Effect of Educational Program on Knowledge and Quality of Life for Elderly Women with Cervical Cancer

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Abstract:

Background: The general level of knowledge of elderly women with cervical cancer is inadequate especially among elderly women. So, it is imperative to increase awareness about cervical cancer, palliative care and dispel myths and misconceptions to improve their quality of life.

Aim: This study aimed to evaluate the effect of educational program on knowledge and quality of life for elderly women with cervical cancer.

Methods & Materials: A quasi- experimental design was used in this study and applied on 60 elderly women who suffered from cervical cancer, purposively assigned according to study inclusion criteria, conducted at outpatients' gynecological oncology at outpatient clinic at Zagazig University Hospitals.

Tools: Two tools were used for data collection: A structured interview questionnaire and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Cervical Cancer Module (EORTC QoL-CX24).

Results: The study findings reveal that total knowledge among studied elderly women throughout the study phases was improved in post intervention than pre intervention, where satisfactory knowledge was 38.3% pre intervention and increased to 71.7% post intervention. Also, there was highly statistically significant improvement in total functional mean score and total symptoms mean score at post program than preprogram. There was statistically significant relation between total knowledge of studied participants regarding cervical cancer and education. Also, there was statistically significant relation between total cancer quality of studied elderly women and marital status post the program

Conclusion: Educational program is effectively improving knowledge and quality of life of studied elderly women with cervical cancer.

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Keywords: Knowledge, quality of life, elderly women, cervical cancer.

Introduction:

Cervical cancer is a major public health problem; it is the 4th mostly common cancer and the 4th leading cause of deaths between females around the world. It is the second most common cancer in low- and middle-income countries and remains one of the gravest threats to women's lives **(Bray et al., 2018)**. Globally, one woman dies of cervical cancer every two minutes and disproportionately afflicts the poor **(World Health Organization, 2018)**. In Egypt, cervical cancer ranks the 13th most frequent cancer among women and 1320 women are diagnosed with cervical cancer and 744 die from the disease **(Egypt human Papillomavirus and Related Cancers, Fact Sheet, 2021)**.

Prevention, early diagnosis, and treatment have been shown to reduce mortality due to cervical cancer. Many countries have significantly reduced morbidity and mortality through cervical cancer screening education and early treatment. In the United States, the introduction of the Pap smear has been responsible for a 90% decrease in deaths from cervical cancer. Early detection through cervical cancer screening has decreased the incidence of cervical cancer by 50% over the last 30 years **(Fawzy et al., 2023)**.

Developments in the prevention and screening of cervical cancer are taking place so; the benefits must be utilized by all women, including those living in developing countries. Good knowledge and awareness will help ensure the disease's burden does not increase. Moreover, the cost of treating late-stage cervical cancer is substantially higher than that of early-stage cancer **(Mwangelwa., 2020)**. Virtually all cervical cancer cases (99.0%) are linked to genital infection with human papillomavirus (HPV), which is the most common viral infection of the reproductive tract **(Hassan et al., 2021)**. The development of cervical cancer is a multi-stage process that generally occurs over many years and nearly always begins with a woman's infection with an oncogenic type of the human papillomavirus (HPV) **(Masaud et al., 2021)**.

Lack of knowledge about HPV and low understanding of the importance of HPV vaccination directly affect women's participation in cervical cancer screening. Despite this, the importance of health education as an integral part of primary prevention for cervical cancer is often ignored. Cancer incidence can be reduced by controlling the causes and risk factors. Health education includes presenting knowledge about cervical cancer prevention may be the key to changes in knowledge and preventive measures **(Said et al., 2018)**.

The current approach in cancer management focuses on clinical care and is holistic, looking beyond morbidity and mortality, hence the need to assess QOL to individualize treatment and improve the

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QOL. Therefore, the WHO has defined QOL as the subjective perception of the impact of disease and treatment on an individual's health status as regards physical, psychological, social, and functional well-being **(Owenga, 2019)**. As a result, QOL has gained keen attention among various countries **(Thapa et al., 2018)**.

Method

Study Design and Setting

A quasi- experimental design was utilized to conduct the current study from April 2022 up to the end of April 2023 at the gynecological oncology outpatient clinic in Zagazig University Hospitals at Zagazig City.

Sample

A purposive sampling technique consisted of 60 elderly patients with cervical cancer from the above-mentioned setting who met the following criteria: Age 60 years and older with a diagnosis of cervical cancer, self-independent women, women at second and third stage of cervical cancer, women receiving chemotherapy or radiotherapy or had a surgical treatment or a combination of them and able to communicate and accept to participate in the study.

Sample size calculation

It was calculated by statistical computer program (Epi-Info software version 6.04). It was based on assuming that the need to palliative care was 72.8 % vs 33.3% in moderate vs high quality of life (Kamel et al.,2021). At 80% power and 95 % confidence level, the sample size calculated was 60 subjects.

Tool of data collection

Two tools were used for collection of data. **Tool I:** A structured interview questionnaire that was developed by the researchers based on the literature review. It is composed of four parts: **First part:** Demographic characteristics. **Second part:** Medical, obstetrical, and gynecological history of the studied elderly women. **Third part:** Elderly women's knowledge about cervical cancer. **Fourth Part:** Elderly women's knowledge about palliative care.

Medical history includes past history for hypertension, DM, heart diseases, smoking where active or passive, sexually transmitted diseases, immune diseases and other cancer than the current cervical cancer. **Obstetrical history** includes mode of delivery, number of paras, abortion, had ovarian cysts, uterine fibroid, had hysterectomy, type of hysterectomy (e.g., total, partial, radical, modified radical). As well as had ovariectomy, fallopian tube excision, excision of fallopian tube and ovary. **Gynecological history** as diagnosis of cervical cancer date per months, stage of cervical cancer, current complaints, treatment regimen, number of chemotherapy doses before surgery, after surgery, number of radiotherapy session.

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Elderly women's knowledge about cervical cancer was developed by the researcher in simple Arabic language guided by available literature **(Chellapandian et al.,2021; Henke et al., 2021 & Bogale et al., 2021)** to collect the necessary data for assessing the women knowledge about cervical cancer as; definition, types, signs and symptoms, risk factors, causes, necessary tests to detect the cervical cancer, stages, methods of treatment and complications.

Elderly women's knowledge about palliative care was developed by the researcher in simple Arabic language guided by available literature **(Krakauer et al., 2021; Tapera & Nyakabau 2020; Stal et al., 2022; Chosich et al., 2020 & Kostopoulou et al., 2018)** to collect the necessary data for assessing the women knowledge about palliative care as; definition of palliative care and body symptoms which includes non-pharmacological ways to relieve pain caused by chemotherapy, tiredness and exhaustion, nausea and vomiting, treating changes in skin caused by radiotherapy, urine leakage, …etc.). Also, psychological symptoms as; non-pharmacological ways to treat anxiety and fear, feelings of distress and sadness, depression, loss of body image).

Scoring system

The total score was ranged from 0-40 grades for each item. The correct answer was allotted one grade and zero for wrong answer or don't know. The knowledge scores were depending on the numbers of grades the participant obtained regarding all questions. The total grade was computed out of fourteen (40) grades and knowledge was considered satisfactory if the percent score was 60% or more (>24grade) and unsatisfactory if less than 60% (< 24grade).

