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THE EFFECT OF DESIGNATED HEALTH PROMOTION PROGRAM ON THE INCIDENCE OF SIDE EFFECTS OF CHEMOTHERAPY AMONG BREAST CANCER PATIENTS

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Breast cancer is the most common type of cancer in women worldwide. Treatment of breast cancer often consists of a combination of surgical intervention, radiation therapy and medication (chemotherapy ,hormonal therapy and/or targeted biological therapy). Chemotherapy is an important therapeutic option for women with breast cancer but is often associated with unpleasant side effects. **Aim of the study:** To evaluate the effect of designated health promotion program on the incidence of side effects of chemotherapy among breast cancer patients. **Research design:** A quasi experimental research design. **Setting:** Oncology outpatient clinic in Fayoum University Hospital**. Methods:** A purposive sample of 60 adult patients from previously mentioned setting, allocated randomly into two equal groups (30 patients in each). **Tools**: Four tools were utilized, included: Structured Interview questionnaire, patients knowledge assessment questionnaire, patient's self-care practice questionnaire, Chemotherapy Side Effects Questionnaire. **Results:** There was a statistical significant difference between both groups as regarding knowledge (p-value= 0.002*), self-care practices (p-value= 0.004*) and incidence of side effects of chemotherapy post implementation of designated health promotion program with higher percentage of side effects of chemotherapy among control group. **Conclusion:** Application of the designated health promotion program had a positive effect on the outcomes of breast cancer patients undergoing chemotherapy. **Recommendations:** Apply the designated health promotion program to all cancer patients undergoing chemotherapy.

Key words: Breast cancer, Chemotherapy, Health Promotion.

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Introduction

Breast cancer is one of the most serious health problems worldwide. effective, and high-quality care, which necessitates the LMICs to develop strategic plans for its management **(Francies, etal., 2020 & Duggan, etal., 2020)**. Breast cancer management initiative includes early detection, diagnosis, treatment, and supportive care, all of which have the potential to improve patients' outcomes if done/delivered within a defined timeline **(Mutebi, etal., 2020)**. After a verified conclusive diagnosis, management success is contingent on timely referral and the availability of cancer treatment, followed by a multidisciplinary approach to care **(Ginsburg, et al., 2020)**.

Regarding breast cancer treatment can be highly effective, especially when the disease is identified early. Treatment of breast cancer often consists of a combination of surgical intervention, radiation therapy and medication (chemotherapy ,hormonal therapy and/or targeted biological therapy) to treat the microscopic cancer that has spread from the breast tumor through the blood. Such treatment, which can prevent cancer growth and spread, thereby saves lives. chemotherapy is commonly employed as a systemic treatment by clinicians. Combining with surgery, chemotherapy has been proven beneficial in many different types of breast cancer **(Zhu, et al., 2015 , Adamowicz & Baczkowska-Waliszewska., 2020).**

Chemotherapy is a systemic treatment used to stop or slow the growth of rapidly dividing cancer cells, that may produce many and varied side effects, both long and short term throughout the body. These effects will vary depending on the doses and combinations of the drugs prescribed. Some common side effects are: nausea and vomiting, diarrhea, stomatitis, anorexia, bone marrow depression, risk of infertility, alopecia, fatigue, renal toxicity, cardiac toxicity, extravasations and central nervous system toxicity. It is essential that relevant health care professionals have a good knowledge of the possible side effects of the chemotherapy, which is being delivered so that they can ensure the patient is fully informed **(American Society of Clinical Oncology(ASCI) , 2017).**

Poorly managed side effects and symptoms may result in delayed therapy, dose reductions, omitted doses, increased hospitalizations, has a negative impact on mood, physical function, work performance, social interaction, family care, cognitive performance, schoolwork, and community activities. It is more troublesome and has a greater negative impact on quality of life (QOL), as cancer patients become too tired to fully participate in the roles and activities that make life meaningful **(Weber & O'Brien, 2016 , Hekmatpou, etal., 2019)**.

Patient knowledge regarding disease and self-care practices are found to be important for patients to achieve the desired treatment goals and contribute meaningfully in the management of their disease **(Mekonnen, & Hussien, 2021).** Hence, health professionals must dynamically and carefully intervene in improving patients' self-care ability through well-designed and effective caring systems **(Riegel, et al., 2021).**

Therefore, it is critical to plan for the future health of breast cancer patients by implementing health promotion interventions during and after treatment. The need for health promotion may be even more critical for people with cancer whose quality of life and ability to continue living independently often heavily rely on maintaining their health, which may be significantly compromised by cancer **(Lin, 2016)**.

Significance of Study:

Breast cancer (BC) is an important global public health problem due to its high incidence and mortality. Breast cancer alone accounts for 30% of newly diagnosed invasive cancers in women in

the US. Together, the 3 most common types of cancer in woman—breast, lung, and colorectal—account for 50% of all new cases in women. An estimated 287,850 women will be diagnosed with invasive breast cancer in 2022. Incidence rates have increased slightly—by about 0.5% a year on average—since the mid-2000s. This may be due in part to increased obesity and women having fewer children or having their first child after age 30 **(American Cancer Society, 2023)** .

