Nursing Intervention Based on Neuman's Model for Chemotherapy-Induced Nausea and Vomiting among Women with Breast Cancer

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Abstract: *Chemotherapy-induced nausea and vomiting has significant and distressing side effects caused by cancer itself and significantly lowered quality of life. The present study aimed torecognizedthe effect of nursing intervention based on neuman's model for chemotherapy-induced nausea and vomiting among women with breast cancer. Design: control and study design (A quasi experimental design) was utilized.Setting: The study was conducted at Out-patient clinics at Oncology Institute, Menoufia University, Egypt. Sampling: sample of 150 women with breast cancer selected by convenience sample. The study tools: Tool (I):- Structured interview questionnaire.Tool (II) A standardized self-administered chemotherapy-induced nausea and vomiting diary.Tool (III): Functional Assessment of Cancer patients. Results:It was observed that the Mean knowledge score was16.49±6.98 pre intervention to be an 32.85±0.48 post intervention. results reveled statistically significant differences between pre and post nursing intervention among studied group p- value were ≤ 0.0001. There was an improvement of physical ,social ,emotional and functional well being among study group as compared with control groupThe results showed that there were significantly differences score for study group rather than control group post intervention in decreasing severity, frequency and onset regarding to nausea and vomiting experience.Conclusion: The study concluded that women who received nursing intervention based on Neuman's model had less episodes of frequency, onset and severity of chemotherapy-induced nausea and vomiting. Recommendation:Application of nursing intervention based on Neuman's model for chemotherapy-induced nausea and vomiting as a complementary therapy should be carried out at different setting and different types of cancer.*
Key words: Neuman's model - Chemotherapy induced nausea and vomiting, and breast cancer.

I. Introduction

Cancer is the most common health problem in the world. The incidence of cancer increased to became by 2020 more than 17 million people. Breast cancer is the most common cancer and second to lung cancer as a cause of cancer death in women in the United States.Annually in the United States over 176,000 women are diagnosed with breast cancer. In 2016 about 247,660 Americans were diagnosed with invasive breast cancer and about 40,460 died from the disease.[1,2]**.**

In Egypt, across sectional studies conducted by Amal et.al., (2014)[3] to identify the incidence of cancer in Egypt. The Studies revealed that breast cancer is the most prevalent cancer, the annual rate of developing cancer is 115.5 cases per 100 thousand people and the annual rate diagnosed with breast cancer for females is equivalent to 36 cases per 100 thousand females and accounting for 36% of all cases treated at the National Cancer Institute as well as, a progressive increase in number of incident cases of breast cancer to reach 47,245 case in 2050 [4].

Statistical records of cancer in clinical Oncology department; Menoufiya University (2017) reported that about 1522 patients with cancer were admitted to the outpatient clinics in 2016, about 550 cases of breast cancer rate 36% from total cases. According to registers of oncology units of ministry of health inMenoufiya governorateit was estimated that about 250 of cases was breast cancer from total cases in 2017 [4-5].

Chemotherapy-induced nausea and vomiting (CINV) are the most common side effects of anticancer therapy. CINV is often associated with many complications such as fatigue, muscle strain , metabolic imbalance and inadequate caloric and fluid intake. Inadequate management of CINV adversely affects quality of life , how

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treatment is perceived and also lead to stress, discomfort, and limited social, professional, and personal activity [6-9]

TheNeuman Systems Model(NSM) provides a systematic approach in identifying the potential effect of the client-related factors and nursing interventions as preventatives for the development of CINV. The NSM is an open systems model that include the four nursing metaparadigms: person, health, environment, and nursing. The model focus on the wellness of the client in relation to environmental stress and reaction to stress .AlsoNeuman's open systems approach is constantly changing to maintainclient stability and survival [10].

The breast cancer patients demonstrated being with the flexible defense line little tough, for they showed changes due to physiological, psychological and social changes. Such line was enhanced and aggravated by the identified stressors. In addition to this, the normal defense line also appeared shaken, since women with chemotherapy induced nausea and vomiting were trying to adapt to changing circumstances. In this sense, the clients needed some interventions to enable the confrontation of the identified stressor forces and the reconstitution of the flexible and normal defense lines, thus protecting the resistance line and avoiding system imbalance as a whole [11].

Neuman accepts that nursing may be concerned for the entirety people. She sees nursing as a unique profession that it is concerned with every variables influencing an individual's response to stress.Thenursing goal is to maintain stability of the client system by providing nursing intervention to decrease the stressors.Neuman's process contains three basic parts: nursing diagnosis, nursing goals, and nursing outcomes.In all stages of the process Neumanfocuses on the significance of identifying the client's and the caregiver's perceptions and cooperation. She identifies three levels of intervention: primary, secondary, and tertiary .Primary prevention arecarried out for the client before the client system can respond to a stressor for reducing the possibility of encounter with the stressor. Secondary prevention are carried out for the client after the client system responds to a stressor. Tertiary prevention occurs after secondary prevention stage that it focuses on readjustment toward optimal client system stability[11,12].

Significance of the study

Breast cancer is the most common form of cancer among women, with an estimated 226,870 new cases of breast cancer expected to be diagnosed in Egypt, the breast cancer incidence rates for women in 2012–2017 based upon data of the National Cancer Registry Program of Egypt was 32 %, resulting in approximately 39,510 breast cancer deaths [13].

Turini , Piovesana , Ruffo (2015) [14]. performed an assessment of chemotherapy induced nausea and vomiting direct costs in three European countries. Theyfound that there are benefits of proper CINV control. CINV of high intensity increase the general cost of the treatment. Also leads to additional cost of the antiemetic drugs, supporting drugs, of rehydrating a patient,readmission to the outpatient unit or to the hospital ward and indirect costs related to sick leave or to worse quality of life.

