any time.

Administrative design:

An official approval to conduct this study was obtained from Dean of Faculty of Nursing,

Benha University to Director of Menoufia oncology hospital, before starting the data collection. Then, the researchers interviewed each study participant and obtained an informed oral consent before collecting data.

Pilot study:

The pilot study was conducted on 10 % of the total sample (5 women) to test the clarity and applicability of the tools used for data collection, estimate the time needed to fill in the questionnaire, also to find out the possible obstacles and problem that face the researchers and interfere with data collection. According to the result of the pilot study, no modifications were done. So, women included in the pilot study were involved in the final sample size.

Field work:

-The study started by reviewing current national and international related literatures to the study topic. Also, theoretical knowledge of various aspects of the study using books, articles, periodicals, magazines and internet was obtained to develop tools of data collection. The study was carried out from the beginning of September, 2022 till the end of February ,2023 covering 6 months.

-The study was conducted to women suffering from cervical cancer at Menoufia oncology hospital to evaluate effects of chemotherapy and radiation treatment immediately after obtaining approval for conduction. The researchers visited the previous mentioned setting 3days per weeks (Saturday, Monday, and Wednesday) from 9 am to 1 pm until a period of 6 months was completed.

-The researchers met the women in the appropriate separate place after receiving chemotherapy and radiation treatment during the interview to maintain privacy and confidentiality of the study, At the beginning of interview, the researchers introduced herself, greeted each woman and explained the

aim of the study for obtaining a written consent to participate in the study. Women were assured that information collected would be treated confidentially and it would be used only for purpose of research.

- Then, the researchers used tool (I) A structured interviewing questionnaire to obtain general characteristics of studied women, menstrual and obstetrics and gynecological history, family history and clinical data about the disease, this took 10-15 minutes. After that, the researchers used **(tool II)** women' knowledge about cervical cancer to assess women's knowledge about cervical cancer, chemotherapy and radiation treatment, this took 10-15 minutes. At last, researchers used **tool (III)** assessment sheet for women complains from side effect of chemotherapy and radiation treatment to assess health problems affecting women suffering from cervical cancer who received chemotherapy and radiation treatment and this took 15-20 minutes. The average time needed for the interview of every woman was 35- 50 minutes and the average number of woman that was interviewed was 1 woman per day.

Statistical analysis:

The data were coded, computed and statistically analyzed by using Statistical Package of Social Sciences (SPSS) (version 25). Data were presented as frequency and percentages (qualitative variables) and mean and standard deviation (quantitative variables). Tests of significance were chi-square χ^2 and fisher exact test. Correlation coefficient (r) was calculated between knowledge and effect of chemotherapy and radiation treatment .A statistical significant difference was considered at p-value ($p \leq 0.05$) , and a highly statistically significant difference was considered at p-value ($p \leq 0.001$).

Limitations of the study: -One of the problems that the researchers faced during the

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study was the overcrowded and noise in the waiting place of the which required more time and effort to conduct the study .

Results:

Table (1) shows that 42 % of studied women aged $45 < 55$ with Mean age 47.82 ± 7.25 years. Regarding educational level, 36% of the studied women had university education and 86% of them were married. Regarding occupation 72% of studied women were housewives. Also, 56% of the studied women were from rural areas, and about 60% of them lived in extended families. Regarding monthly income 60% of the studied women had not enough monthly income.

Figure (1) illustrates that 64.0% of studied sample had adequate total knowledge regarding cervical cancer, while, 36.0% of them had inadequate total knowledge regarding cervical cancer.

Table (2) shows that 68% of studied sample had adequate total knowledge regarding effects of chemotherapy on body system and 62% of studied women had adequate total knowledge regarding about effects of radiotherapy on body system.

