Impact of an endometrial cancer prevention program based on health belief model on elderly women's awareness and quality of life

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Abstract---Endometrial cancer is the most common type of gynecologic cancer worldwide affecting elderly women. This study aims to evaluate the impact of an endometrial cancer prevention program based on health belief (HBM-based) model on elderly women's awareness and quality of life. Design: A Quasi-experimental pre- post nonequivalent control group design was utilized. Sample: A purposive sample of 60 elderly women with postmenopausal bleeding and not diagnosed with endometrial cancer. Setting: the study was conducted at El-Galaa' teaching hospital, and El kasr El Ainy teaching hospital outpatient clinics. Study tools: 1- A structured demographic data and medical history questionnaire, 2-An endometrial cancer prevention awareness questionnaire (beliefs, knowledge& practices), 3-(WHOQOL-BREF) questionnaire to assess elderly women's QOL. Results: the mean age of elderly was 65.87±3. 15. All elderly women had unsatisfactory knowledge and practice level related to endometrial cancer prevention during pretest evaluation which was improved to satisfactory in the study group after program implementation, a highly statistically significant difference between total beliefs (perceived severity, perceived susceptibility, perceived barriers, perceived benefits, cues to action) and the total QOL mean score of elderly women in the study group in the pre, post, follow up test (P= 0.00). Conclusion: Elderly women knowledge, awareness, beliefs and QOL

improved after implementation of the HBM-based prevention program than the results of the pretest. Recommendation: plan and implement educational programs to increase awareness of women about endometrial cancer prevention.

Keywords---Elderly women, endometrial cancer, health belief model.

Introduction

Endometrial cancer (EC) is the most frequent female reproductive tract cancer, as well as the fourth and sixth leading causes of cancer and cancer death among women in the United States. The average age upon diagnosis is 61 years. The current increase in incidence is likely to be linked to both increased life expectancy and rising obesity rates; EC is typically diagnosed in postmenopausal women(1). The majority of women with EC (67%) are diagnosed at an early stage with uterine cancer. Approximately 21% will have regional spread to pelvic lymph nodes and nearby organs (e.g., adnexal tissues), with the remaining 8% having distant metastases. Ninety percent of endometrial cancer patients experience abnormal vaginal bleeding, most typically postmenopausal, and bleeding occurs early during the malignancy(2).

In 2017, an estimated 61,380 new cases of uterine cancer were detected, with 10,920 deaths. The endometrium is the site of the majority of uterine cancers (92%) (3). More than 90% of postmenopausal women with endometrial cancer manifest with vaginal bleeding; postmenopausal vaginal hemorrhage is mainly caused by atrophic alterations in the vagina or endometrium. Endometrial cancer affects 1–14 percent of postmenopausal women, depending on age and risk factors(4).

Many studies suggest that exposure to certain environmental risk factors or lifestyle changes may modify the characteristics of this cancer. Age, BMI, race, familial history, polycystic ovary, diet, physical activity, smoking, parity, breastfeeding, birth rate, hormone-replacement therapy, hypertension, diabetes, socioeconomic status, and exposure to infertility treatment are the most important risk factors for endometrial cancer (5). Women in underdeveloped countries are more prone to endometrial cancer due to a lack of understanding of known signs like abnormal vaginal bleeding , pelvic lump , changed bowel habits, difficulty in urination, pain during sexual intercourse (6), a late diagnosis at a higher-grade stage of the disease, a lower quality of life, and a lower socioeconomic level(7).

The Health Belief Model (HBM) structure has been utilized in research for its preventative properties in the occurrence of certain disorders. As a result of the findings, this study was conducted to increase elderly women's awareness, and quality of life regarding endometrial cancer, which will result in preventative behavior(8).

HBM based education is an effective method for increasing elderly women's knowledge and subsequent behavioral change in this prevention program. Using

this model, which is based on six constituent constructs (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, perceived threat , cues to action), one can lead elderly women to the belief that they are susceptible to disease and should therefore engage in risk-reducing behaviors(9).

Significance of the study

According to a study done by Alshahrani et al., (2018),endometrial cancer incidence rate is increasing over time in the Gharbiah province of Egypt compared to other countries, the postmenopausal Egyptian women comprised the fast majority of endometrial cancer as in other countries and recommended that future studies should focus on indicating the impact of epidemiologic, demographic, and nutritional factors on the future of endometrial cancer in this population and explore if the increasing environmental pollution and environmental estrogens may have an impact on regional distribution of the disease in rural and urban regions of this population .

Another study assessed the relation between different measures of obesity and the risk to develop endometrial cancer in Egyptian females with postmenopausal bleeding (PMB). The study was conducted in Alexandria, Egypt and included all postmenopausal females presenting to the University Hospital of Gynecology and Obstetrics with PMB within the study period stated that endometrial cancer was diagnosed in 38% of females presenting with PMB and that the risk of abdominal obesity on endometrial cancer remains very high (OR = 15.8, 95%CI 4.1–60.9) even after adjustment, in a logistic model, for other risk factors such as age at presentation, age at menarche, age at menopause, family history of malignancy, and gravidity. Abdominal obesity (waist circumference >88 cm) is the best measure of obesity to be used in predicting the risk of endometrial cancer in Egyptian females with PMB (11)

Since women's health is considered a basis for the health of the population, families, and society, as well as a development indicator in countries(12). Elderly Women are in need for more attention and care to have a good quality of life and to minimize the social and financial burden on patients, families, and the community. So, investigating the level of awareness (perceived knowledge, practices and beliefs) of elderly women about endometrial cancer warning signs can play an important role in disease prevention at the community level (13).

Gerontological nurses play a significant role in the primary prevention through health education and promotion of elderly women regarding EC prevention. Gerontological nurses role in the secondary level prevention is also crucial through screening, early detection and early nursing care of the disease (14). Moreover, gerontological nurse has a vital role of delivering correct information to older women and careers about risk factors, identifying early indicators of uterine cancer, encouraging females to undergo uterine cancer screening often and about preventative measures for uterine cancer(15). Carrying out this research will help spot the light on this significant silent health problem in Egypt. Moreover, conducting this research will add to the nursing body of knowledge by identification of risk factors for endometrial cancer among elderly women, increase awareness about the problem and evaluating the effect of preventive of

endometrial cancer. Thus, the following study may help in prevention of endometrial cancer and improving elderly women's quality of life

Operational definition of elderly women's awareness: It refers to elderly women's knowledge, beliefs and practices scores about prevalence, symptoms, risk factors, diagnosis, and prevention of endometrial cancer.
Aim of the study: The current study aims to evaluate the impact of an endometrial cancer prevention program based on health belief model on elderly women's awareness and QOL
Research hypotheses: H1- Elderly women who will be exposed (study group) to Endometrial Cancer Prevention Program Based on Health Belief Model will exhibit higher awareness total mean score than those who will not be exposed (control group) to the educational intervention.
H2- Elderly women who will be exposed (study group) to Endometrial Cancer Prevention Program Based on Health Belief Model will exhibit higher quality of life total mean score than those who will not be exposed (control group) to the educational intervention.