Neuman's systems model is a holistic approach that encourages an interdisciplinary focus to health promotion, maintenance of wellness, prevention and management of stressors that are perceived as determinates for ill health. Neuman application to modern day nursing practice and can be applied to women with breast cancer experiencing CINV to attain the desired nursing outcomes. It helps to identify specific predictors of CINV that need to be included in the assessment, intervention, and evaluation [15].

Aim of the Study

The present study aim is to identify the effectiveness ofnursing intervention based on neuman's model for chemotherapy-induced nausea and vomiting among women with breast cancer.

Research Hypothesis

The following research hypothesis were formulated in an attempt to achieve the aim of the current study:
- Women who will receive nursing intervention based on neuman's model (study group) will have less episodes of frequency, onset and severity of chemotherapy-induced nausea and vomiting than women who will receive routine hospital care (control group).
- There will be an improvement of physical ,social ,emotional and functional well being among study group as compared with control group.
- There will be an improvement of knowledge among study group as compared with control group.

II. Subjects

2.1, **Research Setting**:
The present study conducted at the outpatient clinics of Clinical Oncology Department of Menoufia University Hospital, Menoufia Governorate, Egypt.

2.2, Research Design: The current study utilized a quasi-experimental (study and control design) .

2.3, Subjects:

The sample size in the present study calculated according to small effect size that is expected to be 0.3 (Cohen, 1988), To achieve 80% power to detect this difference with significance level of 0.05. It is estimated that 65 subject per group would be required.

The sample size in the present study 150 patients were selected by convenience sample then it divided randomly based on sample size calculation as who carry out the randomized controlled clinical trial study that rendered 150 subjects 75 subjects in each group based on 70-80% prevalence rate of chemotherapy induced nausea and vomiting among patients with cancer, 41-43% of breast cancer patients receiving moderately emetogenic chemotherapy experience nausea and vomiting with at least 80% power at two-sided 95% significance level and ratio of case ∕ control 1:1 In the current study, 150 patients were divided alternatively into two equal groups; 75 for each group:

-**Study group (I):** received routine hospital care plus nursing intervention based on neuman system model.
-**Control group (II):** received routine hospital care only. The women selected according to the following criteria
Inclusion criteria:
All women who were experiencing chemotherapy induced nausea and vomiting treatment, in all ages was recruited.

2.4, Variables:
The independent variable was nursing intervention based on numan system model, while the dependent variable was chemotherapy induced nausea and vomiting among patients with breast cancer.

2.5, Tools of the study:
Three tools were used for data collection, based on review of related literature, these tools were :

2.5.1, Tool (1):- Structured interview questionnaire: It was developed by researchers following an extensive, relevant literature review[11,14] to assess the socio-demographic data & knowledge of women. It was comprised of four parts:-

• **Part I:** socio-demographic data of studied women including age, marital status, education, occupation, and income.
• **Part II. Medical data:-**Include chronic diseases, diagnosis of breast cancer, onset of disease, stages of breast cancer, type of chemotherapy , frequency and side effect of chemotherapy.
• **Part III. Assessment of environmental stressors:-**
Environmental stressors: Include internal , external & relation with medical staff.
• **Part IV Knowledge Assessment Questionnaire:** It was comprised of questions to assess women knowledge about the disease process and nursing intervention according to the components of neuman model as the following:

knowledge about Disease process (definition, risk factors, chemotherapy, causes of nausea and vomiting at home and hospital & factors that increase and decreased chemotherapy induced nausea and vomiting).

Primary ,Secondary & Tertiary prevention: Diet, exercise, relaxation technique, social support.
Each question was given a score of two for complete correct answer, one for incomplete correct answer and zero for wrong answer or no answer, and then all score was summed up. The total score ranged between zero to 100.

The women score	Knowledge level
Less than 50%	Poor
From 51- 80%	Moderate
≥ 81%	High

2.5.2, Tool (2). A standardized self-administered chemotherapy-induced nausea and vomiting diaryin
Which scores on a standard visual analogue scale (VAS) for assessing the severity, frequency and onset of nausea and vomiting episodes adopted from[15]. Visual analogue scale was in a ten-centimeter ruler the scoring from (0 = no nausea & vomiting ,(1-3) = mild nausea& vomiting, i.e. presence of nausea & vomiting but able to do all daily activities, (4-7) = moderate nausea and vomiting i.e. unable to do all daily activities, (8-10) = severe nausea and vomiting i.e. bedridden because of nausea and vomiting). Patient was considered had acute nausea or acute emesis if nausea occurred at least one episode of nausea and/or vomiting was reported during the first 24

hours after start of chemotherapy. Any episodes of nausea and/or vomiting thereafter up to 5 days after chemotherapy was considered delayed. The administration of chemotherapy was followed by 5 days of recording of nausea and vomiting. To examine the women were provided with a daily diary and asked to record at home, for each day during the 5 days after their course of chemotherapy, The frequency ,onset and severity of nausea and vomiting episodes. To ensure accurate completion of the diary, each patient was contacted by telephone or in person on day 2, to remind her to fill in the diary, and on day 5.

2.5.3, **Tool (3): Functional Assessment of Cancer Therapy-General Population** [16]. This was a measure include four dimensions were assessed: physical wellbeing, social well-being, emotional well-being, and functional well-being. The four dimensions were divided into subscales which assessed: physical wellbeing (six questions)(0-24), social well-being (six questions) (0-24), emotional well-being (five questions) (0-20) , and functional well-being (four question) (0-16). Participants are asked to rate 21 with total score(0-84). Items on a 5-point likert scale ranging from 0 = 'not at all' 4 = to 'very much' in the past week. A review of the literature examining women variable of physical, social, and emotional well-being in breast cancer patients based on nueman model components. The scores were ranged from 0 (Minimum score) to 84 (The highest score) .