Table (3) shows that 66% of studied women felt body aches, and 68% of them suffered from psychological problems and depression. Also, 72% of studied women suffered from anorexia. Regarding the chemotherapy effect on heart and blood vessels 58% felt unable to do daily activities. Also, 62% of studied women suffered from pain during menstrual period and irregular menstruation. Regarding the effect of chemotherapy on different senses of the body 42% of studied women suffered from recurrence of respiratory infections. Regarding the effect of chemotherapy on muscles and bone 56% of studied women

suffered from bone pain. In addition, 72 % of the studied women suffered from loss of hair.

Table (4) demonstrates that 70% of studied women suffered from frequent headaches and losing weight. Also, 72% of them suffered from loss of appetite. Regarding the radiotherapy effect on kidney 60% of studied women suffered from recurrent urinary tract infections. Regarding effect of radiotherapy on reproductive system 68% of studied women suffered from diminished sexual arousal and 76% of them suffered from loss of lipido. Regarding the effect of radiotherapy on different senses of the body 46% of studied women suffered from hearing disorders. In addition, 56 % of studied women suffered from pain in bones. Regarding the effect of radiotherapy on the skin 50% of studied women suffered from inflammation of the lining of the mouth and the presence of painful ulcers, and 48% of them suffered from dry skin and recurrent infections and difficult to heal wounds.

Table (1): Distribution of the studied women according to general characteristics (n=50).

General characteristics	No	%
Age (years)		
25 < 35	2	4.0
35 < 45	11	22.0
45 < 55	21	42.0
≥ 55	16	32.0
Mean ±SD	47.82±7.25	
Educational level		
Illiterate	1	2.0
Primary education	17	34.0
Secondary education	14	28.0
University education	18	36.0
Marital status		
Single	0	0
Married	43	86.0
Widow	7	14.0
Occupation		
Housewife	36	72.0
Working	14	28.0
Residence		
Urban	22	44.0
Rural	28	56.0
Family type		
Extended	30	60.0
Nuclear	20	40.0
Monthly income		
Enough	20	40.0
Not enough	30	60.0

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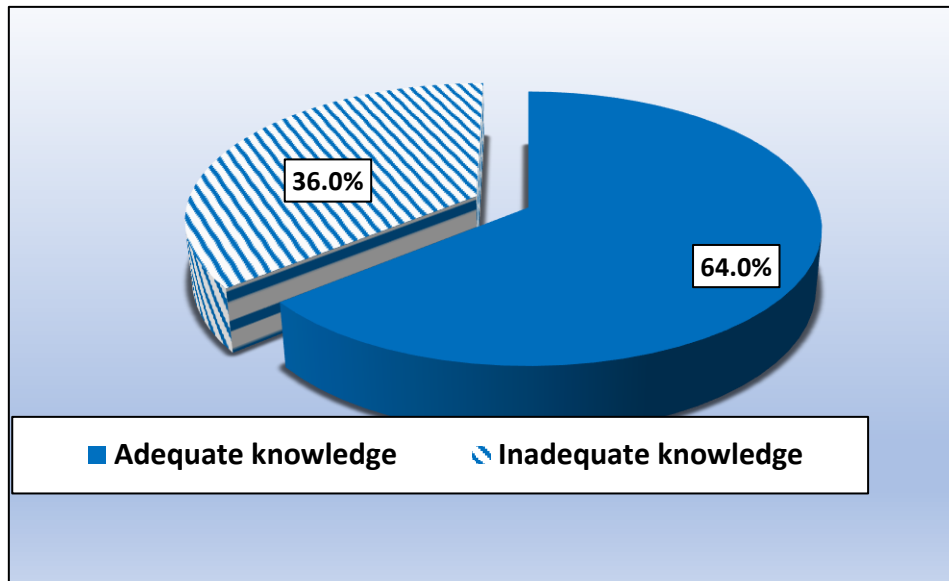


Figure (1): Distribution of studied women regarding total knowledge about cervical cancer (n=50)

Table (2): Distribution of studied women according to their total knowledge regarding effects of chemotherapy and radiotherapy on body systems (n=50).