Tool II: The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Cervical Cancer Module (EORTC QoL-CX24) (Greimel et al., 2006)

This tool is a complementary questionnaire specific for cervical cancer patients The EORTC-CX24 questionnaire consists of 24 questions and includes 3 multi-item scales (symptom experience, body image, sexual/vaginal functioning) and 6 single-item scales (swelling in one or both legs, tingling or numbness in hands or feet, hot flushes and or sweats, worried that sex would be painful, sexually active, sexual activity enjoyable for you). These items are divided into those assessing **functioning** (sexual/vaginal functioning, sexual activity, sexual enjoyment) and those assessing **symptoms** (symptom experience, lymphedema, body image, peripheral neuropathy, menopausal symptoms, sexual worry). The questionnaire uses a four-point response scale (not at all, a little, quite a bit, very much).

EORTC QoL-CX24 scoring system:

The results are presented in mean, standard deviation, and percentages. A high scale score represents a higher response level. Thus, a high score for a Functional Scale represents a high / healthy level of functioning or higher QOL, whereas a high score for a Symptom Scale represents a high level of

symptomatology / problems. All measures ranged in score from 0 to 100 to process according to the EORTC scoring manual. The QLQ-CX24 scores of the scales evaluating symptoms were divided into two groups: High, if the score was ≤60. Low, if the score was ≥60. The scores of the functioning scales were divided into two groups: High, if the score was ≥60. Low, if the score was ≤60.

EORTC QoL-CX24 scale	High Quality of Life	Low Quality of Life
Symptoms scale	≤60	>60
Functioning scale	>60	≤60
Total Quality of life	≥ 66.7	≤ 33.3

Educational Program
Assessment phase:

Pre-program data collection for baseline assessment was done at this phase. The researcher interviewed each participant who met the study inclusion criteria individually. Then introduced her, briefly described the purpose of the study, asked for their agreement to participate in it, and assured them that the knowledge they provided was completely confidential and would only be used for research. The researcher read and explained each item of the study scales to the elderly and then recorded his/her response to each item. Each patient's data collection took approximately 25 to 30 minutes to complete. The data were initially analyzed to serve as a basis for developing the educational program in accordance with recognized needs.

Planning phase:
In the light of the results of the data analysis conducted during the assessment phase, and in view of the relevant literature about elderly with liver cirrhosis, as well as according to the needs of the studied elderly and the study's goals, the researcher created the educational program and session's content.

Implementation phase:
The program was implemented in the study setting in the form of six sessions for small groups. This was carried out to increase the opportunities for discussions, interactions. The total sample was divided into small groups (3 to 5 elderly in each group). The same teaching strategies, materials, discussions, and booklet were used with all groups to provide the identical contents. The rate of two sessions per month. The length of each session was variable (30 to 45) minutes according to elderly's responses and active participation, as well as the time available, and the content of each session. The fieldwork was executed over a period of twelve months, starting from the beginning of April 2022 up to the end of April 2023. Three days per week (Saturday, Monday, and Wednesday) from 9:00 AM to 1:00 PM. As one month to do list for patients and take pilot study, two months for pre-test, eight months for program sessions. and finally, one month for post-test. This included the phases of assessment, planning, implementation, and evaluation of the program.

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Each session began with a summary of the knowledge presented in the previous session and the goals of the new one, taking into account the use of straightforward language that suited the understanding level of the studied elderly patients. During the session, motivational and reinforcement strategies like praise and acknowledgment were utilized to increase active involvement and promote learning. In addition to the booklet, the sessions were supported using images, posters, and power point.

Evaluation phase:

The evaluation of the effectiveness of the educational program (posttest) was done just after completion the program. These were done using the same data collection tools of the pre-test.

Ethical Considerations

The study was approved by the Research Ethics Committee (REC) of the Faculty of Nursing at Zagazig University in December 2021. An informed consent for participation was taken verbally from each of the elderly subjects after being properly informed of its purpose. Participants were given the option to decline participation and informed that they might leave at any time during the data collecting interviews. They were also given the assurance that the knowledge would be kept private and used exclusively for the research purpose.

Statistical analysis

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and means and standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the developed scales through their internal consistency. Quantitative continuous data were compared using the non-parametric Mann-Whitney or Kruskal-Wallis tests and paired t test. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of the scores of knowledge, cancer Qol and symptoms Qol, multiple linear regression analysis was used and analysis of variance for the full regression models was done. Statistical significance was considered at p- value <0.05.

Results

Demographic characteristics of the studied elderly women(n=60).

Table 1 displays that, mean age the studied elderly women was 66.07±2.46 years and 81.7 % of the elderly women were married at 13-20 years. As for the number of marriages for husband and wife, it was obvious that 63.3% and 45% respectively were married 2-3 times. Concerning to residence and living, the same table reveals that 55% and 96.7% of women were residing in rural area and living with one family.

level of education among the studied elderly women (n=60).

As displayed in **Figure 1**, it was presented that 30% of the elderly women with cervical cancer in the study sample were illiterate and only 6.7% had a secondary education.

Medical history of the studied elderly women (n=60).

Represents that all the studied elderly women with cervical cancer were suffered from chronic diseases and hypertension was the most common one in 83.3 % of them, followed by heart diseases in 75%. As for the previous history of STD, it was found that 75% of the studied elderly women had a history of STD and HPV was the most common type in 80%. Meanwhile, the previous history to immune disease was present in only 18.3% (Table 2).

Obstetrical and gynecological history of the studied elderly women (n=60).

Clarifies that 63.3% of the studied elderly women with cervical cancer were delivered normally and 48.3% of them were multipara >3, while 38.3% of them were without abortion. As for the gynecological history, it was found that 60% of the studied elderly women had hysterectomy and modified radical hysterectomy was the most common type in 28.3% and ovariectomy, fallopian tube excision and excision of fallopian tube and ovary were present in 60%, 53.3% and 55% respectively (Table 3).

Cervical cancer data of the studied elderly women (n=60).

Shows that the mean age of duration of cervical cancer diagnosis per month was around 8.90 ± 4.22, and all the women 100% were treated with chemotherapy and 80% of them were had 2-7 cycle of chemotherapy before surgical treatment. As for the radiotherapy session it was found that 50% of women were receiving radiotherapy and 23.3% had 6-9 session (Table 4).

Stage of cervical cancer.

Figure 2 demonstrates that 53.3% of elderly women with cervical cancer were in third stage, while 46.7% of them were in second stage.

Total knowledge among studied elderly women throughout the study phases n=60.

Portrays that the total knowledge among studied elderly women throughout the study phases was improved in post intervention than pre intervention, where satisfactory knowledge was 38.3% pre intervention and increased to 71.7 % post intervention (Table 5).

EORTC QLQ-Cx24 items mean score among cervical cancer elderly women' pre and post the program n=60.

Represents that the total functional mean score was improved from 34.44±43.99 pre intervention to 58.29±87.49 post intervention and the total symptoms mean score were decreased from 45.92±30.37 pre intervention to 23.72±20.94 post intervention with highly statistically significant (Table 6).

Total cervical cancer quality of life throughout the study stage.

Figure 3 illustrates that 58.3% of women had low quality of life pre intervention and this percentage was decreased to 30% post intervention.

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Relation between total knowledge regarding cervical cancer, palliative care of the studied participants and their characteristics and cervical cancer data through the study phases n=60.

Displays statistically significant relation between total knowledge of studied participants regarding cervical cancer and education. It is evident that the mean knowledge score was higher effective among illiterate elderly women (Table 7).

Relation between characteristics and cervical cancer data of the studied participants and their total cancer quality post the program n=60.

Indicates statistically significant relation between total cancer quality of studied elderly women and marital status post the program. As observed from the table, married elderly women had the highest total cancer quality of life (Table 8).

Correlation matrix of participants' knowledge and quality of life [Functional quality of life& Symptoms experience].

Indicates highly statistically significant negative correlation between functional quality of life and symptoms experience. Meanwhile there was a statistically significant negative correlation between knowledge and symptoms experience. The strongest correlation was between functional quality of life and symptoms experience (r=- 0.471) (Table 9).