III. Method

- **A written permission:** A written permission to carry out the study from responsible authorities of the oncology institute after explanation of the purpose of the study was obtained.
- **Consent :** The women's consent for participation in the study was obtained after explanation of the aim of the study and assuring that confidentiality and privacy would be maintained.
- **Tools development :** the first tool was developed by the researcher while the second tool was developed by [15] . The third tool was developed by [16] .
- **Validityof the tools:** All tools were tested for its content validity by jury of five experts in the field of three Community and Family Nursing and two Medical Surgical Nursing to ascertain relevance and completeness. Suggestion was incorporated in to the tools.
- **Reliability of the tools:** All tools were tested using test- retest methods and a person correlation coefficient formula was used. The period between each test was two weeks. It was 0.88 for the first tool, the second tool was calculated and confirmed by Cronbach's alpha 0.77 [17] . and the third tool was 0.89 [18].
- **Pilot study:** A Pilot study was conducted on 10% of women (15) to test the feasibility of the study as well as clarity and objectivity of the tools. The needed modifications were incorporated and those subjects were excluded from the actual study.
- The women who agreed to participate in the study and fulfill the inclusion criteria were selected by convenience sample then divided randomly into two equal groups, study group (1) and control group (II).
- The study group (I): women who was exposed to nursing intervention based on nueman model .
- The control group (II): received routine hospital care
- **Data collection process:** This study was conducted in 8 monthsfrom the first of January 2018 to the end of August 2018 in four consecutive phases as the following:

1- Assessment phase:-
     The researcher made initiative session to inform women about the aim and the importance of the study, to collect sociodemographic data , clinical data and to assess the women knowledge by using the first tool, assessed severity, frequency and onset of nausea and vomiting episodes using second tool and assessed physical wellbeing, social well-being, emotional well-being, and functional well-being using third tool.

2-planning phase:-
     The researcher went through extensive literature review to prepare the nursing intervention based on neuman's model for chemotherapy-induced nausea and vomiting of the study group based on needs identified in assessment phase, goals, priority of care and expected out comes were formulated and taking first inconsideration. A structured illustrative colored booklet was prepared to introduced to study group as a guide for data related to nursing interventions.
     This booklet included information about: disease process of breast cancer, chemotherapy induced nausea and vomiting, (definitions, signs and symptoms, stages, chemotherapy side effect, factors increased and decreased chemotherapy induced nausea and vomiting) and coping with stressors. Also, it had instruction about self management of life style (diet, rest, relaxation technique, breathing and coughing exercises, meditation, social, religious support and psychological support).

The booklet was written in simple Arabic language supported by illustrative pictures as a guide for illiterate women. The booklet was tested by two experts in the Medical Surgical and three Community and family nursing to check the content relevance, clarity and feasibility.

III- Implementing phase

- **The study group** was exposed to nursing intervention based on nueman model, which include theoreticaland practical part. An oral instruction as a method of teaching supported with booklet was used to introduced the theoretical part, while demonstration and redemonstration method was used for practical components.
- The researcher started to establish rapport with women and available family members.
- Each woman in the study group was interviewed individually and sometimes in group (2-5) with the researcher at the outpatient of clinical oncology department depending on women needs and environmental circumstances.
- Data collection were on Saturday , Monday and Thursday every week from 8 Am : 11.5 Am before starting chemotherapy sessions every day cases from (2:10) of chemotherapy induced nausea and vomiting patient.
- Each women was contacted for at least four sessions of 45-60 minutes depending on women's needs

1. The first session comprised of giving instruction about disease process (definition of breast cancer, signs & symptoms, stages , causes of nausea & vomiting in cancer patients, factors influencing chemotherapy induced nausea & vomiting, types of CINV, principles of nausea & vomiting control).

2. The Second session comprised of nursing intervention based on nueman model giving instruction about identifying and management of different stressors

-Physiological Stressors:- Intrapersonal: Cancer, chemotherapy planned, nausea, vomiting, pain, weight loss, compromised immune system, and new medications. **Interpersonal:** Has supportive family and friends, Good social interaction with others. Good social support system is present, works at home , religious activities, interpersonal relationship with family and children.**Extrapersonal:** Effect of situational stress (finances, home situation) on the person.
-Psychological Stressors:- Intrapersonal: Fear of future, crying. **Interpersonal:** Fear about children's future, lack of support from husband, relationship with other.**Extrapersonal:**No mention additional emotional support**.**
-**Developmental Stressors:-Intrapersonal:** Age in years.**Interpersonal:** Unmet relational intimacy needs.**Extrapersonal:** No mention of friends at same life stage.
-**Spiritual Stressors:-Intrapersonal:** Fears from illness as it was considered a punishment.**Interpersonal:** No mention of assistance in processing current situation.**Extrapersonal:** No mention ofcongregational support.
 3. **The third session**comprised of giving instructions about diet, rest, social support and psychological support). 4. **The fourth session** comprised of demonstration and redemonstration of (relaxation technique, breathing and coughing exercises, meditation) to help women to cope with stressors caused by disease or family and social problems.

- Third and fourth session were conducted two day before the second session of chemotherapy the researcher contact with study group and asked them to come to complete the nursing intervention by motivating them and establish good communication.
- At the beginning of each session the researcher had refreshed the previously given instructions then started the next session.
- Each women was allowed to ask any question and also they were advised to carry out the routine hospital care as prescribed by treating physicians.
- The women were checked for acquisition of knowledge and practice.
- The women were asked to come in the next treatment session for the follow up and to complete the planned sessions.
- Copy of booklet illustrating how to reduce CINV was given to the study group.
- Each woman was followed up by the researcher using telephone to be sure that they follow the instructions as illustrated by the researcher.
- To ensure accurate completion of the self-administered chemotherapy induced nausea and vomiting diary, each patient was contacted by telephone or in person on day 2, to remind her to fill in the diary, and on day 5.
- **The control group** received routine hospital care only.