Methods

Research design
Quasi-experimental pre- post nonequivalent control group design was utilized to fulfill the aim of the study.

Setting

The current study was conducted at El-Galaa' teaching hospital, Cairo, Egypt in addition to El kasr El Ainy teaching hospital outpatient clinics. Sample: Purposive sample of sixty older women with postmenopausal hemorrhage who attended an outpatient clinic were randomly assigned to one of two groups (control or study). It was collected over a six-month period. The intervention group received HBM-based prevention program, whereas the control group received standard outpatient care at the hospital.

Tools for data collection

The researchers developed three tools for data collection: **1-** Demographic data, and medical history questionnaire. It includes information such age, educational level, occupation, educational level, past medical history (family history of cervical cancer, age at marriage, duration of marriage, personal habits (diet, exercise, stress management, caffeine, etc. 2- Elderly women's awareness of endometrial cancer prevention questionnaire. It was developed by researchers and is divided into three parts: Part 1: Assessment of elderly women's beliefs regarding endometrial cancer prevention based on the HBM scale it consists of 39 questions (seven for perceived susceptibility, 11 items for perceived severity, 5 items for perceived benefits, 9 items for perceived barrier, and 7 items for cues to action). Part 2 included two sections; section one: included nine questions to assess elderly women's reported practices regarding endometrial cancer prevention, section two; an observational checklist of elderly women's practices about range of motion exercise (10 items), breathing exercise (12 items) and KEGEL exercise

(11 items). The total score of practice ranged from 0 to 42 points, and it was considered 'poor 'if the practices scored from 0 to 25, 'average' from 26 to 39, and 'good' from 40 to 42 points. Part 3 Assessment of elderly women's knowledge regarding endometrial cancer prevention questionnaire, it involved 30 questions. The total score of knowledge ranged from 0 to 30 points, and it was considered 'poor 'if the knowledge scored from 0 to 15, 'average' from 16 to 23, and 'good' from 24 to 30 points. The total scoring system for the second total ranged from 0 to 111 points, and it was considered' poor 'if the score from 0 to 66, 'average' from 67 to 90, and 'good' from 91 to 111 points. 3- World Health Organization Quality of Life Questionnaire (WHOQOL-BREF): it contains 26 questions: covering all domains of health., domain scores of the WHOQOL-BREF calculated by taking mean of all items in each domain and multiply in 4 then transformed to a 0 - 100% scale

Content validity and reliability

content validity was done to the study tools; experts were asked to link each objective to its item to assess relevancy of the item to the content addressed by objectives and relevancy of content. Then, the researchers employed the alpha coefficient as the index of content validity. The resulting alpha coefficient quantified the extent to which there was agreement between the experts' rating items. A coefficient of 0.00 indicated lack of agreement between the experts and a coefficient of 1.00 indicated complete agreement and the result of the current study was 90 %, r = 0.9. Cronbach alpha was used for internal consistency of the structured elderly women's socio-demographic and medical data questionnaire and awareness questionnaire, the reliability was (0.83 and 0.79) respectively. Domain scores produced by the WHOQOL-BREF had shown to correlate at around 0.9 with the WHOQOL-100 domain scores.

Protection of ethical and human rights

The Committee of Scientific Research Ethics of Cairo-Faculty University of Nursing approval number is RHDIRB2019041702. Furthermore, an official approval to perform the suggested study was received from Cairo University's Faculty of Nursing. After discussing the purpose of the study, the duration of the study, and the data collection process to the participants, written formal consents were obtained.

Procedure

Data collection lasts for 9 months starting from February 2021 till October 2021. The study was carried out in the following phases: assessment, planning, implementation, and evaluation.**1-Assessment phase**: The researchers met elderly women and filled out the questionnaire to assess awareness regarding endometrial cancer prevention. The data obtained during this phase are considered the basis for evaluation of educational program (pretest) to evaluate the efficacy of the interventions. Assessment phase took 5 weeks; the researchers interviewed elderly women in a private room in the outpatient clinics two days/ week (almost Saturday and Thursday) from 9 am to 1pm. Due to the COVID-19 pandemic, researchers also contacted elderly women by telephone and using the

social network such as zoom or what's app to minimize face-to-face meetings as global precautions of COVID-19 infection. In the first session, researchers filled out the socio-demographic and medical history questionnaire in addition to elderly women's knowledge about endometrial cancer questionnaire, the second session included assessment of elderly women's beliefs and QOL regarding endometrial cancer prevention, third session included assessment of elderly women self-reported practices. Fourth session included observing elderly women performing breathing exercise; the fifth session included performing KEGEL exercise. **2-Planning and implementation phase**: After identifying the needs of women in the assessment phase, researchers developed the endometrial cancer prevention program content with simple Arabic language to be suitable for women's level outlines included knowledge and health beliefs about endometrial cancer prevention such as definition of uterine cancer, risk factors, causes, signs and symptoms, diagnosis, prevention, and vaccination (benefits, age for vaccination). This phase was concerned with the implementation of the HBM based prevention for endometrial cancer. it included six sessions: the first session include discussion about the importance of the HBM based prevention for endometrial cancer and planned goals to be achieved from the participant in the program and outline of session's content to ensure mutual understanding, cooperation, and its correct implementation. The second , session includes individualized lecture about endometrial cancer (definition, causes, risk factors, signs and symptoms, complication , preventive measures), the third session included demonstration and re-demonstration about performance of range of motion exercise, fourth session included demonstration and re-demonstration about performance of breathing exercise, fifth session included demonstration and re-demonstration about performance of KEGEL exercise and the last session in this phase included discussion about QOL related to endometrial cancer. At the end of each session, researchers summarized the important point, allowed the participant to ask questions and answered it. Teaching aids included videos about KEGEL exercise, range of motion, and deep breathing exercise to help elderly women in performing the preventive practices, posters, and colored booklet. The booklet included comprehensive knowledge about endometrial cancer (definition, causes, risk factors, signs and symptoms, complications.,.etc.). Teaching methods used were discussions, role play and demonstration and re-demonstration also these videos were sent by What's App or by social network either to the elderly women or one of her caregivers, adding to that each elderly women or caregivers received a copy of the booklet of the guidelines individually.**3-Evaluation phase:** After implementation of a HBM based prevention for endometrial cancer, its effect was assessed by posttest evaluation. The evaluation done immediately one time after the program using the same tools of pretest evaluation also, three months later follow up evaluation was done from the implementation of the HBM based prevention for endometrial cancer, consolidation of the program was done through planned interviews and by telephone to assess to which extent the study subjects remember the knowledge and apply the prevention practices. The researchers provided feedback and support to elderly women so that change remains in place.