Breast cancer (BC) is an important global public health problem due to its high incidence and mortality. In 2020, an estimated 276,480 new cases of invasive breast cancer will be diagnosed in women in the U.S. as well as 48,530 new cases of non-invasive breast cancer. 64% of breast cancer cases are diagnosed at a localized stage, for which the 5-year survival is 99%. In Egypt, breast cancer is the most common cancer among women. It represents 16.4 % of total cancer cases (32.4 % in woman and 2.2 % in men) adjusted rate of 49.6 per 100 000 population. In its early treatable stage , breast cancer has a 97% probability of surviving 5 years **(Abo Afsa, etal., 2022).**

Aim of the Study

The present study aimed to evaluate the effect of designated health promotion program on the incidence of side effects of chemotherapy among breast cancer patients. through the following objectives :

- Assess health related needs of breast cancer patients undergoing chemotherapy.
- Design health promotion program for breast cancer patients undergoing chemotherapy.
- Implement health promotion program for breast cancer patients undergoing chemotherapy.
- Evaluate the effect of implementing designated health promotion program on the incidence of side effects of chemotherapy among breast cancer patients.

Research Hypothesis:

At the end of the study the incidence of side effects of chemotherapy among breast cancer patients who will receive the designated health promotion program will be less than the patients whom will not receive the designated health promotion program as measured by tool IV.

Theoretical Framework

The present study employed Orem's Self-care Deficit Nursing Theory (SCDNT) as a theoretical framework of reference in implementing the self-care management program. The theory includes the theoretical constructs of Self-Care, Self-Care Deficits and Nursing Systems **(Marques, et al., 2022).** According to the theory, nursing is required in situations of self-care deficits, which occurs when an individual is unable to fulfill self-care activities. It can encompass limitations in knowledge, the ability to perform actions, or making decisions, and nurses play an essential role in fulfilling the self-care need activities using the theory of the nursing system **(Aguirre, 2022)**.

According to Orem, nursing systems theory refers to “a series of actions a nurse takes to meet the patient’s self-care requisites". Orem describes the Nursing Systems as “fully compensatory” when the person is unable to perform self-care actions; “partially compensatory,” when the nurse and the patient at the same time engage in the action of self-care; and “supportive-education,” when the individual is able, through the nurse’s guidance, to perform and learn **(Orem & Taylor, 2011)**.

In this field, the present study was anchored in the supportive-education system. Thus, the objective is the application of the nursing process according to the model of self-care of Orem.

Orem comprises the nursing process as a method of determining self-care deficiencies that allows the definition of the roles of nurses and the self-care agent, so as to satisfy the self-care requisites. which is

configured in the action of the nurse to intervene on the needs of self-care, as well as to assess continuously the effects of this action **(Gonzalo, 2021)**.