IV-Evaluation phase
- Evaluation for study and control groups was done using all tools except first tool (part one and two) after intervention.

Statistical analysis:
- The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 19, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (χ^2). For comparison between means of two groups of parametric data of independent samples, student t-test was used. For comparison between means of two groups of non-parametric data of independent samples, Z value of Mann-whitney test was used. Significance was adopted at p<0.05 for interpretation of results of tests of significance.
- **P-value at 0.05 was used to determine significance regarding:**
- P-value > 0.05 to be statistically insignificant.
- P-value ≤ 0.05 to be statistically significant.
- P-value ≤ 0.001 to be highly statistically significant.

IV. Results

Table (I): Illustrated that the mean age of both groups was52.97±4.72, 52.80±5.06 in control and study group respectively .Regarding education about one third (38.7% , 28 %) of the control and study group respectively are read and write . 54.7% & 78.7% of the control and study group respectively were married. Regarding occupation about two thirds of the control group (73.3%) and more than half of the study group(54.7%) were housewives .The majority of both control and study group had not enough income (100.0% & 90.7% respectively).

Table (2) presented the medical data of the studied women. As presented about half of the control and the study group (49.3- 45.3% respectively) suffered from chronic disease, about one third were hypertensive (32.4% - 26.5 respectively) also, about one third were complain from peptic ulcer (29.7% - 44.1% respectively), more than one third discovered breast cancer during breast self-examination (44% - 40% respectively), as well as, about half of the control and study group were diagnosed less than one year (46.7% - 44% respectively).About half of the control and study group had localized breast cancer (45.3% - 44% respectively). Regarding type of chemotherapy used, about two third of the control and the study groupused cisplatin (72% - 64% respectively), and majority of them take once/month among control and study group (93.3% - 96% respectively).There was no statistically significant differences between study and control group regarding the mention items ,where p- > 0.05.

Table (3) showed the knowledge level scores among the studied women pre and post nursing intervention. It was observed that the Mean knowledge score was16.49±6.98 pre intervention to be an 32.85±0.48 post intervention. There was statistically significant differences between pre and post intervention among study group p- value were ≤ 0.0001

Table (4) Showedthat there was no statistically significant differences between study and control groups regarding physical ,social ,emotional and functional wellbeing before intervention .While after intervention there was statistically significant differences between study and control groups(p- value ≤ 0.0001).

Fig.(1): Showedthe occurrence of vomiting after chemotherapy among women pre and post nursing intervention, in the control group the percentage of early and late vomiting pre and post intervention are the same about one third (28%) early and about two third (72%) late .While about one third (29.3%) early vomiting pre intervention and it became nearly three quarter (73.3%) post intervention, on the other hand delayed vomiting about two third(70.7%) pre intervention and it became more than one quarter (26.7%) post intervention among study group. There was statistically significant differences between study and control groups after intervention p(≤ 0.0001)

Fig. (2): showed the frequency of nausea and vomiting among the studied women pre and post nursing intervention, there were no differences between pre and post intervention among the control group, more than half of women had nausea and vomiting 3 times/day (52.4%) pre intervention and nearly half of them (47.6%) had nausea and vomiting more than3 times/ day post intervention. While the frequency of nausea and vomiting episodes decreased post intervention than pre intervention among the study group, more than two third (68.2%), of women had nausea and vomiting more than 3 times/ day pre intervention and it became (1.8%) post intervention .There was no statistical significant difference between both groups before intervention p=0.290 while there was statistical significant differences between both groups after intervention p(≤ 0.0001)

Fig. (3) showed that the occurrence of nausea among the studied women pre and post nursing intervention, there were no differences between pre and post intervention of the control group, where more than

half (58.7%) of cases had early nausea and more than one third (41.3%) of them had delayed nausea. while the study group early nausea pre intervention was two third (61.3%) and became more than two third (69.3%) post intervention. On the other hand delayed nausea were decreased from more than one third (38.7%) pre intervention to one third (30.7%) post intervention. There was no statistical significant difference between both groups after intervention p=0.234

Fig. (4) showed that the severity of acute nausea and vomiting during 24 hours of chemotherapy among the studied women pre and post nursing intervention there were no differences between pre and post intervention among control group. While three quarter of women had severe nausea and vomiting (76%) pre intervention to became (4%) post intervention among study group. There was no statistical significant difference between both groups before intervention p=1.0001 while there was statistical significant differences between both groups after intervention p(≤ 0.003)

Fig (5) showed the severity of delayed nausea and vomiting episodes after 24 hours of chemotherapy among the studied women pre and post nursing intervention. The severity of delayed nausea and vomiting episodes were mainly decreased from more than three quarter (87%) had severe nausea and vomiting pre intervention to (0%) post intervention, and it became more than three quarter (87%) mild among the study group. There was no statistical significant difference between both groups before intervention p=0.217 while there was statistical significant differences between both groups after intervention p(≤ 0.0001)

Fig (6) showed the onset of acute nausea and vomiting during 24 hours after chemotherapy among the studied women pre and post nursing intervention. Among control group, It was the same result pre and post intervention. About one third occurred in the morning (34.1%), more than one third occurred in the evening (40.9%) and about one quarter (25%) occurred continuously. While among the study group , more than one third (33%) occurred in the morning pre intervention to became two third (61.5%) post intervention, and more than one third (40%) occurred continuously to became zero post intervention. There was statistical significant differences between pre and post nursing intervention among study group p(≤ 0.005)

Figure (7) showed that the onset of delayed nausea and vomiting after 24 hours after chemotherapy among the studied women pre and post nursing intervention. There were no difference between pre and post intervention among control group nearly three quarter (74.2%) had nausea and vomiting episodes occurred in the morning and (9.7%) continuously. While more than half of women had nausea and vomiting episodes (51.6%) occurred continuously pre intervention to no one post intervention with more than two third (65.5%) in the morning among the study group. There was no statistical significant difference between both groups after intervention p=0.795

Table (1): Distribution of socio-demographic data of the studied women (N=150).