Results

Table (1)

Percentage distribution of the studied elderly women personal data and medical history (N=60).

Personal data	Categories	Control group (n=30)		Study group (n=30)		Chi square test	
		No.	%	No.	%	x2	P
Age group	60< 65 years	11	36.7	12	40.0	2.48	.98
	65< 70 years	15	50.0	16	53.3		
	≥ 70 years	4	13.3	2	6.7		
	Mean ±SD	65.87±3.15		65.40±2.80			
Marital status	Married	12	40	14	46.7	.27	.87
	Divorced	8	26.7	7	23.3		
	Widowed	10	33.3	9	30		
Educational level	do not read or write	13	43.3	14	46.7	.15	.99
	primary education	9	30	9	30		
	intermediate education	5	16.7	4	13.3		
	University	3	10	3	10		

According to Table 1, around 50 % of elderly women in the control group aged 65-70 years, furthermore 53.3 % in the study group aged 65- 70 years, with a mean of 65.87±3.15 years in the control group and 65.40±2.80 years in the study group. In terms of marital status, 40% of elderly women in the control group were married and 33.3 % were widowed, whereas 46.7 % of those in the study group were married and 30% were widowed. Regarding to educational level, 43.3 % of elderly women in the control group and 46.7 % of elderly women did not read or write.

Figure (1): Percentage distribution of elderly women regarding health problems and chronic diseases (N=60).
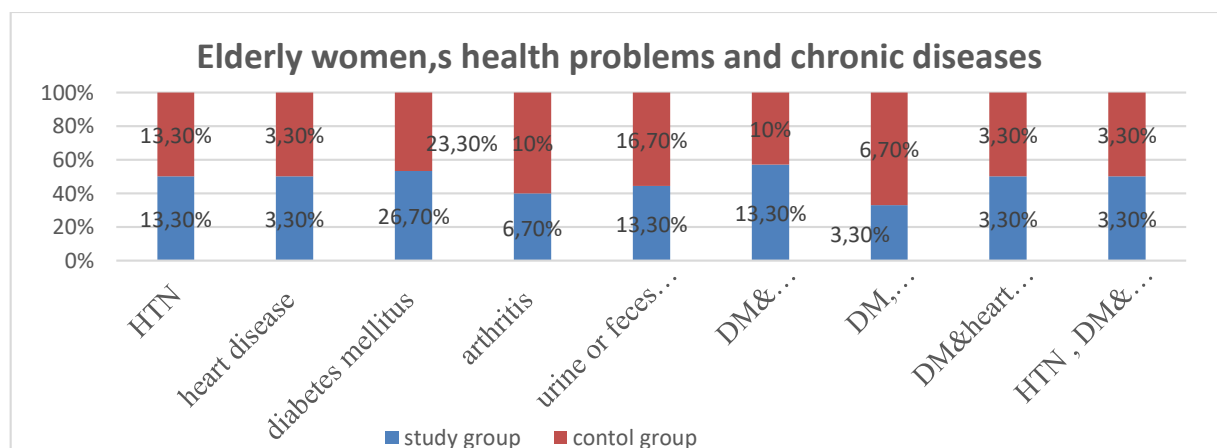

Table (1) shows that, concerning health problems in the control group, 23.3 % complained of diabetes mellitus, 16.7 % complained of urinary or fecal

incontinence, and 13.3 % complained of hypertension, whereas (26.7 %, 13.3 %, 13.3 %) complained of the same health problems respectively in the study group.
Figure (2): Percentage distribution of elderly women regarding body mass index (N=60).
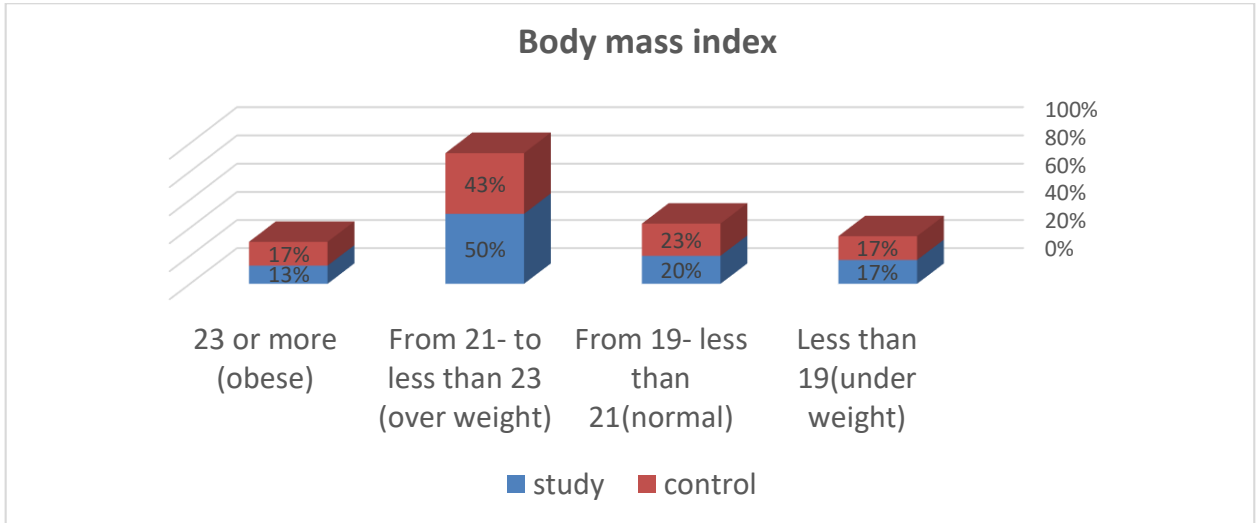

Body mass index

Table (2) shows that, concerning BMI in the control group, 43 % were from 21 to less than 23 compared to 50 % in the study group that is considered overweight.
Figure (3): Percentage distribution of elderly women regarding health status (N=60).