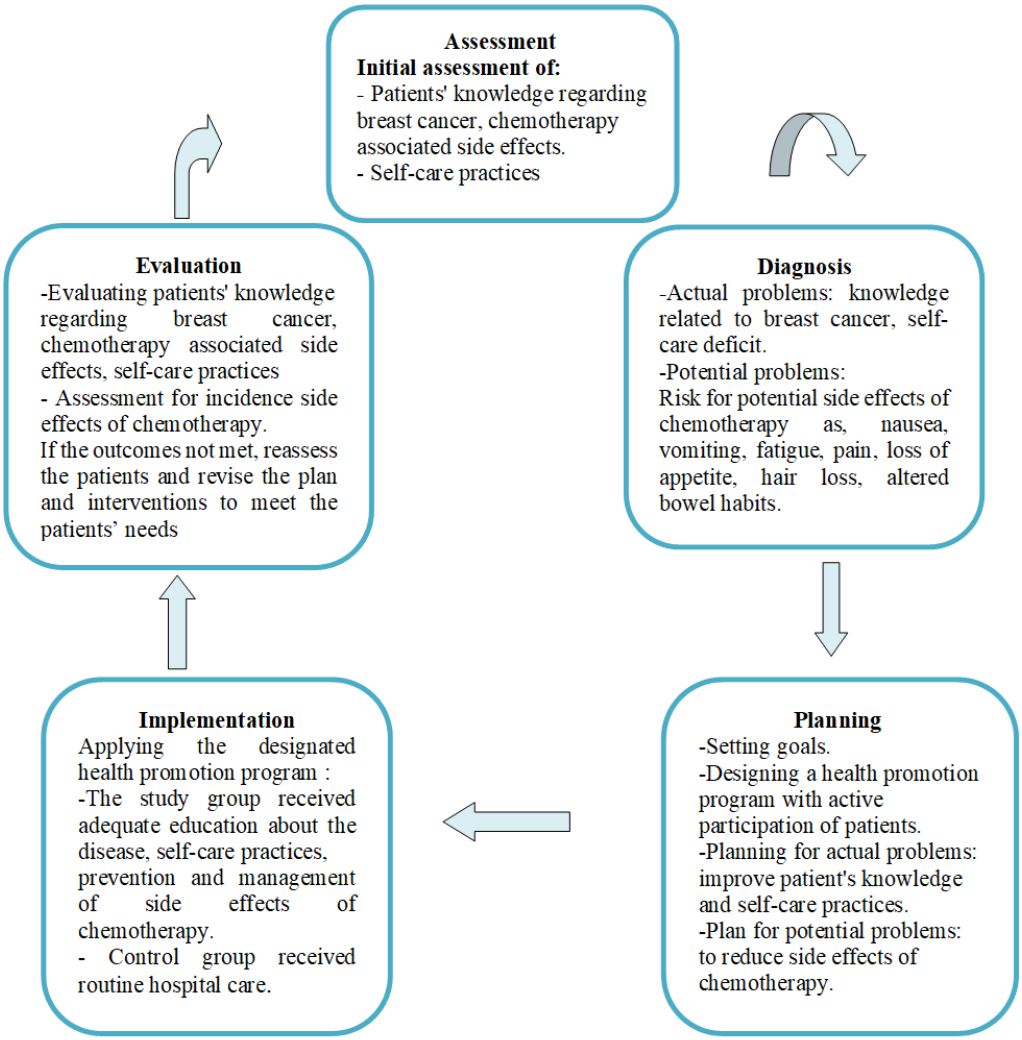

Figure (1): Nursing process according to Orem theoretical model for breast cancer patients undergoing chemotherapy designated by the researcher based on **(Githemo, 2017)**.

Subject and Methods

Research Design:

A Quasi-experimental design was utilized to conduct the study.

Setting:

This study was conducted at Oncology Outpatient Clinic in Fayoum University Hospital .

Subject:

A purposive sample of 60 adult patients(females). They were recruited from the above mentioned setting and divided into two equal study & control groups (30) patients for each group. The patients in both groups were selected according to the following criteria:

Inclusion criteria:

- Adult Patients agree to participate in the study.
- Breast cancer patients undergoing chemotherapy pre and post-surgery (Patient who received the first, second or third session).
- Patient able to communicate verbally.

Tools of Data Collection:

Four tools were used to collect the data according to the following :

Tool I: Structured Interview questionnaire

It developed by the researcher based on relevant, current national and international literature **(Avancini, 2020)** and consists of the following two parts that were fulfilled by the researcher and **it's includes:**

Part 1: Socio-demographic data, which include age, gender, residence , marital status, education, economic status and occupation.

Part 2: Health related data, which include the following items: medical diagnosis, stage of breast cancer, total chemotherapy treatment cycles, recent treatment cycle, Chemotherapy treatment regimen currently received , patient (past medical ,surgical history and present health history) family history(history of cancer, medical ,surgical history).

Tool II: patients knowledge assessment questionnaire.

This tool developed by the researcher based on relevant, current literature **(Bhore, & Mahadalkar, 2018)**. including the following: Patients' knowledge regarding definition of breast cancer , sign and symptoms of breast cancer, risk factor for breast cancer , treatment of breast cancer, chemotherapy and it is side effects. It consists of 8 true and false questions and 8 multiple choice questions (MCQ).

Scoring system: the questionnaire consisting of 16 questions, the correct answers were predetermined according to literature review, a correct answer was scored 1 point and incorrect answer was scored 0 point, and satisfactory level was detected based on statistical analysis as following:

Satisfactory knowledge level ≥70 %

Unsatisfactory knowledge level <70 %

Tool (III): patient's self-care questionnaire:

This tool developed by the researcher based on relevant, current literature **(Lin, 2016)** based on Pender,s model to assess the self-care practices of patients including the following: life style, health behavior, physical activities, nutrition and social role performance.

Scoring system: the total items of questionnaire were (17), each item has 2 levels of answers (not done, done). These were respectively scored (0, 1). The score of the items were summed up and the total divided by the number of items, giving a mean score. Competent practice level was detected based on statistical analysis as following:

Competent practice level ≥ 65 %

Incompetent practice level < 65 %

Tool IV: Chemotherapy Side Effects Questionnaire:

This tool developed by the researcher based on relevant, current national and international literature **(Batra, 2020)** to assess expected side effect that might develop among breast cancer patients undergoing chemotherapy including: Nausea, Vomiting, Change in appetite, Hair loss, Diarrhea, Constipation, Pain, Temperature changes, Shortness of breath, Bleeding or bruising, Problems with skin or nails, Problems with mouth or throat, Weight loss or gain, Eye Problems, Feeling weak, Difficulty sleeping, Feeling unusually tired, Headaches, Feeling anxious or worried, Feeling depressed.

Scoring system: Side effect assessed as not present, present respectively scored as 0, and 1 point for each problem.

Validity:

The content validity of the tools was done by a panel of 5 experts in nursing and medicine, who reviewed the content of the tools for comprehensiveness, accuracy, clarity, relevance and applicability. Suggestions were given and modifications were done.

Reliability:

Reliability of the tool was tested to determine the extent to which the questionnaire items are related to each other. The Cronbach's alpha model, which is a model of internal consistency, was used

in the analysis. Statistical equation of Cronbach's alpha reliability coefficient normally ranges between 0 and 1. Higher values of Cronbach's alpha (more than 0.7) denote acceptable reliability.

Ethical consideration:

An ethical approval to conduct the proposed study was obtained from the Scientific Research, Ethical Committee of the faculty of Nursing, Helwan University. An official permission was obtained from the administrative authority of the selected setting for the current study.