Correlation matrix of participants' knowledge, quality of life and their characteristics.

Indicates a highly statistically significant positive correlation between knowledge and educational level while a statistically significant positive correlation between knowledge and residence (urban). Conversely, knowledge score had a statistical negative correlation with age. Regarding to functional quality of life score, the table indicates a highly statistically significant positive correlation between functional quality of life and marital status (Table 10).

Predictor of studied elderly women knowledge.

Regarding predictor of studied elderly women knowledge, table 11 illustrates that level of education of studied elderly women was statistically significant independent positive predictor of studied elderly women knowledge score. The model explains 36% of the variation in knowledge score as value of r-square indicates.

Predictors of studied elderly women quality of life.

As for cervical cancer quality of life, table 12 summarizes that total functional score was statistically significant independent positive predictors of cervical cancer quality of life score. Meanwhile, total symptoms score was statistically significant independent negative predictors of cervical cancer quality of life score. The model explains 29% of variation in cervical cancer quality of life score.

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Discussion

It is obvious from the present study, all studied elderly women had chronic diseases as more than half of studied elderly women had hypertension, this is attributed to comorbidities increase with age, as aging reduces vascular resistance and cardiac output, aging results in the narrowing of the vessel lumen and stiffening of the vessel walls through a process known as atherosclerosis eventually leading to hypertension.

In agreement with this finding, **Birge et al. (2022)** in **Turkey** showed that 78.4% of elderly women with cervical cancer had comorbid diseases, and the largest group was hypertension. Also, a study on **Shanghai** of **China** carried by **Wu et al. (2023)** revealed that hypertension is a chronic disease generally occurring in the elderly, because aging reduces vascular resistance and cardiac output, eventually leading to hypertension. Similarly, **Caraballo et al. (2021)** in **China** showed that blood pressure has a strong association with age and its elevation is one of the most important modifiable cardiovascular risk factors worldwide. mediated by several structural and physiological changes, hypertension prevalence progressively increases with age.

Concerning smoking or exposure to smoking, it was found that about more than half of studied elderly women were smoker or exposed to passive smoking. These findings could be attributed to nicotine had been found to suppress the immune system, allow HPV infections to persist, which had been verified to be an essential causative factor for cervical cancer, and thus increasing the risk. Besides, nicotine and its metabolite cotinine had been proved to cause DNA damage in squamous epithelial cells and thus promote tumor development.

The findings are in agreement with a study carried by **Wen et al. (2022)** in **China** who mentioned that higher daily exposure level was associated with higher risk of cervical cancer. On the same line, **Malevolti et al. (2023)** added that risk of precancerous lesions also increased rapidly after few years of smoking duration, whereas the risk of invasive cervical cancer showed a slower linear increase. On the other hand, risks of both invasive cervical cancer and preinvasive lesions linearly decreased by time since quitting, reaching the risk of never smokers about 15 years since quitting.

As regards previous history of STD, it was found that about three quarter of the studied elderly women had a history of STD and HPV was the most common type in more than three quarter of them. This could be attributed to HPV types that are transmitted through sexual contact and infect primarily the cervix, vagina, vulva, penis, and anus have been identified. One or more of these HPV types has been implicated in most cases of squamous cell carcinoma of the cervix. In agreement with this, a study in **USA** done by **Hermansson et al. (2018)** demonstrated that. Forty-three women aged 60–89 years (4.1%, 95% CI 3.0–5.5) were positive for HPV in their first test. In a second test, on average 3.5 months later, 27 women (2.6%, 95% CI 1.7–3.8) were still positive.

Likewise, **Bessa et al. (2023)** in **Brazil** found that older women with multiple sexual partners were more susceptible to HPV infection and HPV was detected in 14 (13.2%) of the 106 women assessed

in the study. In the same line, a systematic review done by **Sausen et al. (2023)** found that the link between HPV and cervical malignancy has been well established, with it being estimated that HPV is responsible for approximately 99.7% of cases of cervical cancer. Disagreement with this result, **Mancebo et al. (2022)** in **Spain** found that when comparing age specific relative contribution of HPV, "Other" genotypes and HPV negative cases was significantly higher in ≥65 years group than in the <65 years (P<0.031).

Regarding previous history to immune disease, it was found that about one quarter of studied elderly women had previous history to immune disease especially rheumatoid. This might be contributing to immune diseases and treatment-related impaired immunity, are more susceptible to HPV which cause cervical cancer. In agreement with this present study finding, a study in **Australia** by **Foster et al. (2020)** who found that most autoimmune conditions appear to increase the risk of cervical HPV infection and related disease. On the same line, a study carried in **France** by **Beydon et al. (2023)** clarified that disease burden of rheumatoid arthritis remains particularly affected by an increased cancer risk and cervical cancer was noticeably more frequent in rheumatoid arthritis. In the same stream, a study by **Bowden et al. (2023)** revealed that increased risk of cervical cancer for other autoimmune diseases, including Systemic lupus erythematosus (SLE) and rheumatoid arthritis.

Concerning obstetrical and gynecological history, about half of studied elderly women were multipara and more than half of them were delivered normally these findings may be due to concentrations of estrogen and progesterone level in blood are known to increase during pregnancy and reach the highest levels in the last weeks of gestation. These hormonal changes are perhaps responsible for the alterations in the junction between the squamous and columnar epithelium (transformation zone) occurring during pregnancy.

Squamous metaplasia of the transformation zone also increases during pregnancy to reach a maximum during the third trimester. Also, association between multiple pregnancies and cervical cancer could be due to high detection of cervical abnormalities among pregnant women, probably due to migration of endocervix during pregnancy. There are also assumptions that traumas to the uterine cervix during vaginal delivery could be responsible for cervical cancer developments.

These results go in line with the study carried by **Tekalegn et al. (2022)** mentioned that women with high parity had higher odds of developing cervical cancer compared to those with relatively low parity. Similarly, **Pimple & Mishra, (2022)** found that high parity is known to increase the risk of cervical cancer since parity and pregnancy associated hormonal changes maintains the transformation zone on the ectocervix for longer durations facilitating the direct exposure to HPV and to other cofactors. It is obvious from the present study, more than half of studied elderly women had hysterectomy, this might be due to hysterectomy with chemotherapy was more effective in treatment of cervical cancer than concurrent chemo radiotherapy CCRT and associated with higher survival rate.

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In agreement with this present study finding, a systematic review done by **Kokka et al. (2022)** showed that meta-analysis of three trials of neoadjuvant chemotherapy NACT with hysterectomy versus radiotherapy alone, assessing 571 participants, found that women who received neoadjuvant chemotherapy NACT plus hysterectomy had less risk of death than those who received radiotherapy alone.

Additionally, a systematic review done by **Wang et al. (2020)** found that minimally invasive radical hysterectomy was associated with poor survival outcomes compared to open surgery. Patients with FIGO 2009 stage ≤ IB1 cervical cancer who underwent minimally invasive surgery have lower OS and DFS rates than those who underwent open surgery. Similarly, a systematic review done by **Sun et al. (2022)** a retrospective analysis involving 116 Japanese centers, where 5964 women with FIGO IB1-IIB cervical cancer underwent radical hysterectomy, revealed a significantly decreased risk for recurrence (HR 0.69; 95% CI 0.57–0.84) and death.

The present study revealed that more than half of studied elderly women were in third stage, these findings could be attributed to lack of screening in elderly women and less visible transformation zone that delay collection of sufficient cervical samples so, elderly women are only diagnosed once they become symptomatic which is typically at later stages.