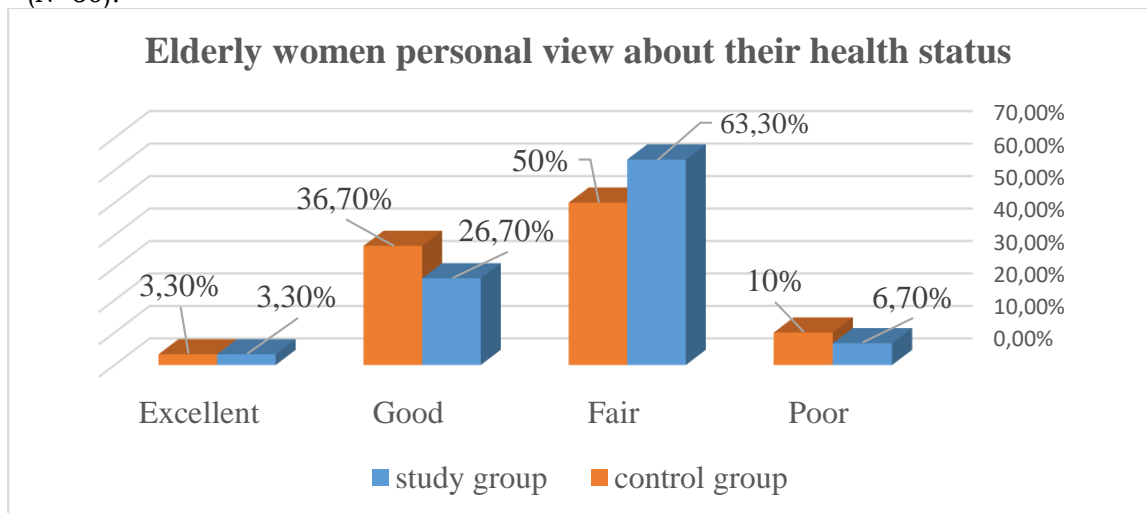**Elderly women personal view about their health status**

Figure (3) shows that 50 % in the control group and 63.3 % in the study group viewed their health status as fair, whereas 36.7 % in the control group and 26.7 % in the study group viewed their health status as good, with no statistically significant differences in health status between the study and control groups.
Figure (4): Frequency distribution of elderly women total level of beliefs according to health beliefs model in pretest, posttest and follow up (N=60)

Elderly women's total beliefs level

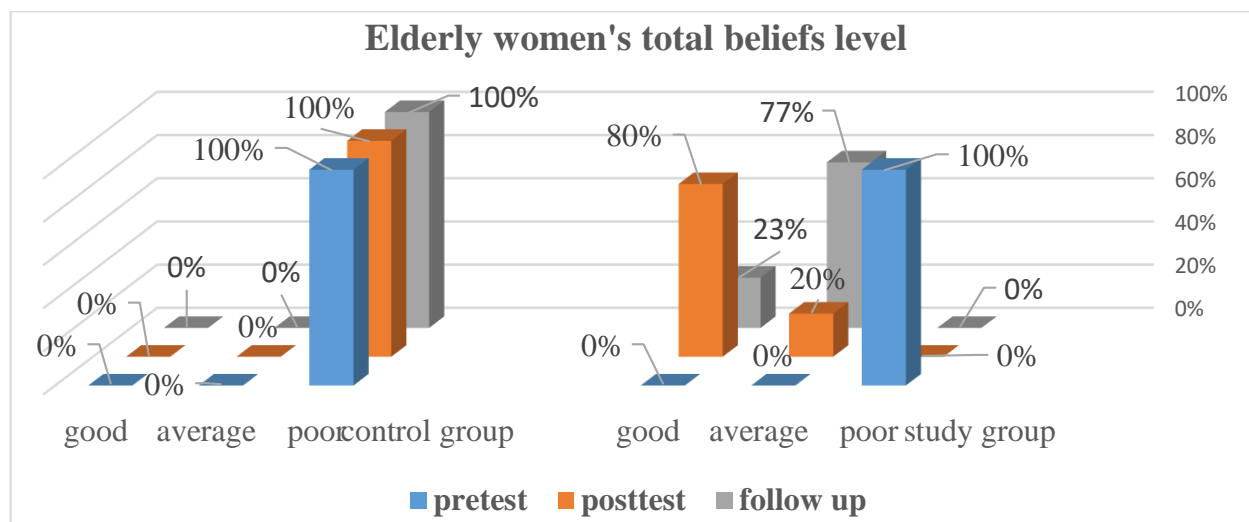**pretest** **posttest** **follow up**

Figure (4) indicates that all of the study participants had poor level of beliefs in the pre, post and follow up test in the control group and none of them had good level of beliefs while, 100%, 0% and 0% had poor level of beliefs in the pre, post and follow up test in the study group respectively compared to 0%, 80 % and 23.3 % that had good level of beliefs in pre, post and follow up test respectively.

Figure (5): Frequency distribution of elderly women total level of knowledge in pretest, posttest and follow up (N=60)

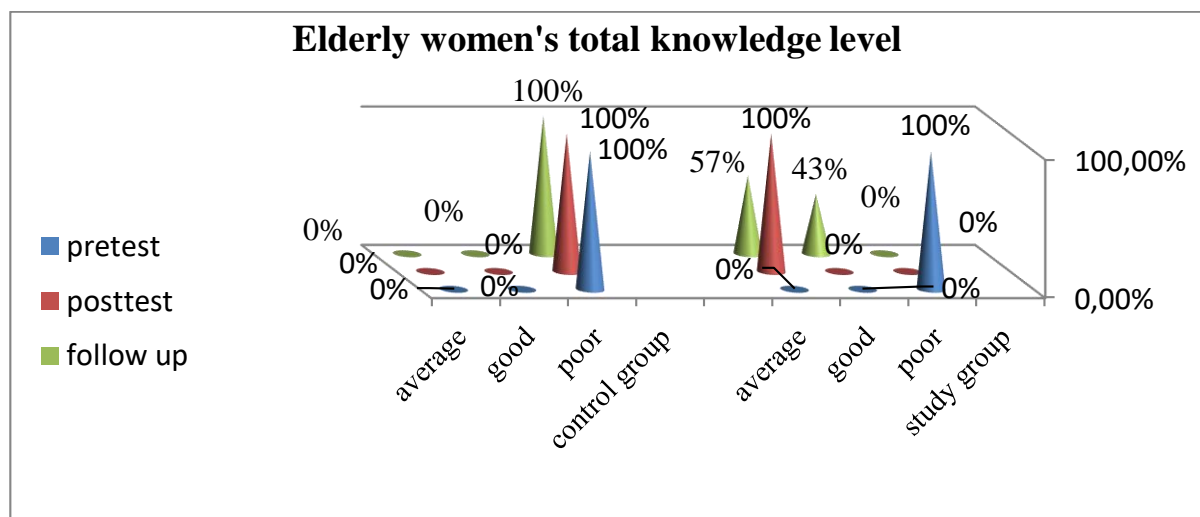## Elderly women's total knowledge level

Figure (5) indicates that all of the study participants had poor level of knowledge in the pre, post and follow up test in the control group while, 100%, 0% and 0% had poor level of knowledge in the pre, post and follow up test in the study group respectively compared to 0%, 100 % and 56.7 % that had good level of knowledge in pre, post and follow up test respectively.