Items	No	%
Total knowledge regarding effects of chemotherapy on body systems		
Adequate	34	68.0
Inadequate	16	32.0
Total knowledge regarding effects of radiotherapy on body systems		
Adequate	31	62.0
Inadequate	19	38.0

Table (3): Distribution of studied women according to effect of chemotherapy on the body system (n=50).

Body system	Yes		No	
	No	%	No	%
Effect of chemotherapy on general health				
Suffer from fatigue and exhaustion	32	64.0	18	36.0
Feel body aches	33	66.0	17	34.0
Suffer from insomnia and lack of sleep	27	54.0	23	46.0
Find it difficult to do daily activities	33	66.0	17	34.0
Effect of chemotherapy on the immune system				
Suffer from weak immunity and frequent infections	32	64.0	18	36.0
Suffer from recurrent infections	32	64.0	18	36.0
Suffer from frequent high fever	20	40.0	30	60.0
Effect of chemotherapy on the central nervous system				
Suffer from numbness in the toes and hands	24	48.0	26	52.0
Feel a shiver in the body	16	32.0	34	68.0
Get severe and frequent headaches	28	56.0	22	44.0
Find it difficult to focus	28	56.0	22	44.0
Suffer from memory disorders	19	38.0	31	62.0
Suffer from psychological problems and depression	34	68.0	16	32.0
Effect of chemotherapy on the digestive system				
Suffer from anorexia	36	72.0	14	28.0
Suffer losing weight	35	70.0	15	30.0
Suffer from nausea and vomiting	32	64.0	18	36.0
Suffer from frequent constipation	19	38.0	31	62.0
Suffer from frequent diarrhea	16	32.0	34	68.0
Have difficulty chewing and swallowing	29	58.0	21	42.0
Suffer from heartburn	17	34.0	33	66.0
Effect of chemotherapy on the respiratory system				
Suffer from recurring respiratory infections	21	42.0	29	58.0
Feel difficult to breathe	26	52.0	24	48.0
Feel chest pain	25	50.0	25	50.0
Have a dry or sputum-producing cough	19	38.0	31	62.0
Effect of chemotherapy on the heart and blood vessels				
Feel palpitations and an increased heart rate	23	46.0	27	54.0
Feel unable to do daily activities	29	58.0	21	42.0
Suffer from low blood pressure	15	30.0	35	70.0
Suffer from high blood pressure	13	26.0	37	74.0
Suffer from swelling of the face and extremities	19	38.0	31	62.0
Feel dizzy	28	56.0	22	44.0
Have a shortage of red blood cells	22	44.0	28	56.0
Have a low platelet count	20	40.0	30	60.0
Effect of chemotherapy on the kidneys				
Suffer from a bladder infection	21	42.0	29	56.0
Suffer from urinary incontinence	23	46.0	27	54.0
Suffer from urinary tract obstruction	14	28.0	36	72.0
Suffer from urinary retention	17	34.0	33	66.0
Have difficulty urinating	23	46.0	27	54.0
Suffer from frequent urge to urinate	14	28.0	36	62.0
Suffer from blood in urine	23	46.0	27	54.0

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Cont. Table (3): Distribution of studied women according to effect of chemotherapy on the body system (n=50).