The researcher obtained consent from the studied patients, explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of data assured by the researcher by using codes to identify participants instead of names or any other personal identifiers.

Pilot study:

A Pilot study was carried out with 10% (not less than 10 patients) of the sample under study. Patients who shared in pilot study excluded from the study sample.

Field Work:

Sampling was started and completed within six months from July 2022 to the end of December 2022 and carried out through five phases: assessment, diagnosis, planning, implementing and evaluation.

I- Assessment Phase:

- The researcher collect data regarding to participants' sociodemographic and health history. Data collection was held through structured interviews and medical record chart.
- each patient was assessed individually, and data collection was filled by the researcher, by using tools(I) , tool (II), tool (III), tool (IV) for both study and control groups.

II- Second phase (diagnosis phase)

According to Orem's theory diagnosis provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable, actual problems includes: knowledge deficit related to breast cancer, self-care deficit, Potential problem: risk for side effects of chemotherapy such as, nausea, vomiting, fatigue, pain, loss of appetite, hair loss, altered bowel habits.

III- Planning and design phase:

-The researcher plan intervention, design the educational section's content according to the patient's needs. Detected needs, requirements and deficiencies were translated into the aim and objectives of the designated health promotion program in the form of booklet.

- The educational training program was written in simple Arabic language easy to be understood from patients.

III- Implementation phase:

- designated health promotion program was developed by the researcher and implemented immediately after the pre-test. No intervention was performed for the control group during the study.
- implementing the designated health promotion program for the study group (30) patient. the program was divided into 4 sessions (2 theoretical, and 2 practical sessions) each session was implemented in one day. The duration of each session varied, according to its contents as well as the clients' response.
- Each participant obtains a copy of booklet. The researcher used pictures for illustration, and video to educate the patient.

IV- Evaluation phase:

Evaluation was done by using the posttest questionnaire which was the same format of pre-test, using assessment tools (II, III,IV).

Result

Table (1): Frequency and percentage distribution of socio-demographic characteristics for both study and control groups (N: 60).

Variable	Study group (n=30)		Control group (n=30)		Test	P-value
	N	%	N	%		
Age group:						
20-29 Yrs	4	13.3	3	10	x^2 = 0.166	0.920
30-39 Yrs	5	16.7	5	16.7		
40-59 Yrs	21	70	22	73.3		
Mean ± SD	44.60±9.72		43.80±15.6		*t-test=0.237*	0.813
Gender:						
Male	0	0	0	0	Not computed	
Female	30	100	30	100		
Marital Status:						
Single	0	0	6	20		
Married	24	80	18	60	*x2 =9.257*	0.026*
Widow	4	13.3	6	20		
Divorced	2	6.7	0	0		
Level of Education:						
Not read and write	14	46.7	21	70		
Read and write	4	13.3	2	6.7		
Primary education	0	0	0	0	*x2 =11.06*	0.02*
Preparatory education	1	3.3	5	16.7		
Secondary education	10	33.3	2	6.7		
University	1	3.3	0	0		
Occupation:						
Not Employee	26	86.7	27	90	*x2 =0.161*	0.688
Employee	4	13.3	3	10		
Economic Status:						
Sufficient	4	13.3	5	16.7	*Fisher's Exact test =0.131*	0.445
In Sufficient	26	86.7	25	83.3		
Place of residence:						
Rural	27	90	24	80	*Fisher's Exact test =1.176*	0.472
Urban	3	10	6	20		

** Significant at P ≤ 0.05*

Table (1) illustrates that there was no statistically significant difference between study and control groups, as regarding socio-demographic characteristics like; age, gender, occupation, residence and economic status, which indicated proper matching between study and control groups in these variables.

As well, table shows that the mean and standard deviation values of age of the studied patients in both groups was 44.60±9.72, 43.80±15.6 years old respectively, added, all studied patients were females. added four quarters of them 80%, 60% were married, more than four quarters of the studied patients were not employee and lives in rural area with insufficient economic status.

Table (2): Frequency and percentage distribution of health related data for both study and control groups (N:60).

Past health history	Study group (n=30)		Control group (n=30)		Test	P-value
	N	%	N	%		
A) Medical History						
Diagnosis:						
Diabetes Mellitus (DM)	1	3.3	1	3.3		
Hypertension (HTN)	3	10	7	23.3	*x2 =3.60*	0.165
DM&HTN	6	20	2	6.7		
Duration: Mean ± SD	1.3±0.46		1.8±0.714		*t-test=-* 3.211	0.002*
B) Surgical History						
Name of surgery						
Cardiac catheterization	1	2.9	0	0		
Ectopic pregnancy	1	2.9	0	0		
CS	6	17.1	4	11.4		
Mastectomy	7	20	9	25.7	*x2 =7.628*	0.267
Cholecystectomy	2	5.7	0	0		
Hysterectomy	1	2.9	1	2.9		
Hemorrhoid	0	0	3	8.6		
Duration of previous medical/surgical diagnosis: Mean ± SD	6.87±1.61		1.88±0.410		*t-test=* 3.01	0.005*

**: Significant at P ≤ 0.05*

Table (2) shows that, there was no statistically significant difference between past history of the two groups regarding previous medical diagnosis of disease (*P*-value = 0.165), and name of previous surgeries(surgical history) (*P*-value = 0.267). On the other hand, there was a statistically significant difference between the two groups as regarding mean duration of previous medical and surgical diagnosis *P*-value = 0.002, 0.005 respectively.