Figure (6): frequency distribution of elderly women total level of practice in pretest, posttest and follow up (N=60)
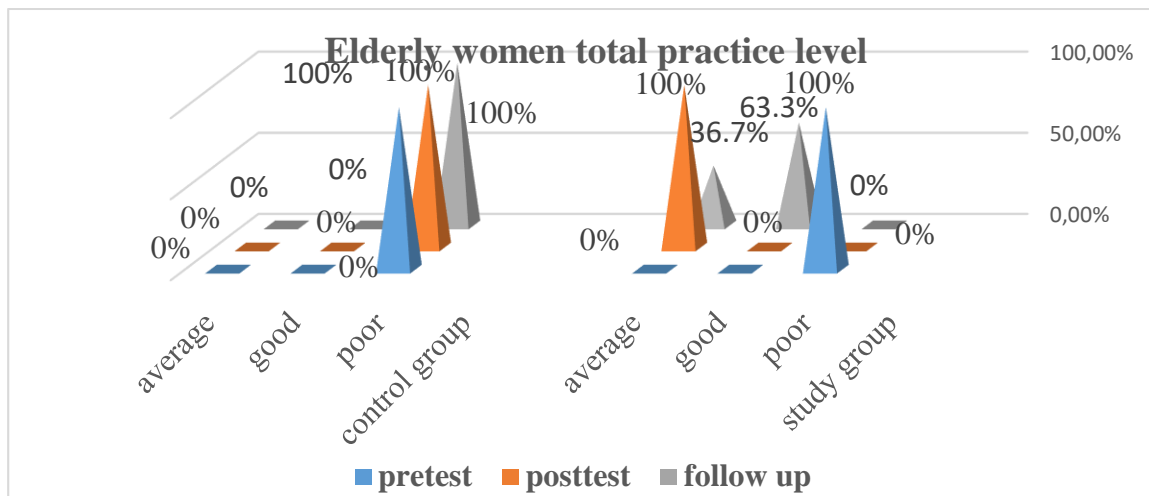
Elderly women total practice level

Figure (6) indicates that all the elderly women had poor level of practice in the pre, post and follow up test in the control group while, 100%, 0% and 0% had poor level of practice in the pre, post and follow up test in the study group respectively compared to 0%, 100 % and 36.7 % that had good level of practice in pre, post and follow up test respectively.

Figure (7): Frequency distribution of elderly women total level of awareness in pretest, posttest and follow up (N=60)

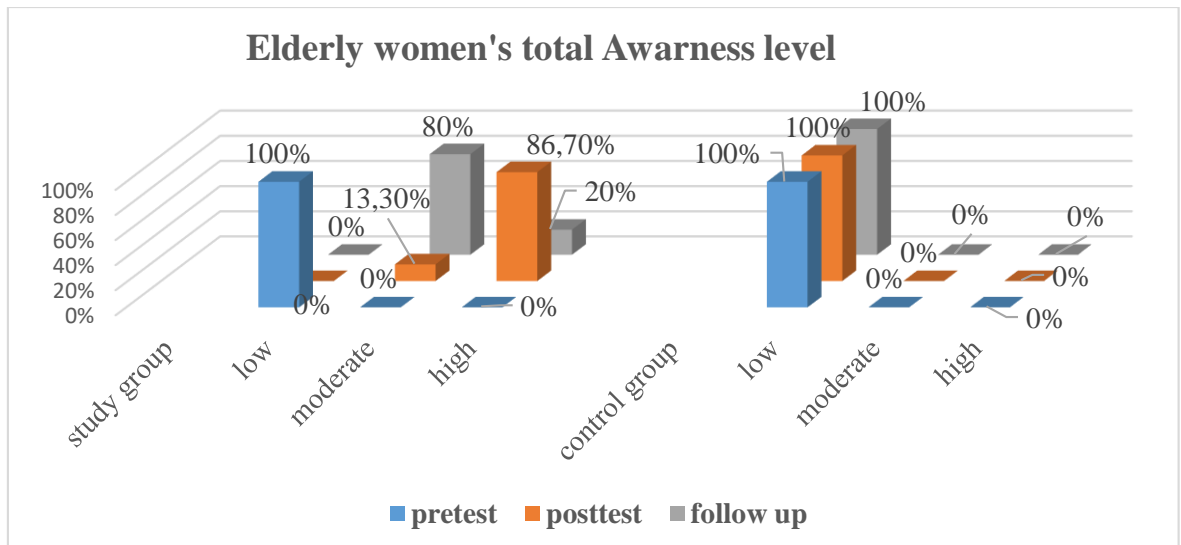**Elderly women's total Awarness level**

Figure (7) indicates that all the study participants had low level of awareness in the pre, post and follow up test and that 0%, 86.7% and 20% had high level of awareness in the control group while, 100%, 0% and 0% had low level of awareness in the pre, post and follow up test in the study group respectively compared to 0%, 86.7 % and 20 % that had good level of awareness in pre, post and follow up test respectively

Figure (8): Frequency distribution of elderly women total level of QOL in pretest, posttest and follow up (N=60)
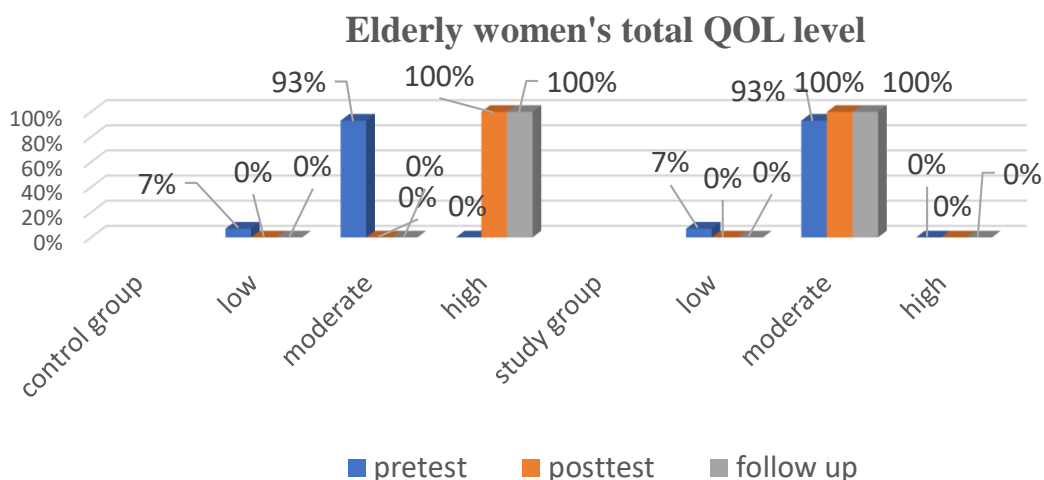