Body system	Yes		No	
	No	%	No	%
Effect of chemotherapy on the reproductive system				
Suffer from pain during menstrual period	31	62.0	19	38.0
Suffer from irregular menstruation	31	62.0	19	38.0
Have bleeding between periods	24	48.0	26	52.0
Suffer from menopause	13	26.0	37	74.0
Suffer from infertility	0	0.0	50	100.0
The effect of chemotherapy on the different senses of the body				
Suffer from hearing disorders such as tinnitus	23	46.0	27	54.0
Suffer from temporary hearing loss	8	16.0	42	84.0
Feel an imbalance due to middle ear infections	12	24.0	38	76.0
Feel weakness in vision	21	42.0	29	58.0
Suffer from blurred vision	22	44.0	28	56.0
Feel unable to taste foods	13	26.0	37	74.0
Effect of chemotherapy on muscles and bones				
Feel bone pain	28	56.0	22	44.0
Feel stiff in the neck	17	34.0	33	66.0
Feel muscle pain	27	54.0	23	46.0
Suffer from muscle weakness	17	34.0	33	66.0
Suffer from osteoporosis	14	28.0	36	72.0
Suffer from joint pain	24	48.0	26	52.0
Suffer from frequent fractures	16	32.0	34	68.0
Effect of chemotherapy on the skin				
Feel itchy skin	18	36.0	32	64.0
Suffer from changing the color of the skin to dark red	19	38.0	31	62.0
Sensitive to light and sun	26	52.0	24	48.0
Suffer from weak nails, which are brittle and thin, which leads to easy breakage	21	42.0	29	58.0
Suffer from discoloration of the nails	14	28.0	36	72.0
Suffer from pallor skin	21	42.0	29	58.0
Suffer from loss of hair	36	72.0	14	28.0
Suffer from scars in the mouth	25	50.0	25	50.0
Easy to bleed	19	38.0	31	62.0
Suffer from edematous skin	21	42.0	29	58.0

Table (4): Distribution of studied women according to effect of radiotherapy on the body system (n=50).

Body system	Yes		No	
	No	%	No	%
Effect of radiotherapy on the nervous system				
Suffer from frequent headaches	35	70.0	15	30.0
Suffer from numbness in the extremities	14	28.0	36	72.0
Feel imbalanced	18	36.0	32	64.0
Find it difficult to speak	9	18.0	41	82.0
Suffer from inability to control defecation	9	18.0	41	82.0
Effect of radiotherapy on the digestive system				
Suffer from nausea and vomiting	32	64.0	18	36.0
Suffer from loss of appetite	36	72.0	14	28.0
Losing weight	35	70.0	15	30.0
Suffer from infections in the rectum	11	22.0	39	78.0
Suffer from intestinal infections	16	32.0	34	68.0
Suffer from a blockage in the small intestine	3	6.0	47	94.0
Suffer from ascites	11	22.0	39	78.0
Have difficulty chewing and swallowing	29	58.0	21	42.0
Suffer from frequent constipation	19	38.0	31	62.0
Suffer from frequent diarrhea	16	32.0	34	68.0
Effect of radiotherapy on the respiratory system				
Suffer from recurring respiratory infections	21	42.0	29	58.0
Feel difficult to breathe	26	52.0	24	48.0
Feel chest pain	25	50.0	25	50.0
Suffer from a lot of coughing	19	38.0	31	62.0
Effect of radiation therapy on the heart and blood vessels				
Suffer from low blood pressure	15	30.0	35	70.0
Suffer from high blood pressure	13	26.0	37	74.0
Suffer from clots and other heart problems	6	12.0	44	88.0

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Cont. Table (4): Distribution of studied women according to effect of radiotherapy on body system (n=50).