Table (3): Frequency and percentage distribution of health related data for both study and control groups (N: 60).

Present health history	Study group (n=30)		Control group (n=30)		Test	P-value
	N	%	N	%		
Length of time since diagnosis:						
<5 months	21	70	11	36.7		
>5 months	9	30	14	46.7	*x2 =9.212*	0.01*
>1 year	0	0	5	16.6		
Stage of disease:						
Stage I	2	6.7	1	3.3		
Stage II	13	43.3	11	36.7	*x2 =2.024*	0.567
Stage III	8	26.7	13	43.3		
Stage IV	7	23.3	5	16.7		
Chemotherapy regime currently received						
FAC(Fluorouracil, Adriamycin, and Cytoxan)					*x2 =1.417*	0.702
AC(Adriamycin,Cychlophosphamide)	1	3.3	0	0		

Gemzar& Carboplatin Taxol	23 4 2	76.7 13.3 6.7	25 4 1	83.3 13.3 3.3		
Recent treatment cycle: 1st 2nd 3rd	10 20 0	33.3 66.7 0	6 17 7	20 56.7 23.3	*x2 =8.243*	0.016*

**: Significant at P ≤ 0.05*

Table (3) shows that, about three quarters of the studied patients in the study group and about half of the studied patients in control group were diagnosed since less than five months and about three quarters of study group, and more than four fifths (83.3%) of control group, were receiving AC as a chemotherapy treatment.

Table (4): Frequency and Percentage Distribution of the total patient's knowledge pre and post implementation of designated health promotion program for study and control groups (N:60).

Variable	Total Patient's Knowledge (n = 60)								Test	P-Value
	Study group (n=30)				Control group (n=30)					
	Pre		Post		Pre		Post			
	N	%	N	%	N	%	N	%		
Unsatisfactory • **Satisfactory**	**19** **11**	**63.3** **36.7**	**7** **23**	**23.3** **76.7**	**18** **12**	**60** **40**	**19** **11**	**63.3** **36.7**	**X2=4.043**	**0.044***
	X2=9.774 **p-value= 0.002***				**X2=0.071** **p-value= 0.791**					

**: Significant at P ≤ 0.05*

Table (4) indicates that, there was a high statistically significant difference between the two groups regarding patient's total knowledge pre and post implementation of designated health promotion program with P-value = 0.044*, with higher statistical significance among study group regarding patient's total knowledge pre and post implementation of designated health promotion program with P-value = 0.002

Figure (1): Total patients knowledge pre and post implementation of designated health promotion program for study and control groups(N:60).

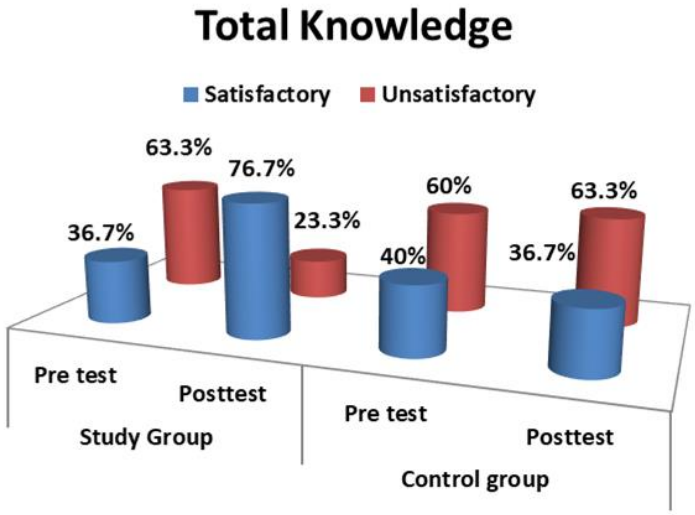

Figure (1) shows that, there was a high statistically significant difference between the two groups regarding patient's total knowledge pre and post implementation of designated health promotion program .

As well , table showed that 36.7% of the study group had satisfactory level of knowledge in pre scores compared to 76.7% in post, while 40% of control group had satisfactory level of knowledge in pre compared to 36.7% in post.

Table (5): Frequency and Percentage distribution of the total patient's self-care practice pre and post implementation of designated health promotion program for study and control groups (N:60).

Variable	Total Patient's Self-care practice (n = 60)								Test	P-Value
	Study group (n=30)				Control group (n=30)					
	Pre		Post		Pre		Post			
	N	%	N	%	N	%	N	%		
Incompetent Competent	21 9	70 30	10 20	33.3 66.7	17 13	56.7 43.3	18 12	60 40	X2=0.539	0.463
	X2=8.076 p-value= 0.004*				X2=0.069 p-value= 0.793					

**: Significant at $P \leq 0.05$*

Table (5) indicates that, there was statistically significant difference between the two groups regarding total patient's self-care practice pre and post implementation of designated health promotion program.