Socio-demographic data	The studied women with breast cancer (No.=150)			
	Control group (N=75)		Study group (N=75)	
	No.	%	No.	%
●**Age years:**				
45 <50	20	27	22	29.3
50-<55	22	29.3	18	24.0
55-<60	25	33	30	40.0
60-65	8	10.7	5	6.7
Range Mean±SD	45.00-65.00 52.97±4.72		45.00-65.00 52.80±5.06	
t-test P	0.316 0.752			
●**Marital status:**				
Single	11	14.6	6	8.0
Married	41	54.7	59	78.7
Widow	15	20.0	10	13.3
Divorced	8	10.7	0	0
●**Educational level:**				
Illiterate	26	34.6	17	22.7
Read and write	29	38.7	21	28.0
Secondary education	5	6.7	25	33.3
High education	15	20.0	12	16.0
●**Occupation:**				
House wife	55	73.3	41	54.7
Worker	20	26.7	34	45.3
●**Family income:**				

Enough	0	0	7	9.3
Not enough	75	100	68	90.7

Table (2): Distribution of medical data among the studied women (N=150).

Variables	The studied women with breast cancer (No.=150)				χ2 P
	Control group (N=75)		Study group (N=75)		
	No.	%	No.	%	
●**Suffer from chronic disease:**					
Yes	37	49.3	34	45.3	0.241
No	38	50.7	41	54.7	0.624
-**Type of disease:**					
Hypertension	12	32.4	9	26.5	2.491
Diabetes mellitus	6	16.3	6	17.6	2.521
Peptic ulcer	11	29.7	15	44. 1	
Other	8	21.6	4	11.8	
●**How the woman discovered breast cancer:**					
During breast self-examination	33	44.0	30	40.0	0.300 0.827
By mammography	14	18.7	14	18.7	
By manifestations	28	37.3	31	41.3	
●**Duration of breast cancer diagnosis (years):**					
<1	35	46.7	33	44.0	0.890
1-3	36	44.0	35	46.7	0.640
>3	4	9.3	7	9.3	
●**Breast cancer stage:**					
Localized in breast	34	45.3	33	44.0	0.130
Breast and lymph nodes	30	40.0	32	42.6	0.938
Metastasis	11	14.7	10	13.4	
●**Type of chemotherapy used:**					
Cisplatin	54	72.0	48	64.0	1.180
Endocasan	14	18.7	19	25.3	0.555
Combination of both	7	9.3	8	10.7	
●**Frequency of used chemotherapy:**					
Once/month	70	93.3	72	96.0	0.530
Twice/month	5	6.7	3	4.0	0.467

Table (3) Knowledge level of the studied women (the study group) pre and post nursing intervention (No.=75).

| Total knowledge	The studied women (the study group) (No.=75)				χ²	P
	Pre-intervention		Post-intervention			
	No.	%	No.	%		
▪**Grades of total knowledge:**						
Poor	53	70.5	0	0	110.561	0.0001*
Moderate	15	20	15	20		
High	7	9.5	60	80		
▪**Scores of total knowledge:**						
Range **Mean±SD**	5-32 16.49±6.98		31-34 32.85±0.48			
Paired t-test **P**	18.392 0.0001*					

Table (4): Total response of the four dimensions of Functional Assessment of Cancer Therapy-General Population (FACT-GP) among the studied women pre and post nursing intervention (No.=150).

Dimensions of FACT-GP		The studied women with breast cancer (No.=150)										P
		Not at all		A little bit		Sometimes		Quite a bit		Very much		
		N	%	N.	%	No.	%	No.	%	No	%	
Total physical well being												
Control group	Pre-intervention	0	0	0	0	13	17.3	28	37.3	34	45.3	1.0001
	Post-intervention	8	10.7	41	54.7	22	29.3	1	1.3	3	4.0	
Study group	Pre-intervention	0	0	0	0	0	0	36	48.0	39	52.0	0.0001*
	Post-intervention	20	26.7	38	46.7	15	24.0	2	2.7	0	0	

χ^2 (P)	Pre	14.350 (1.0008)										
	Post	9.910 (0.042*)										
Total social wellbeing												
Control group	Pre-intervention	25	33.3	11	14.7	20	26.7	15	20.0	4	5.3	1.001
	Post-intervention	12	16.0	14	18.7	8	10.7	31	41.3	10	13.3	
Study group	Pre-intervention	29	38.7	12	16.0	13	17.3	14	18.7	7	9.3	0.0001*
	Post-intervention	2	2.7	9	12.0	7	9.3	21	28.0	36	48.0	
χ^2 (P)	Pre	2.680 (0.613)										
	Post	24.920 (0.0001*)										
Total emotional wellbeing												
Control group	Pre-intervention	3	4.0	9	12.0	18	24.0	27	36.0	18	24.0	2.002
	Post-intervention	13	17.3	20	26.7	18	24.0	13	17.3	11	14.7	
Study group	Pre-intervention	6	8.0	8	10.7	19	25.3	17	22.7	25	33.3	0.0001*
	Post-intervention	22	29.3	20	26.7	13	17.3	12	16.0	8	10.7	
χ^2 (P)	Pre	4.500 (0.345)										
	Post	3.630 (0.0001) *										
Total functional well being												
Control group	Pre-intervention	10	13.3	19	25.3	37	49.3	9	12.0	0	0	1.000
	Post-intervention	10	13.3	19	25.3	37	49.3	9	12.0	0	0	
Study group	Pre-intervention	39	52.0	29	38.7	7	9.3	0	0	0	0	0.0001*
	Post-intervention	0	0	1	1.3	36	48.0	38	50.7	0	0	
χ^2 (P)	Pre	48.700 (0.513)										
	Post	44.110 (0.0001*)										