Body system	Yes		No	
	No	%	No	%
The effect of radiotherapy on the kidneys				
Feel a burning sensation while urinating	18	36.0	32	64.0
Suffer from recurrent urinary tract infections	30	60.0	20	40.0
Suffer from kidney problems	5	10.0	45	90.0
Suffer from a bladder infection	7	14.0	43	86.0
Suffer from urinary retention	7	14.0	43	86.0
Have difficulty urinating	23	46.0	27	54.0
Suffer from frequent urge to urinate	23	46.0	27	54.0
The effect of radiotherapy on the reproductive system				
Have pain during sexual intercourse	33	66.0	17	34.0
Suffer from diminished sexual arousal	34	68.0	16	32.0
Suffer from loss of libido	38	76.0	12	24.0
Suffer from dissatisfaction with the sexual relationship	23	46.0	27	54.0
Suffer from narrow vaginal opening	31	62.0	19	38.0
Suffer from repeated infections of the reproductive system	29	58.0	21	42.0
The effect of radiotherapy on the different senses of the body				
Suffer from hearing disorders	23	46.0	27	54.0
Suffer from vision problems	21	42.0	29	58.0
Suffer from loss of the ability to smell	13	26.0	37	74.0
Suffer from poor vision	21	42.0	29	58.0
Feel unable to taste foods	22	44.0	28	56.0
The effect of radiotherapy on muscles and bones				
Feel pain in the bones	28	56.0	22	44.0
Feel muscle pain	27	54.0	23	46.0
Suffer from muscle weakness	14	28.0	36	72.0
Suffer from osteoporosis	14	28.0	36	72.0
Suffer from repeated fractures	16	32.0	34	68.0
The effect of radiotherapy on the skin				
Suffer from nail problems such as weak nails, which are brittle and thin, which leads to easy breakage	21	42.0	29	58.0
Suffer from dry skin	24	48.0	26	52.0
Suffer from inflammation of the lining of the mouth and the presence of painful ulcers	25	50.0	25	50.0
Suffer from recurring infections and difficult to heal wounds	24	48.0	26	52.0
Suffer from cellulitis	10	20.0	40	80.0

Discussion:

Cancer is presently the foremost contributor to fatalities in numerous global regions. Remarkably, cervical cancer is also one of the most avoidable cancer and ranks among the most common cancer types in women on a global scale, standing as the fourth most widespread cancer and the fourth principal contributor to cancer-related fatalities among women worldwide. Nevertheless, in nations lacking access to screening and preventive initiatives for cervical cancer, it continues to exert a considerable toll on cancer-related illness and death (**Keneema, 2018**).

Treatment of cervical cancer either with chemotherapy or radiation has many effects on different body systems, radiation side effects vary depending on the dose of radiation and the length of the treatment and may be short-term side effects that occur during treatment or within a few weeks and can take several weeks to get better such as fatigue, bladder and bowel changes, skin redness, soreness and swelling, hair loss, vaginal discharge, menopause, and pelvic fractures (**Kumar & Gupta, 2016**).

The current study aimed to study the effect of chemotherapy and radiation treatment on body systems among women suffering from cervical cancer and the aim was achieved through the current study results.

Regarding study sample's general characteristics, the current study result showed that near a half of them aged $45 < 55$ years, with Mean 47.82 ± 7.25 years, more than one third of them had university education, these results are congruent with **Tapera et al., (2019)** who found that the mean age of participants enrolled in the survey was 52 years. While the majority of the study subjects were illiterate.

From the researchers' point of view the similarity of samples' age distribution depends on the different population characteristics due

to geographical, social, cultural and racial issues, these factors intricately shape the demographic composition of the studied sample and can shed light on the broader implications of the findings. It underscores the importance of recognizing diversity within the broader population.

Regarding marital status, most of the studied women were married and more than two thirds of them were housewives and more than half of them had not enough monthly income. These results agree with **Hassan et al., (2022)** who stated that the majority of study sample were married and had a low level of family income.

Regarding total knowledge about cervical cancer, the current study results illustrated that about two thirds of the studied women had adequate knowledge about cervical cancer. Theses finding was in contrast with **Heydarzadeh et al., (2020)**, who stated that more than half of studied women had poor knowledge regarding cervical cancer.

Regarding total knowledge about effects of chemotherapy on body systems, the current study showed that more than two thirds of studied women had adequate knowledge about effects of chemotherapy on body systems, this finding disagreed with **Zahid et al., (2022)**, who studied awareness and practices related to cervical cancer among females in Saudi Arabia and argued that women's knowledge level was low, as they don't have such high awareness because some social and cultural reasons in this region. From the researchers' point of view cancer patients mainly may try to understand their medical issues and how to deal with it as it's a very critical disease and not like other chronic diseases.