Figure (2): Total patient's self-care practice post **implementation of designated health promotion program for study and control groups (N:60).**

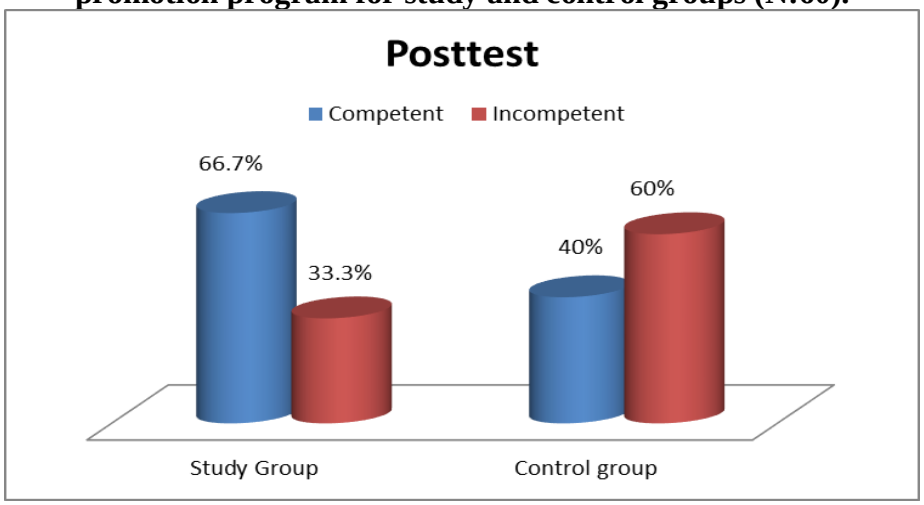

Figure (2): show that, there was statistically significant difference between the two groups regarding total patient's self-care practice post implementation of designated health promotion program.

Table (6): Total chemotherapy side effects post implementation of designated health promotion program for study and control groups (N:60).

Variable	Studied patients (n : 60)								X2	P-Value
	Study group (n:30)				Control group(n:30)					
	Not Present		Present		Not Present		Present			
	N	%	N	%	N	%	N	%		
Nausea	**28**	**93.3**	**2**	**6.7**	**5**	**16.7**	**25**	**83.3**	**35.623**	**0.000***
Vomiting	**28**	**93.3**	**2**	**6.7**	**5**	**16.7**	**25**	**83.3**	**35.623**	**0.000***
Constipation	**30**	**100**	**0**	**0**	**20**	**66.7**	**10**	**33.3**	**12.000**	**0.001***
Diarrhea	**30**	**100**	**0**	**0**	**20**	**66.7**	**10**	**33.3**	**12.000**	**0.001***
Pain	**8**	**26.7**	**22**	**73.3**	**1**	**3.3**	**29**	**96.7**	***6.405***	**0.026***
Shortness of breath	**17**	**56.7**	**13**	**43.3**	**6**	**20**	**24**	**80**	***8.531***	**0.007***
Temperature changes	**28**	**93.3**	**2**	**6.7**	**28**	**93.3**	**2**	**6.7**	***0.000***	**1.000**
Bleeding or bruising	**30**	**100**	**0**	**0**	**25**	**83.3**	**5**	**16.7**	***5.455***	**0.052**
Problems with skin or nails	**20**	**66.7**	**10**	**33.3**	**12**	**40**	**18**	**60**	***4.286***	**0.069**
Hair loss	**5**	**16.7**	**25**	**83.3**	**3**	**10**	**27**	**90**	***0.577***	**0.706**
Problems with mouth or throat	**19**	**63.3**	**11**	**36.7**	**3**	**10**	**27**	**90**	***18.373***	**0.000***
change in appetite	**23**	**76.7**	**7**	**23.3**	**2**	**6.7**	**28**	**93.3**	***30.240***	**0.000***
Weight loss or gain	**21**	**70**	**9**	**30**	**10**	**33.3**	**20**	**66.7**	***8.076***	**0.009***
Eye Problems	**15**	**50**	**15**	**50**	**16**	**53.3**	**14**	**46.7**	***0.067***	**1.000**
Feeling weak	**9**	**30**	**21**	**70**	**4**	**13.3**	**26**	**86.7**	***2.455***	**0.209**
Difficulty sleeping	**18**	**60**	**12**	**40**	**4**	**13.3**	**26**	**86.7**	***14.067***	**0.000***
Feeling unusually tired	**29**	**96.7**	**1**	**3.3**	**10**	**33.3**	**20**	**66.7**	***26.447***	**0.000***
Headaches	**4**	**13.3**	**26**	**86.7**	**1**	**3.3**	**29**	**96.7**	***1.964***	**0.353**
Feeling anxious or worried	**9**	**30**	**21**	**70**	**1**	**3.3**	**29**	**96.7**	***7.680***	**0.012***
Feeling depressed	**27**	**90**	**3**	**10**	**13**	**43.3**	**17**	**56.7**	***14.700***	**0.000***

*****: Significant at $P \leq 0.05$*

Table (6): shows that, there were a statistically significant difference between the two groups regarding majority of chemotherapy side effect within post implementation of designated health promotion program. There were statistically significant improvement and decrease in chemotherapy side effects among the study group.

Table (7): Correlation between patient's total knowledge and (Socio-demographic characteristics, self-care practice, and chemotherapy side effects).