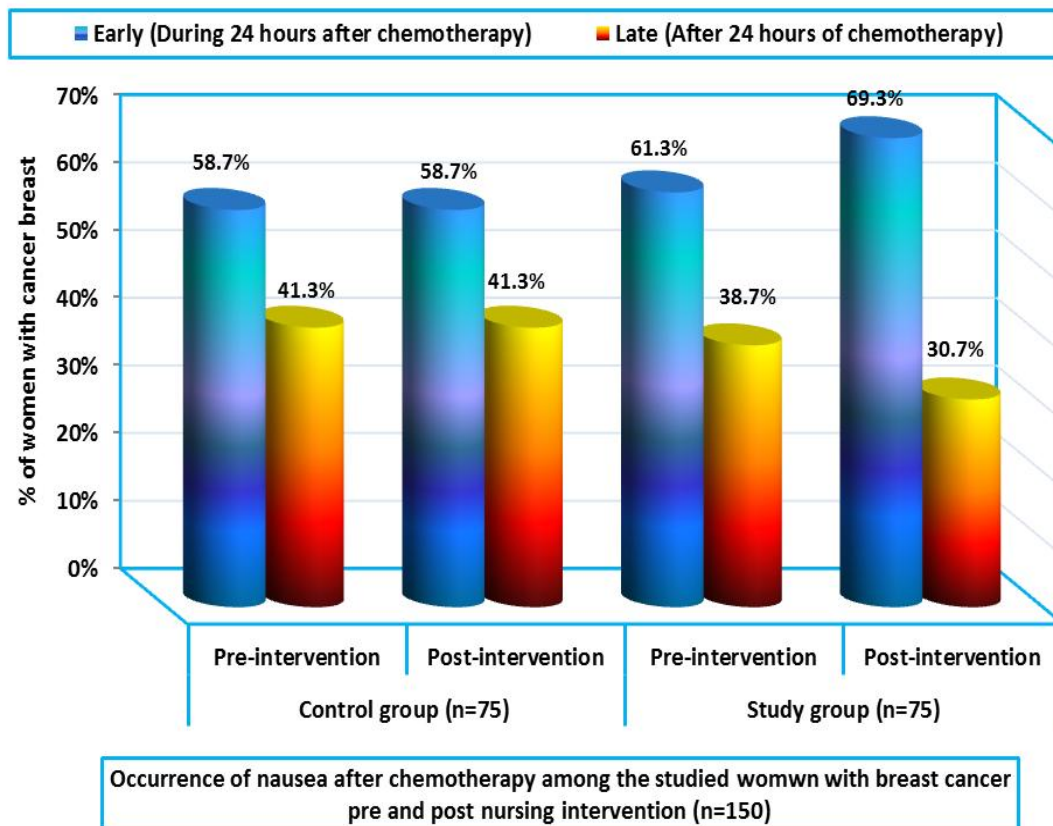**Figure (1):** Occurrence of vomiting among the studied women pre and post nursing intervention (N=150).

Occurrence of vomiting after chemotherapy among the studied women with breast cancer pre and post nursing intervention (n=150)
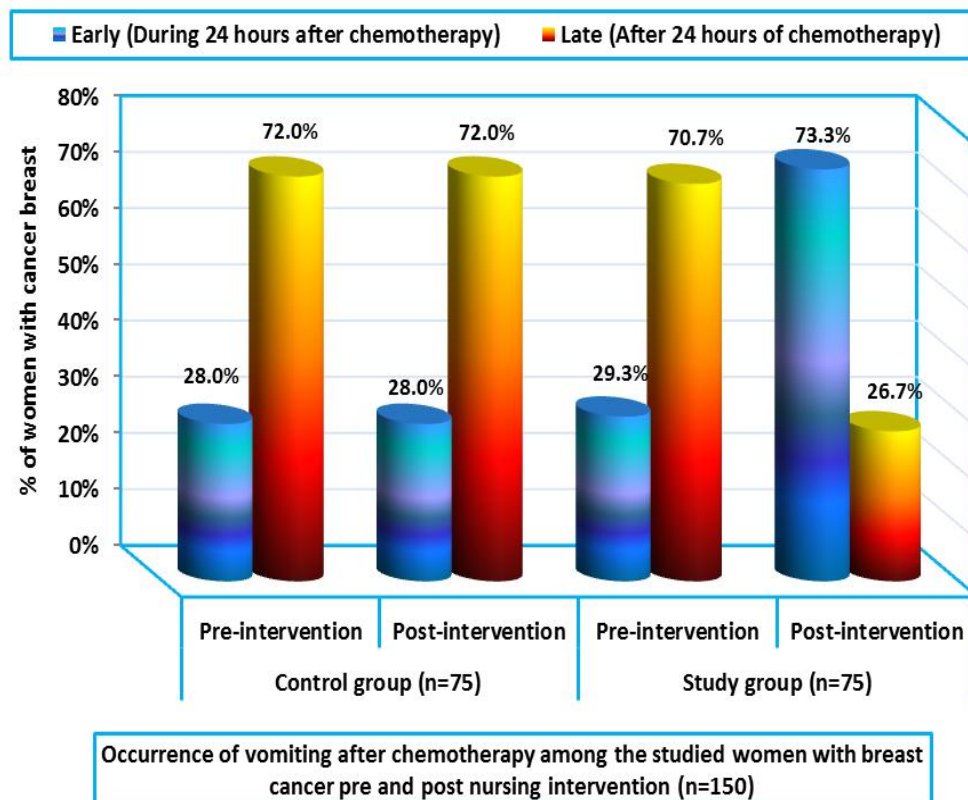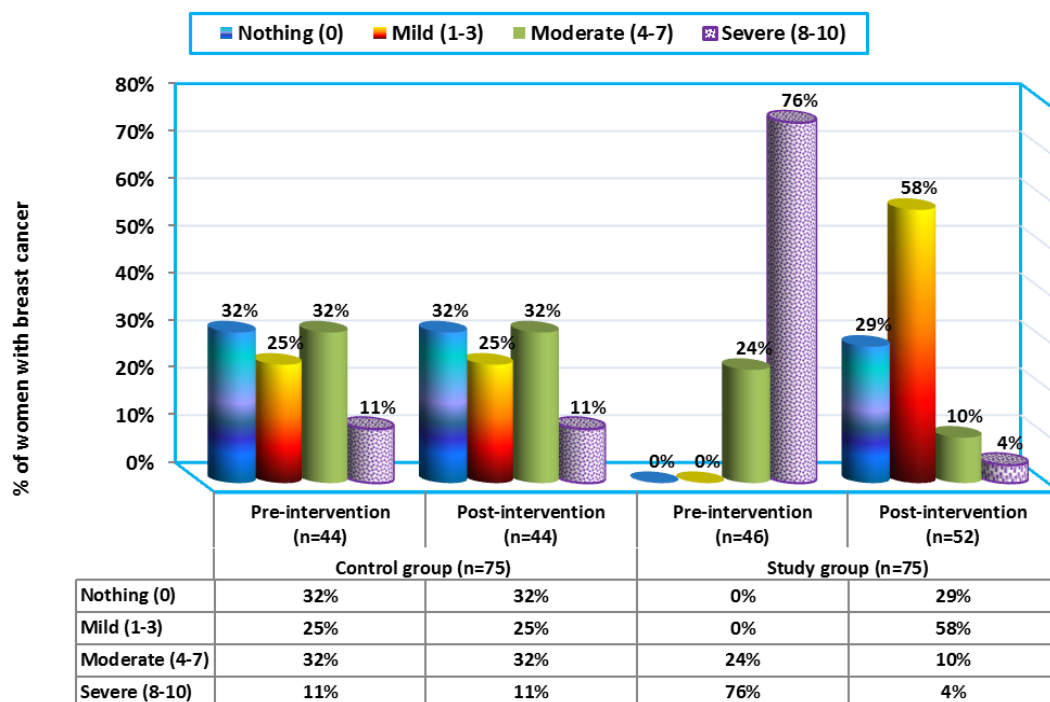
Figure (2): Frequency of nausea and vomiting during 24 hours immediately after chemotherapy among the studied women pre and post nursing intervention (n=150).