These results go in line with the study carried by **Neumeyer et al. (2023)** in **German** found that elderly women (≥65 years) are more often diagnosed with late-stage disease and have worse outcomes than younger patients. In the same context, a study conducted in **Turkey** by **Birge et al. (2022)** revealed that several studies reported that cervical cancer is detected in elderly population and diagnosed in advanced stages because of the delayed screening tests and its prognosis is poor. Similarly, **Xie et al. (2020)** in **China** demonstrated that patients aged ≥65 tended to be diagnosed with advanced stage disease, the proportion of non-treatment in them was relatively high and a few of them adopted surgery actively as main treatment.

As regards treatment regimen, all of studied elderly women were treated with chemotherapy. These findings could be attributed to chemotherapy improve the success rate of surgical resection. The findings are in agreement with **You et al. (2019)** in **China** who found that for elderly cervical cancer patients with advanced stage, definitive RT may be acceptable for patients with negative lymph nodes. However, in patients with positive lymph nodes, concurrent chemotherapy could bring about improved survival. This result is in agree with **Patel et al. (2023)** in **India** revealed that the primary treatment for patients with locally advanced cervical cancer LACC is still cisplatin combined with radiotherapy, whereas the treatment of metastatic and recurring cancer has changed more, with the addition of more advanced chemotherapeutic agents.

The findings of the current study revealed that, only one sixth of studied elderly women had satisfactory knowledge level about cervical cancer at preprogram. These were evident in all dimensions of cervical cancer knowledge. Where, more than half of studied elderly women gave incorrect answers

regarding definition, types, signs and symptoms, risk factor and causes, necessary test, stages of cervical cancer, methods of treatment and complication.

These findings could be attributed to several causes, such as more than half of the studied elderly women had lower educational level where about one third of them were illiterate, around more than three quarter of them were not work and more than half of them live in rural areas. Also, poor training of hospital staff regarding patient and family education; the elderly patients may be embarrassed to ask medical staff to gain more knowledge about their disease or don't have enough knowledge to know what to ask about.

The present study results were in agreement with a study done by **Gao et al. (2023)** in **China**, who reported that the major finding was that more than half of the women had a low level of cervical cancer knowledge, these findings associated with older age, low education level, underemployment, low family income. Similarly, **Al-Saadi et al. (2021)** in **Oman** showed that there was inadequate knowledge and awareness of cervical cancer among women aged 20–65 years.

Likewise, **Al Raisi et al. (2022)** in **Oman** found that most participants had poor knowledge of cervical cancer and HPV. Even those with a personal or family history of cervical cancer were not aware of HPV and its role. These results go in line with the study carried by **Khomphaiboonkij et al. (2023)** in **Bangkok, Thailand** who mentioned that there are several contributing factors which may impact the level of knowledge for women with cervical cancer, such as, age, socio-economic status, level of education, culture, and etc.

The present study revealed that there was major deficiency in palliative care knowledge regarding body symptoms and psychological symptoms of the studied elderly women, about more than half of studied elderly women had unsatisfactory palliative care knowledge level at pre intervention. This might be due to majority of studied elderly women were illiterate and reported that cervical cancer and palliative care were associated with stigma and linked them with the nearing of death. Also, absent of in-service educational program about palliative care or training courses which provided to women, in fact palliative care education wasn't incorporated into nursing curriculum. So, nurses lack knowledge about palliative care. Finally, lack of specific palliative care units in Egypt.

These results were supported by a study in **Zimbabwe** done by **Tapera et al. (2020)** reported that limited knowledge or poor understanding about palliative care for women with advanced cervical cancer. In the same way, a study done by **Bergman et al. (2023)** in **Holland** revealed that a minority of the respondents knew that palliative care can be provided alongside life-prolonging treatment (29.8%) and that palliative care is not only for people who have a few weeks left to live (23.5%). This indicates that misconceptions of palliative care are common among Dutch older people.

Similarly, **Diviani et al. (2023)** in **Italy** showed that lack of public awareness and knowledge about palliative care has long been considered among the main obstacles to using palliative care services. likewise, **Huo et al. (2019)** in **USA** found that more than 70% of respondents had no knowledge of

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palliative care, and only 10% of respondents had self-reported adequate knowledge of palliative care and were confident to explain the palliative care to the others. However, not all these respondents with self-reported adequate knowledge of palliative care could answer correctly on the questions asking for the goals of palliative care, and around half of these respondents still had a misconception about palliative care.

Regarding relation between total knowledge of studied participants regarding cervical cancer, palliative care and education, the present study results revealed that there was a statistically significant relation between total knowledge of studied participants regarding cervical cancer, palliative care and their education before and after educational program. The higher educational level, intermediate or university level, the higher knowledge score. In addition, the results of multivariate analysis, showed that the educational level was the only statistically significant independent positive predictor of studied elderly women knowledge score. These results could be justified by the fact that the higher educational level increases the ability to acquire new skills, perceive knowledge, easier use of various educational facilities (such as the internet, pamphlets, and educational booklets) and spending more time learning. The results of the present study agreed with a systematic review done by **Rosyda et al. (2018)** who revealed that level of education seems to be an important predictor of cancer screening participation. Rationale of these findings is well-educated women may have better interest, and better access to resources and knowledge, so they have better knowledge about health issue and behavior to improve their health. Also, they have greater awareness of risks.

Also, consistent with a systematic review done by **Murfin et al. (2020)** showed that lower levels of education can constrain health literacy because of a limited ability to read and fully comprehend the given knowledge. Similarly, **Enyan et al. (2024)** in **Ghana** indicated that women with higher levels of education, at the post-secondary or tertiary levels had better chances of having knowledge of cervical cancer than those without any formal education or less educated. Likewise, **Liu et al. (2017)** in **China** revealed that age, educational level and family income were significantly associated with a higher knowledge level. Knowledge levels in older women (aged 55–65 years) (OR = 0.48; 95% CI: 0.26–0.90) were lower in general than women aged 30–44 years.

Regarding relation total cancer quality of studied elderly women and marital status post the program, the present study results revealed that there was a statistically significant relation between total cancer quality of studied elderly women and married elderly women post the program. This due to patients with stable marriage can get more family support during treatment, and they will get more satisfaction in terms of emotional comfort and financial support. Also, cancer patients have a long treatment cycle and suffer both physically and mentally during their illness. With the progress of the disease, patients who are unmarried or have no partners are more likely to have psychological problems such as depression and loneliness, which will affect the HRQoL level.

In the same line with this result, a study conducted in **China** by **Zhao et al. (2021)** reported that HRQoL of married patients is higher than that of single patients.

Similarly, **Yuan et al. (2021)** in **China** mentioned that results of subgroup analyses for cervical cancer patients, there was an elevation in the risk of late-stage diagnosis and worse survival outcomes in all the unmarried statuses (single, divorced and widowed) compared with being married, with the increase being statically significant for most comparisons based on the 95% CI.

For correlation between knowledge of studied elderly women and symptoms experience, the present study showed a statistically significant negative correlation between knowledge of studied elderly women and symptoms experience. This may be due to majority of studied elderly women were illiterate and had lack of knowledge regarding cervical cancer screening led to majority of them diagnosed at an advanced stage. Also, many cancer patients believed completing treatment or finishing their primary treatment regimen meant they were healed, so patients stopped attending health care services. this behavior delays seeking help and non-adherence to treatment.

The results of the current study are congruent with, a study done in **Saudi Arabia** by **Heena et al. (2019)** showed that having good knowledge and awareness will help in ensuring that the disease burden does not increase. Moreover, **Alam et al. (2022)** in **Bangladesh**, who reported that lack of knowledge about cervical cancer could be a very great threat and will make the situation worse. The study result depicts a lack of knowledge regarding cervical cancer screening which may explain why most of the cervical cancers in Bangladesh remain diagnosed at an advanced stage.