Variable	Patient's knowledge	
	Correlation	Correlation
Age	-0.131	0.317
Marital status	-0.198	0.130
Level of Education	0.327	0.011*
Occupation	-0.125	0.343
Self-care practice	0.145	0.267
Chemotherapy side effect	-0.425	0.001*

*****: Significant at $P \leq 0.05$*

Table (7) showed that, there was a negative correlation between age, marital status & occupation and patient's knowledge with no statistically significant difference (*P*- value = 0.317, 0.130 and 0.343 respectively), while there was a positive correlation between total self-care practice and patient's total knowledge with no statistically significant difference (*P*-value= 0.267,). There was a positive correlation between level of education and patient's total knowledge with a statistically significant difference (*P*-value= 0.011*) while, there was a negative correlation between chemotherapy side effect and patient's knowledge with a statistically significant difference (*P*-value= 0.001*).

Table (8): Correlation between Chemotherapy side effects and socio-demographic characteristics.

Variable	Chemotherapy side effect	
	Correlation	Correlation
Age	0.101	0.443
Marital status	0.450	0.00*
Level of Education	-0.167	0.203
Occupation	0.046	0.725
Economic status	0.089	0.498
Place of residence	0.214	0.100

**: Significant at P ≤ 0.05*

Table (8) showed that, there was a positive correlation between marital status and chemotherapy side effect with a statistically significant difference (*P*- value = 0.00*), while there was a negative correlation between level of education and chemotherapy side effect with no statistically significant difference (*P*-value=0.203). There was a positive correlation between age, occupation, economic status& place of residence and chemotherapy side effects with no statistically significant difference (*P*-value= 0.443, 0.725, 0.498, and 0.100 respectively).

Discussion

The socio-demographic characteristic of subjects in both study and control groups, were no statistically significant difference ; this means that the participants were selected from identical population of breast cancer patients undergoing chemotherapy with good random allocation obtained. That indicate proper randomization of study, this randomization is an indicator that variation between studied patients will be a result to the effect of the designated program without bias. This explanation goes with **Kang, (2017)** who conducted a study about "Random allocation and dynamic allocation randomization" reported that randomization plays an important role in increasing the quality of evidence-based studies by minimizing the selection bias that could affect on the outcomes.

Regarding to patients Age; study findings revealed that the majority of studied patients aged from 40 to 60 years , the mean age of the studied patients in both study and control groups was (44.60±9.72, 43.80±15.6) respectively. this could be as a result of age-related intrinsic changes in breast tissue and hormonal changes may be expected to worsen in its function and lead to breast cancer. This findings agree with **Abd Allah, et al., (2021)** who conducted a study in titled "Assessment chemotherapy-

induced dermatological adverse reactions and its effect on QoL among 100 older women with breast cancer in Egypt" who reported that more than half of studied sample aged 60–65 years.

Regarding to patients Gender ,the finding of the present study showed that, all studied patients are females this could be as a result of that the females gender are more risk factor for breast cancer. This findings also agree with **Abd Allah, et al., (2021)** who reported that all studied patients were females. This finding in the same line with **Abo Afsa etal., (2022)** who conducted a study about "Effect of Nutritional Teaching Program on Clinical Outcomes for Breast Cancer Patients Undergoing Chemotherapy" , carried out in Egypt, who reported that breast cancer is the most common cancer among women. It represents 16.4 % of total cancer cases (32.4 % in woman and 2.2 % in men) .

Regarding to Marital Status the present study show that the majority of studied patients were married. This could be as a result of majority of studied patients are old age not younger girls. This findings agree with **Richter-Ehrenstein,etal., (2021)** who conducted a study about "Impact of breast cancer diagnosis and treatment on work-related life and financial factors" who reported that 71.8% studied patients were married. This result was similar to **Hoffmann, etal., (2018)** who conducted a study about " Prevalence of dermatological complaints in patients undergoing treatment for breast cancer" who reported that majority studied patients were married.

This results is also supported by **Mohamed & Mohamed, (2016)** who conducted "Effects of Walking Exercise Program on Chemotherapy Induced Fatigue, Physical Functional Status, and Symptoms Distress Among Cancer Patients. in inpatients departments of Mansoura oncology center" mentioned that, the most of the studied patients in both study and control groups were females and married**.**

Regarding to Level of educational, the present study showed that majority of the studied patients not read and write. From the researcher's point of view, this may be because higher percentage of the current study were old age women, and in the past, parents did not care about female's education so that majority of the studied sample could not read and write.

The finding of the present study was supported by **Khater, et al., (2019)** who conducted a study about "Health related quality of life among Egyptian female breast cancer patients at the National Cancer Institute, Cairo University". The study mentioned that nearly half of the studied patients were not educated (cannot read and write). This findings supported by **Atta, etal., (2022).** who studied " Quality of life among elderly women with breast cancer who received chemotherapy at Sohag Cancer Institute, Sohag Governorate". revealed that the Seventy-two percent of the studied patients could not read and write.

This findings disagree with **Abd Allah, et al., (2021)** who conducted a study about "Assessment chemotherapy-induced dermatological adverse reactions and its effect on QoL among 100 older women with breast cancer in Egypt" who reported that more than-one third of the studied patients cannot read and write.