Frequency of vomiting during 24 hours after chemotherapy among the studied women pre and post nursing intervention (n=150)
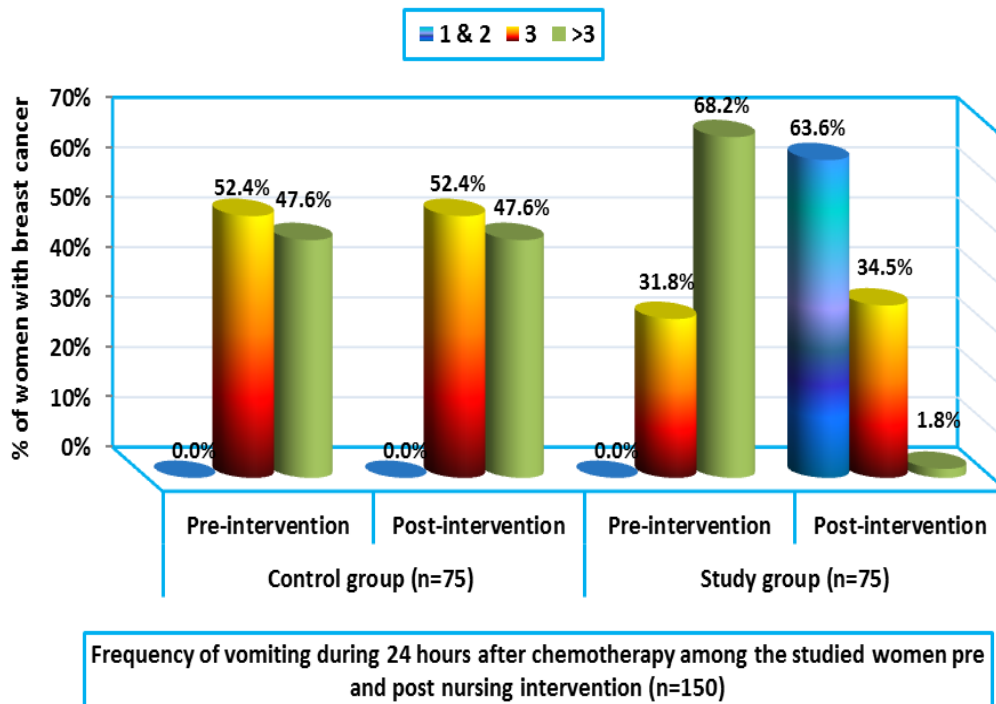
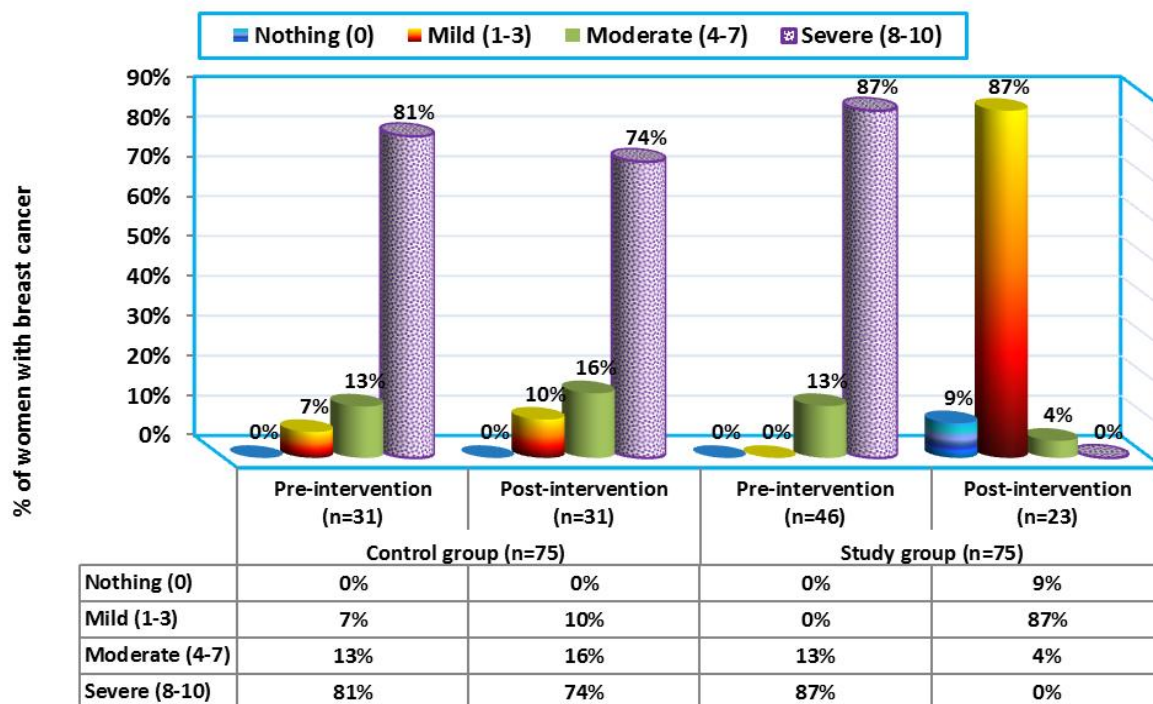**Figure (3):** Occurrence of nausea among the studied women pre and post nursing intervention (N=150).