Regarding the effect of chemotherapy on women's general health, the current study showed that more than two thirds suffered from fatigue and exhaustion and feel body aches and found it difficult to do daily

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activities. Regarding the effect of chemotherapy on immune system nearly two thirds of them suffered from weak immunity and frequent infections and suffered from recurrent infections. Concerning the effect of chemotherapy, more than two thirds of the studied women suffered from psychological problems and depression and more than half of them found it difficult to focus and had severe and frequent headaches.

In the same line **Almohammadi et al., (2020)** who conducted an assessment study of patients' knowledge in managing side effects of chemotherapy in King Abdul-Aziz university hospital found that his study subjects suffered nausea, hair loss, feel body aches, insomnia and lack of sleep, infections due to low immunity, headache and mood swings.

Regarding effect of chemotherapy on digestive system more than two thirds of studied women suffered from anorexia, loss of weight and nausea and vomiting. Regarding the effect on respiratory system, more than half of studied women had difficulty breathing and chest pain. According to **Parker et al., (2020)** found that most of his study subjects suffered from depression episodes, respiratory problems, weight loss and generalized body aches which is concurrent with the current study findings.

Regarding chemotherapy's effect on heart and blood vessels and kidneys, the current study results showed that more than half of the studied women were unable to do daily activities, felt dizzy, and less than half of them had urinary incontinence, difficult urination, and blood in urine. These results agreed with **Heydarzadeh et al., (2020)** who mentions that the majority of his study subjects experienced tiredness, drowsiness, difficult urination and suffered from blood in urine.

Concerning the effect of chemotherapy on reproductive system, the current study

concluded that nearly two thirds of studied women suffered from pain during period and irregular menstruation. Regarding the effect of chemotherapy on different senses of the body, the current study showed that less than half of the studied women suffered from hearing disorders such as tinnitus, blurred vision and felt weak in their vision which is in the same line with **Haghi-Aminjan et al., (2018)** who found that studied women reported vision and hearing problems.

Regarding effects of chemotherapy on the results of the current study showed that more than half of the studied women had bone pain, muscles pain and weakness. While regarding the effects of chemotherapy on the skin, more than two thirds of the studied women suffered from loss of hair and their skin was sensitive to light and sun respectively. In the same line **Schirrmacher, (2019)** who reported that most types of chemotherapy induced side effects were fatigue, increased sensitivity, and muscle weakness.

Regarding women's knowledge about effect of radiotherapy on body system the current study findings concluded that more than half of studied women had adequate level of knowledge regarding effect radiotherapy on body system. In contrast **De Felice et al., (2023)** who conducted survey on knowledge and attitudes by the Italian women toward radiotherapy stated that his study subjects reported low knowledge levels regarding radiotherapy which is opposing the current study results.

While, regarding the effect of radiotherapy on the studied women's central nervous system the current study results showed that more than two thirds of women suffered from frequent headache. This result agrees **Almohammadi et al., (2020)** who stated that radiotherapy has many side effects on general health such as headache, tiredness and local pain.

Regarding effect of radiotherapy on the studied women's digestive system the current study results showed that more than two thirds of the studied women suffered from loss of appetite and loss of weight. Regarding effect on respiratory system, more than half of the studied women felt difficulty in breathing and chest pain. While regarding radiotherapy effect on heart and blood vessels, only more than one quarter of the studied women suffered from low and high blood pressure, regarding effect of radiotherapy on the kidneys, more than half of women suffered urinary tract infection. On the other hand the current study disagree with **Parker et al., (2020)** found that radiotherapy has no effect on respiratory system, weight loss and generalized body aches.