As regarding economic status, the finding of the present study showed that majority of studied patients with insufficient economic status this may be because all the study samples were housewives not working and old age so they had not enough monthly income. consistent with study by **Alagizy et al. (2020)** who conducted a study about "Anxiety, depression and perceived stress among breast cancer" carried out in Egypt, reported that nearly three-quarters of the selected sample had insufficient income (not enough monthly income). Concerning to place of residence, the finding of the present study showed that majority of studied patients lived in rural

area. The study finding was supported with **Saadoon (2020)** who conducted a study about " The relationship between socio-demographic characteristics and quality of life among breast cancer women undergoing adjuvant chemotherapy" carried out in Egypt, reported that, nearly three-quarters of the selected sample lived in rural areas. This findings also supported by **Atta, etal., (2022)** who revealed that, 62% of studied patients lived in rural areas.

The finding of the present study demonstrated that the highest percentage in the studied patients in both study and control group have unsatisfied total knowledge regarding breast cancer, chemotherapy side effects ,its management and self- care practice during pre-implementation of health promotion program. The result of the study also indicated that there was no significant difference between study and control groups .This indicated proper randomization & matching between two groups in these variables.

According to the opinion of the researcher, the level of self- care practice and knowledge was insufficient due to educational level that the majority of the studied patients not read and write. Also may be due to unavailability of training programs for patients, lack in continuous educations and most health care providers did not routinely counsel women or providing them with written information about breast cancer, chemotherapy side effects ,its management and self- care practice.

This explanations was in the same line with **Mehejabin, & Rahman, (2022)** who conducted a study about "Knowledge and perception of breast cancer among women of reproductive age" revealed that, the majority of the studied women had unsatisfactory knowledge about breast cancer .

The result of the present study demonstrated that, there is an improvement in patients' knowledge in the study group after the implementation of program provided by the researcher, in the form of individual face to face sessions, written educational booklet, compared with patients in control group who received routine care.

The finding of the present study was supported by **Abd ElKareem Moghazy,etal., (2020).** who conducted a study about " Effectiveness of Self-Care Practices Education Program on Enhancing Chemotherapy Adverse Effects and Quality of Life for Patients with Gastric Cancer", carried out in Egypt, reported that a highly statistically significant difference and improvement in total patients' knowledge post intervention of the program as compared to pre-intervention, This finding is in line with **Soliman et al., (2018)** who conducted a study about " Effect of a planned educational programme regarding post mastectomy exercises on living activities among breast cancer" who reported that there are a statistically significant difference in the patients mean knowledge score before and after the intervention.

The present study findings clarified that there was highly statistical significant difference among both study and control groups regarding self-care practice after implementation of health promotion program. This findings agree with **Rakhshani, et al. (2022)** who stated in a study about "The effect of Orem-based self-care education on improving self-care ability of patients undergoing chemotherapy: a randomized clinical trial" in Iran, showed that, a statistically significant difference was seen between the study and control group after the educational intervention.

The present study findings clarified that, there were a statistically significant difference between the two groups regarding majority of chemotherapy side effect within post implementation of designated health promotion program. There were statistically significant

improvement and decrease in incidence of chemotherapy side effects among the study group.

The finding of the present study was supported by **Abd ElKareem Moghazy,etal., (2020),** who conducted a study about " Effectiveness of Self-Care Practices Education Program on Enhancing Chemotherapy Adverse Effects and Quality of Life for Patients with Gastric Cancer", carried out in Egypt, reported that, a significantly lower level of symptom severity and a significantly improved level of chemotherapy side effects after using self-care educational guidelines by patients, particularly in using suggested medication. This result also agree with **Karimi et al., (2017),** who conducted a study about "Surveying the effect of a self-care education program on severity of nausea and emesis in colorectal cancer patients under chemotherapy", who found that self-care instruction can help the patients to manage adverse effects of chemotherapy.

The finding of the present study was also supported by **Şahin, & Ergüney, (2016),** who conducted a study about "Effect on symptom management education receiving patients of chemotherapy", carried out in Turkey. Reported that chemotherapy adverse effects, such as nausea, vomiting, feeling distressed/anxious, feeling gloomy and dissatisfied, unusual exhaustion, and difficulties of sleeping, were shown to be statistically significantly reduced, as well as the severity or discomfort level of adverse effects of chemotherapy also statistically significantly decreased, suggesting that focused education provided by healthcare practitioners had a positive impact on patients to control adverse effects of chemotherapy..

Conclusion

Based on the findings of the study, it can be concluded that, designated health promotion program had a positive effect on the outcomes of studied patients among study group as regarding the incidence of side effects of chemotherapy, knowledge and self-care practices, compared to control group, as well as there was statistically positive correlation with high significance between knowledge and self-care practice.

Recommendation.

- Apply the designated health education program to all patients undergoing chemotherapy.
- Use a larger and more general sample to confirm the findings on a larger scale. Using different clinical settings and geographic locations to enhance the generalizability of findings.
- Involve registered nurses or educators in programs about prevention and management of chemotherapy side effects . The implementation should be guided by a competent and trained health care professional.
- Nursing staff should apply the educational instrument that would help patients be more familiar with self-care practice , embrace it, and reach positive outcomes.

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