Similarly, **Shrestha et al. (2022)** in **Nepal** revealed that an important factor that results in low uptake of cervical cancer screening is the lack of knowledge and awareness of the disease. Also, **Nyamambi et al. (2020)** in **Zimbabwe** reported that women with low educational achievement and low awareness of the risk factors for cervical cancer have been seen to have poor uptake of screening services.

After implementation of the current study educational program, there was statistically significant improvement of the studied elderly women knowledge about cervical cancer from about one sixth at preprogram to more than one half at post program. This might be attributed to precise and detailed educational program, which was individualized according to elderly women needs along with booklet distribution to all of the studied elderly women.

This finding finds support in the study of **Farag et al. (2024)** in **Beni-Suef** found that there was a highly statistically significant improvement in the knowledge score regarding all items of knowledge about cervical cancer at different times of assessment. This could be attributed to the ability of women to gain knowledge easily and the effectiveness of the program. Similarly, **El-Rufai et al., (2017)** in **Saudi Arabia**, stated that a well-designed health education program on cervical cancer and the benefits of screening would increase awareness among women. Similar findings supported the present study findings and showed the posttest mean was significantly higher than that of the pretest mean.

Likewise, **Fawzy et al. (2023)** in **Minia** showed that regarding total knowledge of the studied women regarding cervical cancer screening, the current study results illustrated that; less than one quarter of the participant women had poor knowledge regarding cervical cancer screening decreased to none after the educational program. This might be because the nursing educational program provided the participants with simplified and summarized knowledge that can enhance knowledge.

After implementation of the current study educational program, there was statistically significant improvement of the studied elderly women knowledge about palliative care from about two fifth at preprogram to more than three quarters at post program. This may be attributed to the use of multiple teaching methods, the development of educational program based on elderly women with cervical cancer needs, the clarity and simplicity of its content, and the use of simple language and the frequent repetition to fix such knowledge.

These results were supported by a study done by **Wong et al. (2022)** in **Hong Kong** generalist found that palliative/ End-Of-Life Care EoLC educational programs may enable health and social care professionals to refresh and extend their knowledge and skills and enhance their perceived competence in providing EoLC. Also, educational programs effectively improved social workers' confidence on symptom management and narrowed the gaps between health and social care professionals.

Similarly, **Chen et al. (2022)** in **China** showed that Knowledge of palliative care among Chinese nurses remains low, but training programs may improve general knowledge and attitudes to palliative care. Likewise, **Hao et al. (2021)** in **China** identified that the knowledge of palliative care of participants could be improved significantly by an educational intervention. On the same line, **Chang et al. (2021)** in **China** found that residents receiving palliative care instruction performed better at humanistic medical skills, especially on informing patients about the purpose of the conversation and expressing empathy.

Regarding relation between total knowledge of studied participants regarding cervical cancer and education, the present study results revealed that there was a statistically significant relation between total knowledge of studied participants regarding cervical cancer and their education before and after educational program. The higher educational level, intermediate or university level, the higher knowledge score.

In congruence with these current study findings, a systematic review done by **Murfin et al. (2020)** showed that lower levels of education can constrain health literacy because of a limited ability to read and fully comprehend the given knowledge. Similarly, **Enyan et al. (2024)** in **Ghana** indicated that women with higher levels of education, at the post-secondary or tertiary levels had better chances of having knowledge of cervical cancer than those without any formal education or less educated.

Also, consistent with **Liu et al. (2017)** in **China** revealed that age, educational level and family income were significantly associated with a higher knowledge level. Knowledge levels in older women (aged 55–65 years) (OR = 0.48; 95% CI: 0.26–0.90) were lower in general than women aged 30–44 years.

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Regarding the results of multivariate analysis, showed that the educational level was the only statistically significant independent positive predictor of studied elderly women knowledge score. These results could be justified by the fact that the higher educational level increases the ability to acquire new skills, perceive knowledge, easier use of various educational facilities (such as the internet, pamphlets, and educational booklets) and spending more time learning.

The results of the present study agreed with **Okunowo et al. (2018)** in **Nigeria** revealed that level of education was the only socio-demographic factor that was significantly associated with increased knowledge of cervical cancer disease. Likewise, a systematic review done by **Rosyda et al. (2018)** who found that level of education seems to be an important predictor of cancer screening participation. Rationale of these findings is well-educated women may have better interest, and better access to resources and knowledge, so they have better knowledge about health issue and behavior to improve their health. Also, they have greater awareness of risks. On the same line, **Aredo et al. (2021)** in **Ethiopia** showed that educational level was statistically significant predictor, which affected participants knowledge about cervical cancer screening.

Regarding total functional score and total symptoms score of the studied elderly women about cervical cancer as measured by EORTC QLQ-Cx24 at preintervention, the present study findings revealed that total functional and total symptoms mean score of studied elderly women was low at pre intervention. Rationale of this findings might be due to impact of disease and treatment on the health status of the patients.

In agreement of these results, **Somanna et al. (2022)** in **South India** showed a lower score on functional capacity on physical, role, and emotional score. The symptom scale result showed a higher score in pain (83.3) and fatigue (77.8) score among cervical cancer patients. The higher scale score for the functional scale or the global health status/ QOL represents a higher level of functioning or higher QOL, whereas the higher level of symptoms/problems for the symptom/item scales represents a higher level of dysfunction. Likewise, **Rahman et al. (2017)** in **India** found that analysis of EORTC QLQ30 and EORTC QLQCX-24 was done by multivariate regression model evaluating independent factors for different QOL indicators. Global health, total functional scale, and symptom scale were found to be lower among the higher age groups.

On the same line, **Sozzi et al. (2023)** in **Italy**, who revealed that sexual activity and sexual enjoyment (functional score) reached lower scores peri operative. Furthermore, **Thapa et al. (2018)** in **China** showed that functional scales score was low which indicate worse functioning but for symptom scales score was high which indicate more problems or symptomatology.

In congruence with this, **Singh et al. (2019)** in **India** showed that low scale score for the functional scale or the global health status/QOL, whereas the high level of symptoms/problems for the symptom/item scales. Similarly, **Ahamed & Degu (2023)** in **Kenya** indicated that 69% of study

participants with cervical cancer had poor quality of life by using EORTC CX24 while 31% of study participants had good quality of life.

After implementation of the educational program, the present study findings revealed a statistically significant improvement in total functional mean score and total symptoms mean score as measured by EORTC QoL -CX24. This is due to introducing palliative care intervention early at diagnosis on patient reported improving QoL of elderly women with cervical cancer. Also, palliative care motivates elderly women with cervical cancer to continue the treatment even with its troublesome side effects like nausea, pain, malaise, etc.

Thus, palliative care improves the compliance towards the treatment weather palliative or curative or adjuvant. Palliative care focus on management of symptoms, psychological support, and assistance of patients with decision making, also, it helps to improve the quality of care and reduce the use of medical services. Finally, delivery of palliative and oncology care in the outpatient setting lead to improved Quality of Life (QOL), reduced symptom burden, and greater satisfaction with care.

This result is on the same line as **Sanghavi et al. (2018)** in **India** who stated that EORTCCX-24 was used to assess health related QOL and cervical cancer related symptom assessment respectively. The results showed that there was significant improvement in overall health related QOL at the end of 12 weeks, in all patients who received palliative care immediately after diagnosis. Similarly, there was significant improvement in symptoms. Similarly, **Singh et al. (2019)** in **India** demonstrated cancer cervix specific QOL functional score shows statistically significant difference from baseline to post-6 months treatment in vaginal/sexual function. Meanwhile cervix cancer specific QOL symptom score has shown reduction of symptom experience (pain and fatigue) were significantly lower in both posttreatment groups (3 and 6 months).