Figure (8) indicates that 6.7%, 0 % and 0% of elderly women had low level of QOL in the pre, post and follow up test respectively and that 0 %, 100 % and 100 % had high level of QOL and 93 %, 0 % , 0 % had moderate level of QOL the pre, post and follow up test respectively in the control group while, 6.7%, 0% and 0% had low level of QOL in the pre, post and follow up test in the study group respectively compared to 93.3%, 100 % and 100 % that had moderate level of QOL in pre, post and follow up test respectively

Table (2)
Difference between total Belief's subscale mean score across the program phases (pretest, posttest and follow up) in the study and control group (N=60)

Mean ±SD	Total Beliefs subscale mean score									
	Study group(n=30)					Control group (n=30)				
	Pre Test	Post Test	Follow up	Repeated measures ANOVA		Pre Test	Post test	Follow up	Repeated measures ANOVA	
				F	P				F	P
Health Belief perceived severity	1.73 ± 1.28	9.37± 1.03	7.40 ± 1.22	335.95	.00	1.67± 1.24	2.37± 1.52	2.17± 1.29	2.123	0.126
Health Belief perceived susceptibility	1.00 ± 1.02	5.57± 1.36	5.23 ± 1.19	135.62	.00	1.00± 1.02	1.47± 1.11	1.20± 1.13	1.399	0.252
Health Belief perceived barriers	1.43 ± 0.97	7.53 ± 1.04	6.80 ± 1.45	241.98	.00	1.43± 0.97	2.00± 1.08	1.90± 1.12	2.435	0.094
Health Belief perceived benefits	0.37 ± 0.49	4.53 ± 0.57	3.87± 0.68	437.26	.00	0.37± 0.49	0.77± 0.82	0.57± 0.50	3.098	0.050
Health belief cues to action	0.53 ± 0.63	4.47 ± 0.51	4.17± 0.79	337.24	.00	0.53± 0.63	0.77± 0.77	0.80± 0.71	1.263	0.288

Table (2) illustrates that, a highly statistically significant difference was found between total belief (perceived severity, perceived susceptibility, perceived barriers, perceived benefits, cues to action) mean score of elderly women in the study group in the pre, post, follow up test (P= 0.00) whereas a statistically

significant difference was found between total health belief perceived benefits mean score of elderly women in the control group in the pre, post, follow up test (P= 0.050).

Table (3)
Difference between total study variables across the program phases (pretest, posttest and follow up) in the study and control group (N=60)

	Study group (n=30)					Control group (n=30)				
	Pre Test Mean ±SD	Post Test Mean ±SD	Follow up Mean ±SD	Repeated measures ANOVA		Pre Test Mean ±SD	Post test Mean ±SD	Follow up Mean ±SD	Repeated measures ANOVA	
				F	P				F	P
Total Beliefs mean score	5.07 ± 2.21	31.47± 2.78	27.47± 2.91	865.1	.00	5.00 ± 2.21	7.37 ± 2.81	6.63 ± 2.51	6.916	0.002
Total practice mean score	0.80 ± 0.89	37.43± 1.83	31.90 ± 3.25	2384.41	.00	0.80 ± 0.89	1.27 ± 1.14	1.00 ± 1.14	1.450	0.240
Total knowledge mean score	2.60 ± 1.89	27.43± 1.74	24.50 ± 3.28	957.31	.00	2.60 ± 1.89	3.80 ± 2.50	3.80 ± 2.70	2.532	0.085
Total QOL mean score	48.53 ± 2.30	55.70 ± 4.85	52.90 ± 4.18	25.36	.00	48.53 ± 2.30	49.33± 2.68	49.63 ± 2.86	1.409	0.250

Table (3) illustrates that, a highly statistical significant difference was found between total belief, practice, knowledge and QOL mean score of elderly women in the study group in the pre, post, follow up test (P= 0.00) whereas a highly statistical significant difference was found only between total beliefs mean score of elderly women in the control group in the pre, post, follow up test (P= 0.002) furthermore, no statistical difference found between elderly women practice, knowledge and QOL mean score in the control group in the pre, post and follow up test (P= 0.240 , 0.085 and 0.250) respectively

Table (4)
Difference between total mean scores of study variables in the pre and posttest in the study and control group (N=60)

	Pretest				Posttest			
	Study Group Mean ±SD	Control group Mean ±SD	Independent T test		Study group Mean ±SD	Control group Mean ±SD	Independent T test	
			T	P			T	P
Beliefs mean score	5.07±2.21	5.00±2.21	.12	.99	31.466±2.775	7.366±.2.809	33.42	.64
Practice mean score	0.80±0.89	0.80± 0.89	.00	1.00	37.433 ± 1.832	1.266±1.142	91.73	.002
Knowledge mean score	4.47±1.80	4.47±1.80	.00	1.00	27.433±1.735	3.800± 2.496	42.57	.02
QOL mean score	49.17 ±2.87	49.17 ±2.87	.00	1.00	55.700 ±4.85	49.333±2.682	6.29	.002

Table (4) illustrate that, no statistically significant difference was found between elderly women in the study and control group regarding total belief mean score in the pre and posttest respectively (P=.99) and (P=.64) but a highly statistically significant difference found between elderly women in the study and control group

regarding total practice, knowledge and QOL mean score in the posttest (P= 0.002, 0.02 and 0.002) respectively.

Discussion

Endometrial cancer is a significant health problem so awareness of its causes, and implementation of the screening program can help in reducing the risk of disease and death among elderly women. Also, they help to decrease disease burden on health care services. Moreover, the use of early detection, and in advanced clinical testing, has been proven to be effective in preventing the dangerous consequences of this type of cancer thus put a heavy burden on the geriatric nurse in providing a valid information to elderly women and care givers about risk factors, discovering early signs of uterine cancer, encouraging females to undergo uterine cancer screening frequently and about preventive measures for uterine cancer that is reflected in women response rate in acceptance to participate in the current study and the improvement in their knowledge, beliefs and compliance to recommended practices in the post and follow up test than the pretest. Therefore, early detection and prevention program should be essential part of routine care provided to elderly women.

The current study revealed that about one half of the studied elderly women aged from sixty-five to less than seventy years, moreover more than one third of them were married whereas, less than one half of elderly women were illiterate furthermore about one half of them viewed their health status as fair. These findings are in agreement with a similar study carried out by Luo, et al. (2014) to assess the relationships among diabetes, diabetes treatment and endometrial cancer risk in Postmenopausal women participating in the Women's Health Initiative (WHI) in USA.