Regarding the effect of radiotherapy on Reproductive system on women suffered loss of libido and diminished sexual arousal. While effect on different senses of the body the current study results showed that women suffered from hearing disorders, unable to taste food and suffered from poor vision. **Heydarzadeh et al., (2020)**, who opposed the current study findings as he stated that radiotherapy has no effect on sexual desire, loss of hearing, taste or vision but may have negative effect on reproductive system cells through radiation.

Regarding effect of radiotherapy on studied women's muscles and bones the current study results showed that more than half of women felt bone and muscle pain. Regarding the effects of radiotherapy on the skin studied women suffered from inflammation of the lining of the mouth, the presence of painful ulcers, dry skin, recurring infections and difficult to heal wounds. which is on the same line with **Haghi-Aminjan et al., (2018)**, who reported that more than two thirds of studied women had muscle aches and mouth ulceration.

From the researchers' point of view this variance in effect of radiotherapy and chemotherapy on different body systems may be due to variations in the sensitivity of different cell types to the treatments, variations in the genetic makeup of individuals, and the complex interactions between the treatments and the body's physiological processes. Additionally, factors such as the stage and type of cancer, overall health status, and the women's immune response could contribute to the observed variances.

Conclusion:

Two-thirds of studied women had adequate knowledge regarding cervical cancer. About two-thirds had adequate knowledge regarding chemotherapy and radiation treatment. This study revealed that chemotherapy and radiation treatment had significant effect on different body system of the studied women, The aim of the study was achieved and research questions were answered.

Recommendations:

- Implementing health educational programs to improve women's awareness regarding cervical cancer.
- Implementing Health education for the women suffering from cervical cancer and receiving chemotherapy and radiation treatment about the side effects that may cause by treatment and the ways to alleviate it.
- Implementing an educational program about risk factors and preventive measures for cervical cancer.
- Assessing the health problems among women with cervical cancer before and after starting treatment.
- Implementing educational program for improving quality of life for women suffering from cervical cancer.

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تأثير العلاج الكيميائي والعلاج الإشعاعي على أجهزة الجسم بين السيدات اللاتي تعانين من سرطان عنق الرحم

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سرطان عنق الرحم مشكله صحية عالميه بين النساء وله تأثير على معدلات الإصابة بالأمراض والوفيات. تهدف هذه الدراسة إلى دراسة تأثير العلاج الكيميائي والعلاج الإشعاعي على أجهزة الجسم بين السيدات اللاتي تعانين من سرطان عنق الرحم. وقد هدفت هذه دراسة الي تقييم تأثير العلاج الكيميائي والعلاج الإشعاعي على أجهزة الجسم بين السيدات اللاتي تعانين من سرطان عنق الرحم. وتم استخدام تصميم وصفي لتنفيذ الدراسة وقد أجريت الدراسة في مستشفى الأورام بالمنوفية حيث تم استخدام عينة هادفة في الدراسة. وقد اشتملت الدراسة على 50 سيدة. وقد أسفرت الدراسة عن النتائج التالية: كان لدى حوالي ثلثي السيدات اللاتي شملتهن الدراسة معلومات عامة كافية فيما يتعلق بسرطان عنق الرحم، وأكثر من ثلثيهن لديهن معلومات إجمالية كافية فيما يتعلق بالعلاج الكيميائي وأقل من ثلثيهن لديهن معلومات إجمالية كافية فيما يتعلق بالإشعاعي. توجد علاقة ذات دلالة إحصائية بين معلومات السيدات والمستوى التعليمي والمهنة، في حين لا توجد علاقة ذات دلالة إحصائية بين معلومات السيدات والعمر والحالة الاجتماعية والإقامة ونوع الأسرة والدخل الشهري. كان لدى حوالي ثلثي السيدات اللاتي شملتهن الدراسة معلومات كافية بسرطان عنق الرحم في حين أن الثلث لديهن معلومات غير كافية فيما يتعلق بسرطان عنق الرحم. واوصت الدراسة بتطبيق برنامج تثقيفي لتحسين وعي السيدات تجاه سرطان عنق الرحم .