Likewise, **Rahman et al. (2017)** in **India** revealed that patients treated for cancer cervix had better QoL after the treatment as revealed by the global health score. Assessment of functional status showed a significant improvement in physical (P = 0.04) and emotional functioning (P = 0.001) of the participants after treatment. Symptomatically, patients fared better after treatment. A cross sectional study, done by **Shylasree et al. (2021)** found that patients who undergo treatment for cervical cancer continue to have good QOL 3 years posttreatment irrespective of the type of treatment received.

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As regards correlation between knowledge, educational level and residence of studied elderly women, the present study revealed a statistically significant positive correlation between knowledge, educational level and residence (urban) of studied elderly women.

This might be related to level of education is one of the main factors to determine women's awareness of cervical cancer and women's participation in regular screening. Also, level of education and awareness in urban higher than rural. This result was supported by a study done in **China** by **Mijiti et al. (2023)** reported that age, place of residence, occupation, education level, and access to knowledge were all independent factors influencing knowledge of cervical cancer prevention and treatment, among which living in the urban area, occupation as non-farming or housewife, education level of high school or above, and four or more access to knowledge were protective factors for knowledge of cervical cancer ($P < 0.05$). Also, **Gebisa et al. (2022)** in **Ethiopia** revealed that the respondents' educational status was significantly associated with their knowledge of cervical cancer screening.

Likewise, **Siddig et al. (2023)** in **Sudan** demonstrated that knowledge about cervical cancer and HPV was positively associated with the highest education levels; in university and post-university groups (p-value < 0.001). Similarly, **Shrestha & Dhakal (2017)** in **Nepal** showed that statistically significant association was found between education level and level of knowledge regarding cervical cancer screening ($p = 0.014$). At the same time, **Warzecha et al. (2019)** in **Poland** examined 2000 women on their knowledge about the physiology of the menstrual cycle, methods of contraception, infertility, and prevention of cervical cancer, and came to different conclusions. They proved that residence in an urban area had a significant impact on the number of correct answers ($p = 0.002$). Also, **Sawicka (2021)** in **Poland** showed that women living in rural areas have less knowledge of cervical cancer than female respondents from the city. Additionally, knowledge is influenced by education level and age. The better educated a woman is the more likely she was to have more general knowledge. The older a woman is, the lower her level of knowledge.

Concerning correlation between knowledge of studied elderly women and age, the present study revealed knowledge of studied elderly women had a statistical negative correlation with their age. This might be related to advanced age associated with loss of memory. Conversely, social environment and lifestyle of the younger generations who attach closely to media in their daily life, so more knowledge is obtained.

In harmony with the present result, **Tekle et al. (2020)** in **Ethiopia** reported that women in age group 30–34 were three times more likely to have good knowledge of cervical cancer screening compared with women 45–49 years of age. Similarly, a study done in **Thai** by **Khomphaiboonkij et al. (2023)** found that only younger age (≤ 40 year) as an independent factor associated with good knowledge. Moreover, **Mijiti et al. (2023)** in **China** showed that age was independent factor influencing knowledge of cervical cancer prevention and treatment.

Conclusion

The study findings were concluded that, only one sixth of studied elderly women had satisfactory knowledge about cervical cancer at preprogram. Moreover, more than half of them had unsatisfactory knowledge about palliative care at preprogram. Additionally, more than half of studied elderly women had low quality of life at preprogram. This might be due to more than half of the studied elderly women had lower educational level where about one third of them were illiterate, around more than three quarter of them were not work and more than half of them live in rural areas. Also, poor training of hospital staff regarding patient and family education; the elderly patients may be embarrassed to ask medical staff to gain more knowledge about their disease or don't have enough knowledge to know what to ask about. Finally, applied educational program was effective in improving knowledge and quality of life of studied elderly women.

Recommendations

On the basis of the most important findings of the study, the following recommendations are suggested:

✓ More rigorous research focuses on educating women with knowledge to explore the long-term effects of cervical cancer and plan an individualized educational system for early detection and prevention to enhance uptake of cervical cancer.

✓ The myths and fears of palliative care need to be faced and addressed by patients and families, professionals and wider society for palliative care to become more acceptable.

✓ Palliative care must be readily available and integrated into the cervical cancer treatment plan for the entire course of the disease.

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Table (1): Demographic characteristics of the studied elderly women (n=60).

Demographic characteristics	Frequency	Percent
Age group: /year		
	44	73.3
60-67	16	26.7
68-73		
	66.07 ± 2.46	
Mean ± SD (range)	(60 – 73)	
Age at marriage:		
13-20	49	81.7
21-30	11	18.3
Mean ± SD (range)	18.33 ± 3.43	
	(13 – 20)	
No. of marriages for husband:		
1 time	22	36.7
2-3 times	38	63.3
No. of marriages for wife:		
1 time	33	55.0
2-3 times	27	45.0
Marital status:		
Married	47	78.3
Widower/ divorced	13	21.7

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Women occupation:		
Work	3	5.0
Not work\housewife	57	95.0
Residence:		
Rural	33	55.0
Urban	27	45.0
Living with whom:		
Alone	2	3.3
With one of family	58	96.7

Figure (1): level of education among the studied elderly women (n=60):
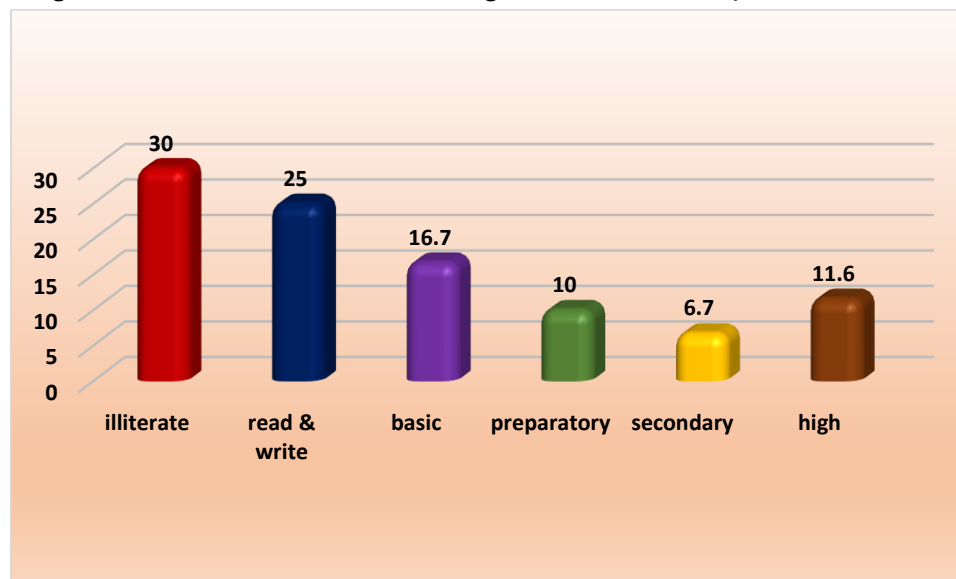
Table (2): Medical history of the studied elderly women (n=60)

Medical history	(n=60)	
	Frequency	Percent
Having any chronic diseases:		
Yes	60	100
No	0	0.0
Type of chronic diseases:		
Hypertension	50	83.3
Diabetes Mellitus	36	60.0
Heart	45	75.0
*Others	41	68.3

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Smoker or passive smoker:		
Yes	34	56.7
No	26	43.3
Had sexually transmitted diseases:		
Yes	45	75.0
No	15	25.0
Types of sexually transmitted diseases: n=45		
Chlamydia	5	11.1
Human papilloma	36	80.0
Trichomonas vaginalis	4	8.9
Having immune diseases:		
Yes No	11	18.3
	49	81.7
Types of immune diseases: n=11		
Bean anemia	2	18.2
Mediterranean anemia	2	18.2
Systemic lupus Erythematosis	3	27.3
Rheumatoid Arthritis	4	36.3
Having other cancer than the current cervical cancer:		
Yes	16	26.7
No	44	73.3
Type of cancer: n=16		
Breast	5	31.3
Colon	8	50.0
Lymphoma	3	18.7

@responses are not mutually exclusive   *others *[arthritis, cataract, osteoporosis, disc herniation, C virus, chest diseases, peptic ulcer, thyroid deficiency, brain electricity, gallbladder stones / inflammation]*

Table (3): Obstetrical and gynecological history of the studied elderly women (n=60).