Concerning BMI the results of the current study revealed that , less than half of the studied elderly women were overweighed that constitute a major risk factor for endometrial cancer that necessitate the need for weight reduction programs and require the cooperation of all the health care providers to apply and educate the public about the importance of such programs. This results of Haggerty, 2016 who study the feasibility of two technology-based weight loss interventions in elderly population in USA and found that more than one third of the study participants were over weighted

The current study revealed that, no statistically significant difference was found between elderly women in the study and control group regarding total belief mean score based on (HBM) items in the pre and posttest**.** These results can be explained by the fact that changing beliefs and behavior is a very difficult process and need a lot of time and continuous education and refreshing programs. this results completely inconsistent with the findings of Shobeiri et al., (2016) on 330 women in Hamadan, Iran who assess knowledge and behavior regarding the Pap smear test based on the Health Belief Model (HBM) in women and found that, there was no significant difference between the mean scores of the various structures of this model in two groups before the intervention(16). However, after the intervention there were significant increase in mean score of knowledge and all variables of HBM in the intervention group (<0.001). From current researchers'

point of view, these findings can be related to sociocultural difference between participants of the two studies.

On the other hand, Malmir, et al., (2018) conducted a study on 143 women in Kermanshah, Iran to determine the effectiveness of an educational intervention to prevent cervical and gynecological cancer among marginalized Iranian women based on the Protection Motivation Theory (PMT) and found that, the mean perceived vulnerability and severity scores of the experimental group showed a significant increase after the educational intervention, compared to that of the control group(17). This elevation revealed the effectiveness of the executed educational program. From current researchers' point of view, the difference between the findings of the two studies related to difference in educational level and socioeconomically status as almost of the studied elderly women were of low educational level in addition to lack of knowledge about the disease that impact their everyday practices.

Regarding perceived severity, the results of the current study showed that there was a highly statistically significant difference that was found between total belief perceived severity mean score of elderly women in the study group in the pre, post, follow up test (P= 0.00) whereas a statistically significant difference was found between total health belief perceived benefits mean score of elderly women in the control group in the pre, post, follow up test (P= 0.050). This finding to some degree matched with the results of the study done by Sharifikia, et al., 2018 on 160 participants in Bushehr, Iran who investigated the effect of Health Belief Model (HBM)-based educational intervention on the knowledge and perceived beliefs of women about the warning signs of cancer and also found that a highly statistically significant difference was found between total belief subscale items (Perceived sensitivity , Perceived severity, Perceived benefits, Perceived barriers, self-efficacy, Perceived cues to action)(17). From current researchers' point of view, beliefs are an integral part of individuals life that can't be changed easily and need more knowledge, attention, and awareness about the presence of risk factors for endometrial cancer to be changed.

Concerning knowledge about causes and risk factors of endometrial cancer, the results of the current study showed that only minority of the elderly women in the study and control group know the causes and risk factors of the disease (obesity, DM, HTN, early menarche, late menopause, smoking) in the pretest. These findings may be related to lack of awareness of elderly women about the disease and its causes and this may be related to low educational level of the studied women. These results were improved after implementation of the program as majority of the studied women know the causes and risk factors of the disease in the post and follow up test. This result to some degree matched with the results of Ali-Risasi, et., al, (2014) who studied 524 women in Kinshasa, Congo to estimate Knowledge, attitude, and practice (KAP) on cervical cancer and gynecological cancer and to identify associated factors and revealed that less than one quarter of the studied women had correct knowledge about causes and risk factors of gynecological cancer (18). From current researchers' point of view, lack of elderly women knowledge may be due to lack of access to education programs and health teaching and loss of interest of them toward these programs because of poor knowledge about its importance and benefits.

Sharifikia, et al., 2019 also revealed that there was a highly statistically significant difference was found between total knowledge mean score of elderly women in the study group in the pre, posttest (P= 0.001) whereas no statistically significant difference was found between total knowledge mean score of elderly women in the control group in the pre, posttest (P= 0.134) and these results completely agree with the findings of our study that found a highly statistically significant difference was found between total knowledge mean score of elderly women in the study group in the pre, post, and follow up test (P= 0.00) whereas no statistically significant difference was found between total knowledge mean score of elderly women in the control group in the pre, post and follow up test (P= 0.0845)(18). These results may be related to the effect of the educational program in changing knowledge of the studied women about endometrial cancer prevention and early signs of endometrial cancer in the study group than in the control group.

In relation to knowledge about signs and symptoms of endometrial cancer, the results of the current study revealed that only minority of elderly women in the study and control group know the correct signs and symptoms of the disease (pain around the stomach, painful defecation, yellow smelly, painless discharge from vagina, frequent urination, pain during sexual intercourse) in the pretest. So more emphasize on endometrial cancer prevention program should be targeted to elderly women in Egypt due to more vulnerability of these group (increase age, high prevalence, comorbidity). These results were improved after implementation of the program as majority of the studied women know the correct signs and symptoms of the disease in the post and follow up test. This result contradicts the results of Bekar, et., al, (2013) on 497 women to determines the knowledge of the female course attendees of "Municipality Cultural Center for Women" located in city center of Sivas, Turkey and their attitudes regarding gynecological cancer prevention and showed that about more than two thirds know that pain around stomach is a symptoms of the disease, one third know about painful defecation, one half know about yellow, smelly discharge, one third know about frequent urination and two thirds know that pain during sexual intercourse is a symptom of the disease(6,19). From current researchers' point of view, these results may be related to similarities of signs and symptoms of endometrial cancer with other diseases and gynecological problems that make them unable to differentiate between them as they don't have the adequate knowledge as almost of the study participant were illiterate.

Regarding knowledge about endometrial cancer prevention, the results of the current study showed that only minority of elderly women in the study and control group know that stress management is important for preventing endometrial cancer in the pretest and more than one fifth reported that exercising regularly does not prevent endometrial cancer. These findings may be related to lack of knowledge of the Egyptian population about preventive measures and thus because of low educational level of elderly women. These results were improved after implementation of the program as majority of the studied women know the preventive measures of the disease in the post and follow up test. This result contradicts the results of Ahmad, (2015) on 3,196 participants to explore the knowledge and beliefs toward cancer in Jordan and found that less than two of the study participants know that managing stress and anxiety and following

healthy lifestyle decrease the risk of cancer(20). From current researchers' point of view, these findings may be related to the nature of fear of females exploring and discussing their health status with others that leading to ignore the presence of health risk and as a result not following the prevention measures.

Concerning reported practices for endometrial cancer prevention, the results of the current study revealed that majority of elderly women reported being overweight according to BMI, more than one fifth reported eating a healthy diet and only less than one fifth do regular exercise in the study in the pretest. These findings may be related to the habits and not following healthy lifestyle among the Egyptian population and thus may be related to low educational level and low socioeconomic standard as a result. These results were improved after implementation of the program as majority of the studied elderly women reported practicing exercise and take healthy diet and this increase in the percentage because of the prevention program. This result contradicts the results of Derbyshire, et., al, (2022) on 74 women in Manchester, UK to assess the willingness of women to engage with risk-reducing strategies and establish perceived barriers that may preclude their participation of primary endometrial cancer prevention and showed that less than two thirds of the study participants reported lose weight and eat more healthy and about one half of them perform more exercise for prevention of endometrial cancer(21). From current researchers' point of view, decrease family income, decrease materials and resources needed to practice self-care and healthy practices also with low income, there is a decrease in the opportunity to trust own capabilities to perform healthy practices and lifestyle for prevention of endometrial cancer so such programs must focus on weight reduction and healthier lifestyle especially among such vulnerable elderly women.

Regarding practice for endometrial cancer prevention, the results of the current study revealed that all elderly women in the study and control group did not practice (range of motion exercise, breathing exercise and relaxation techniques, kegel exercise) in the pretest. These findings may be related to lack of knowledge among the Egyptian population about the importance of exercise and healthy practices for prevention of disease secondary to low educational level. This results were improved after implementation of the program as majority of the studied women reported practicing exercise in the study group but the percentage of the control group still the same as pretest because they weren't expose to the prevention program These results go on the same line with the results of Körner, et., al, (2019) on 89 women in Canada to examine the efficacy of the nursing care intervention, delivered as a self-directed workbook, for enhancing empowerment, coping, and quality of life and reducing distress and concluded that the increase of empowerment (main outcome) and quality of life and the decrease of distress through using relaxation techniques in the nursing care group from pre-intervention to follow-up assessment differed significantly from the respective difference scores in the control group(21). From current researchers' point of view, educating elderly women help to improve healthy practices and help them to be active participants, decrease stress level and hence improve quality of life and all this necessity the need for such educational programs.

In relation to awareness about endometrial cancer prevention, The present study indicated that, the majority of elderly women and less than one quarter of them had good level of awareness in the post and follow up test respectively compared to none in the pretest in the study group whereas all of them had poor level of awareness in the pre, post and follow up test in the control group .These results consistent with the results of a study done by Elshami, et, al, (2020) on 3033 participants to examine public knowledge of cancer signs and symptoms as well as risk factors in Gaza and showed that the majority of the study participant had poor awareness about sign and symptoms and total awareness level of cancer(22). From current researchers' point of view, these may be due to low economic level of the elderly women as people with low income seeking all possible ways to control their condition rather than expending more money in the treatment as they as they lack health care access and access to preventive measures all these variables affect elderly women awareness about prevention of endometrial cancer so all of this necessitate the application of national insurance health system.

On the other hand, it contradicts the results of a study done by Özcan, & Demir Doğan, (2021) on 382 women in Turkey to evaluate and determine the gynecological cancer awareness among women aged 20 and over and make recommendations according to the current situation and showed that less than one half of the study participants had good level of awareness about gynecological cancer it its prevention(22). From current researchers' point of view, these findings put a great focus on such preventive programs on raising elderly women awareness about endometrial cancer prevention and expressing more evidence and effective decision about their health choices.

Regarding elderly women QOL, The result of the current study showed that, there was no statistically significant difference found between elderly women in the study and control group regarding total QOL mean score in the pretest test (1.00), whereas a highly statistically significant difference found between participants in the study and control group regarding total QOL mean score in the posttest .These findings completely matched with the results of the study done by Park, Yeom, & Sok, (2019) on 60 women in Korea to examine the effects of health promoting education program on self-efficacy, health promoting behavior, and quality of life of Korean women and found that no statistically significant difference found between participants in the study and control group regarding total QOL mean score in the pretest test (0.135) and that a highly statistically significant difference found between participants in the study and control group regarding total QOL mean score in the posttest (P<0.001*)(23). From current researchers' point of view, these results may be related to low economical level and presence of chronic diseases that effect on elderly women health, ability to enjoyment and satisfaction that reflected on QOL of the studied women and enhancing health promoting behavior.

The present study indicated that, all elderly women had moderate level of QOL in the post and follow up test respectively compared to majority of them in the pretest in the study group and that a highly statistical significant difference was found between total QOL mean score of elderly women in the study group in the pre, post, follow up test (P= 0.00) .These findings may be related to low socioeconomic standard of the participants and lack of access to health

educational programs that increase their knowledge and awareness about the disease that will be reflected in QOL and their life satisfaction .These results were improved after implementation of the program as majority of the studied women know the causes and risk factors of the disease in the post and follow up test. This result completely congruent with the results of Spees, et., al, (2019) on 29 participants in Ohio, USA to test the safety and efficacy of an intensive evidence-based garden intervention to improve outcomes for cancer survivors after curative therapy and found that compared to baseline, participants had significant improvements in quality of life(p = 0.004)(24). From current researchers' point of view, these results explained by the fact that, elderly complained of many normal physiological changes with aging that hinder the acquisition of knowledge and their ability to adapt to life change that effect quality of life. To sum up, Strengths of the current study includes demonstration and redemonstration of the recommended practices and emphasizing on healthy lifestyle and highlighting the need for health education and awareness campaign about endometrial cancer prevention among this vulnerable group. Meanwhile, current study also had certain limitation such as recall bias (3 months recall period). 2- elderly women Self-reporting of data with the possibility of over and under-reporting 3- Restriction to small sample size of elderly women so generalization of findings couldn't be gained

Conflict of Interest: No conflict of interest

Conclusion

Studied elderly women had poor knowledge, beliefs and inappropriate practices that predispose them to determinant health effect and make them more vulnerable to endometrial cancer. It can be concluded elderly women who exposed to endometrial cancer prevention program exhibited higher awareness and QOL total mean score than those who are not exposed and exhibited higher awareness and QOL total mean score than in the pretest**.** It can also be concluded that there were a highly statistical significant difference was found between total belief, practice, knowledge and QOL mean score of elderly women in the study group in the pre, post, follow up test (P= 0.00) whereas a highly statistical significant difference was found only between total beliefs mean score of elderly women in the control group in the pre, post, follow up test (P= 0.002) furthermore, no statistical difference found between elderly women regarding practice, knowledge and QOL mean score in the control group in the pre, post and follow up test (P= 0.240 , 0.085 and 0.250) respectively .These findings clearly necessitate the integration of endometrial cancer program into focus and as a priority.

Recommendations

Based on study findings, it was recommended to:
1. Plan and implement educational programs to increase awareness of young age females towards risk factors, early signs, and preventive measures of endometrial cancer.
2. Implementing Further research to evaluate the impact of endometrial cancer prevention on elderly women's awareness in different governorates.

3. Conduct a nationwide screening program for elderly women to detect any changes in the reproductive system to prevent endometrial cancer.
4. Follow a weight reduction program and maintain a healthy lifestyle strategy for all elderly women all over the nation.

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