Obstetrical & gynecological history	(n=60)	
	Frequency	Percent
No. of para:		
Nullipara	6	10.0
Para 1	4	6.0

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Para **2-3**	21	35.0	
Para **>3**		29	48.3
No. of abortion:			
None		23	38.3
One		12	20.0
Two		20	33.3
Three		5	8.3
Mode of delivery:			
None	6		10.0
Normal vaginal delivery	38		63.3
Cesarean section	1		1.7
Both of NVD & CS	15		25.0
Had ovarian cysts:			
Yes		16	26.7
No		44	73.3
Had uterine fibroids:			
Yes		5	8.3
No		55	91.7
Had Hysterectomy:			
Yes		36	60.0
No		24	40.0
Type of hysterectomy: n=36			
Partial		7	11.7
Total		1	1.7
Radical		11	18.3
Modified radical		17	28.3
Had ovariectomy:			
Yes		36	60.0
No		24	40.0
Fallopian tube excision:			
Yes		32	53.3
No		28	46.7
Excision of fallopian tube and ovary:			
Yes		33	55.0
No		27	45.0

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Table (4): Cervical cancer data of the studied elderly women (n=60)

Cervical data	(n=60)	
	Frequency	Percent
Duration of cervical cancer (months):		
3 -11	35	58.3
12 -18	25	41.7
Mean ± SD (range)	8.90 ± 4.22 (3 – 18)	
Current treatment regimen:		
Chemotherapy	60	100.0
Radiotherapy	30	50.0
Surgery	30	50.0
No. of chemotherapy doses before surgery:		
2- 7	48	80.0
8-12	6	10.0
No. of chemotherapy doses after surgery:		
2- 5	14	23.3
6-9	15	25.0
No. of radiotherapy session: n=30		
6 – 9 session	14	23.3
12 session	4	6.7
20-23 session	12	20.0

@responses are not mutually exclusive

Figure 2: Stage of cervical cancer

second stage   third stage

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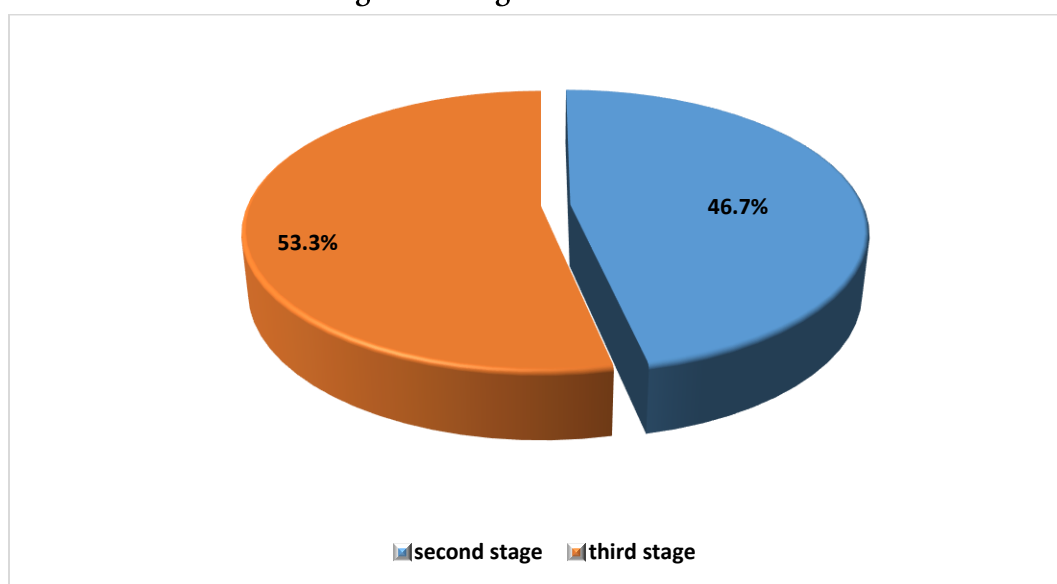
Table (5): Total knowledge among studied elderly women throughout the study phases n=60.

Knowledge items	Pre (n=60)		Post (n=60)		χ2	(p-value)
	No	%	No	%		
Knowledge of cervical cancer Satisfactory Knowledge Unsatisfactory Knowledge	9 51	15.0 85.0	35 25	58.3 41.7	49.02	<0.001**
Knowledge of palliative care Satisfactory Knowledge Unsatisfactory Knowledge	25 35	41.7 58.3	47 13	78.3 21.7	29.03	<0.001**
Total Knowledge Satisfactory Knowledge Unsatisfactory Knowledge	23 37	38.3 61.7	43 17	71.7 28.3	35.03	<0.001**

*: Statistically significant**: Highly statistically significant   Total Knowledge score 60%+. Total knowledge score 40

Table (6): Quality of life among cervical cancer elderly women' pre –post the program n=60.

Items	Pre (n=60)		Post (n=60)		(p-value)#
	No.	%	No.	%	
Functional scale					
Sexual functioning High Low	17 43	28.3 71.7	19 41	31.7 68.3	.500
Body image High Low	42 18	70.0 30.0	58 2	96.7 3.3	<0.001**
Sexual Activity High Low	11 49	18.3 81.7	19 41	31.7 68.3	<0.001**
Sexual Enjoyment High Low	13 47	21.7 78.3	16 44	26.7 73.3	.250
Total functional scale					
High Low	14 46	23.3 76.7	23 37	38.3 61.7	< 0.05*

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Symptom scale					
Symptom Experience					-
Low	0	0.0	0	0.0	
High	60	100.0	60	100.0	
Lymphedema					< 0.001**
Low	19	31.7	4	6.7	
High	41	68.3	56	93.3	
Peripheral Neuropathy					< 0.001**
Low	41	68.3	20	33.3	
High	19	31.7	40	66.7	
Menopausal Symptoms					< 0.05*
Low	16	26.7	6	10.0	
High	44	73.3	54	90.0	
Sexual Worry					< 0.001**
Low	18	30.0	0	0.0	
High	42	70.0	60	100.0	
Total symptom scale					
Low	35	58.3	49	81.7	< 0.001**
High	25	41.7	11	18.3	

*#:MacNemar test NS: Non significant   *: Significant   **: Highly significant   (--) Test result not valid*

Figure (3): Total cervical cancer quality of life throughout the study stage
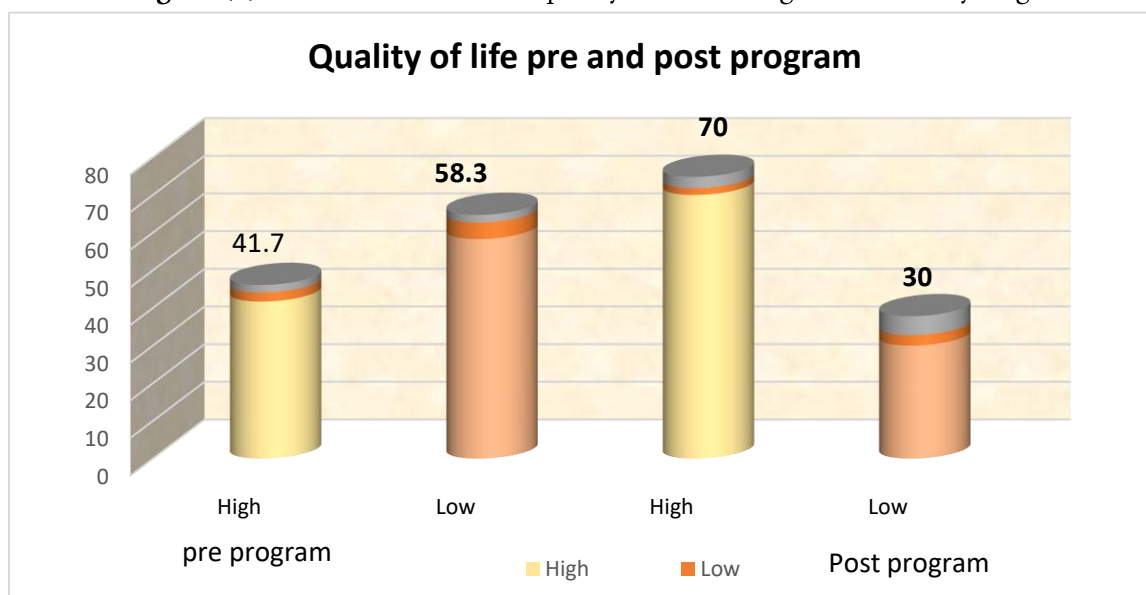

Quality of life pre and post program

Table (7): Relation between total knowledge regarding cervical cancer, palliative care of the studied
participants and their characteristics and cervical cancer data through the study phases n=60.

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Characteristics		Total knowledge		Mann Whitney Test	P
		Mean	SD		
Age group (years)	60– 67	23.36	4.34	.000	.993
	68 – 73	23.37	3.83		
Age at marriage:	13-20	23.71	4.06	1.88	.175
	21-30	21.82	4.53		
Marital status:	Married	23.70	4.23	1.41	.240
	Widower/divorced	22.15	3.89		
Education	Illiterate	24.23	3.63	H=15.313	.009*
	Read and write	23.36	3.75		
	Primary	23.33	4.22		
	Preparatory	23.80	3.55		
	Intermediate	22.00	3.88		
	University / postgraduate	22.50	3.07		
Women occupation:	Work	22.33	8.38	.746	.391
	Not work	23.47	3.95		
Residence	Rural	23.03	4.35	.472	.495
	Urban	23.78	3.98		
With whom you live	Alone	24.00	2.83	.821	.369
	With family	23.27	4.20		
Cervical cancer data					
Diagnosis of cancer date	3-11 month	23.54	4.40	.148	.702
	12-18	23.12	3.91		
Cancer stage	The second	23.35	3.96	.000	.987
	The third	23.37	4.41		

(H) Kruskal Wallis   (*) statistically significant at p≤0.05

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Table (8): Relation between characteristics and cervical cancer data of the studied participants and their total cancer quality post the program n=60.

Characteristics		Total cancer quality				$\chi 2$	P
		High (n=48)		Low (n=12)			
		No	%	No	%		
Age group (years)	60 – 67	36	81.8	8	18.2	.341	.559
	68 – 73	12	75.0	4	25.0		
Age at marriage:	13-20	39	79.6	10	20.4	Fisher	1.00
	21 -30	9	81.8	2	18.2		
Marital status:	Married	35	58.3	12	20	4.15	.042*
	Widower/divorced	13	21.7	0	0.0		
Residence	Rural	24	72.7	9	27.3	2.42	.119
	Urban	24	88.9	3	11.1		
Education	Illiterate	11	84.6	2	15.4		
	Read and write	8	72.7	3	27.3		
	Primary	5	83.3	1	16.7	4.79	.441
	Preparatory	10	100.0	0	0.0		
	Secondary	9	75.0	3	25.0		
	University/post	5	62.5	3	37.5		
Women occupation:	Work	3	100.0	0	0.0	.789	.374
	Not work	45	78.9	12	21.1		
With whom you live	Alone	2	100.0	0	0.0	Fisher	1.00
	With family	46	79.3	12	20.7		
Cervical cancer data							
Diagnosis of cancer date	3-11 month	26	74.3	9	25.7	1.71	.190
	12 -18	22	88.0	3	12.0		
Cancer stage	The second	24	85.7	4	14.3	1.07	.301
	The third	24	75.0	8	25.0		
Treatment with radiotherapy	Yes	22	73.3	8	26.7	1.67	.197
	No	26	86.7	4	13.3		
Treatment with surgery	Yes	26	86.7	4	13.3	1.67	.197
	No	22	73.3	8	26.7		

(*) statistically significant at p≤0.05

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Table (9): Correlation matrix of participants' knowledge and cancer quality of life [Functional quality of life& Symptoms experience].

Scores	Total mean score		
	Knowledge	Functional quality of life	Symptoms experience
Knowledge			
Functional quality of life	.026		
Symptoms experience	-.250*	-.471**	
Palliative care quality of life	.196	-.025	.032
Symptoms requiring palliative	-.398**	.046	.043

R: Pearson's correlation coefficient   (*) statistically significant at   p<0.05   (**) statistically significant at p<0.01

Table (10): Correlation matrix of participants' knowledge and cervical cancer quality of life, palliative care quality of life, symptoms requiring palliative care and their characteristics

Scores	Spearman's rank correlation coefficient		
	Knowledge	Functional quality of life	Symptoms experience
Age	-.264*	.088	.091
Educational level	.583**	.098	-.077
Marital status	-.120	.331**	.249
Residence [urban]	.305*	-.093	-.082

(*) statistically significant at p<0.05   (**) statistically significant at p<0.01

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Table (11): Best fitting multiple linear regression model for knowledge
score.

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	36.498	6.356		5.743	.000	23.750	49.246
Age	-.002	.091	-.003	-.025	.980	-.185	.180
Educational level	.560	.127	.540	4.396	.000	.304	.815
Income	-.023	.278	-.010	-.081	.935	-.581	.536
Function	-.254	1.001	-.030	-.253	.801	-2.263	1.755
Residence	.424	.459	.116	.924	.360	-.496	1.345
With whom you live	-.270	1.153	-.027	-.234	.816	-2.582	2.043

R-square=0.36 Model ANOVA F=4.87 p<0.001

Table (12): Best fitting multiple linear regression model for cervical cancer quality of life score.

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	2.907	1.925		1.510	.137	-.959	6.772
Age	-.024	.021	-.148	-1.152	.255	-.067	.018
Educational level	-.017	.034	-.075	-.497	.621	-.086	.052
Marital status	.047	.071	.098	.668	.507	-.095	.190
Diagnosis date	.057	.115	.070	.494	.624	-.174	.287
Uterine cancer level	-.050	.111	-.062	-.449	.655	-.272	.173
Total knowledge score	-.018	.034	-.081	-.523	.603	-.086	.051
Total functional score	.307	.117	.373	2.626	.011	.072	.541
Total symptoms score	-.365	.150	-.353	-2.437	.018	-.064	-.665

R-square=0.29 Model ANOVA F=2.65 p<0.05

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