Occurrence of nausea after chemotherapy among the studied womwn with breast cancer pre and post nursing intervention (n=150)

Figure (4): Severity of nausea and vomiting during 24 hours of chemotherapy among the studied women pre and post nursing intervention (N=150).
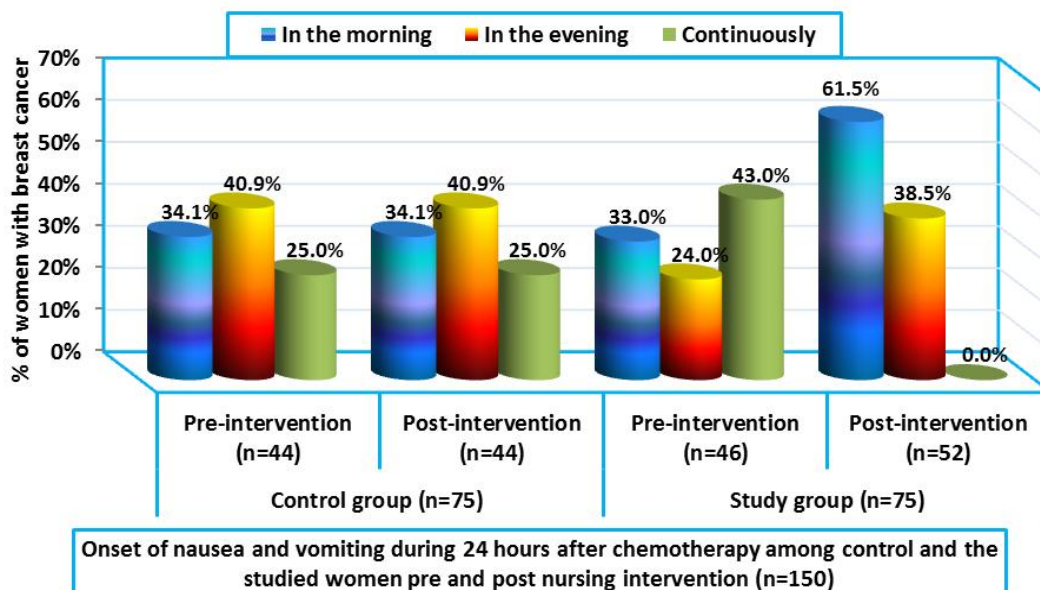

|	Pre-intervention (n=44)	Post-intervention (n=44)	Pre-intervention (n=46)	Post-intervention (n=52)
	Control group (n=75)		Study group (n=75)	
Nothing (0)	32%	32%	0%	29%
Mild (1-3)	25%	25%	0%	58%
Moderate (4-7)	32%	32%	24%	10%
Severe (8-10)	11%	11%	76%	4%

Severity of nausea during 24 hours after chemotherapy among the studied women pre and post nursing intervention (n=150)

Figure (5): Severity ofdelayed nausea and vomiting after 24 hours of chemotherapy among the studied women pre and post nursing intervention (N=150).

	Pre-intervention (n=31)	Post-intervention (n=31)	Pre-intervention (n=46)	Post-intervention (n=23)
	Control group (n=75)		Study group (n=75)	
Nothing (0)	0%	0%	0%	9%
Mild (1-3)	7%	10%	0%	87%
Moderate (4-7)	13%	16%	13%	4%
Severe (8-10)	81%	74%	87%	0%

Severity of nausea after 24 hours after chemotherapy among the studied women pre and post nursing intervention (n=150)

Figure (6): Onset of nausea and vomiting during 24 hours after chemotherapy among the studied women pre and post nursing intervention (N=150).

Figure (7): Onset of nausea and vomiting after 24 hours after chemotherapy among the studied women pre and post nursing intervention (N=150).
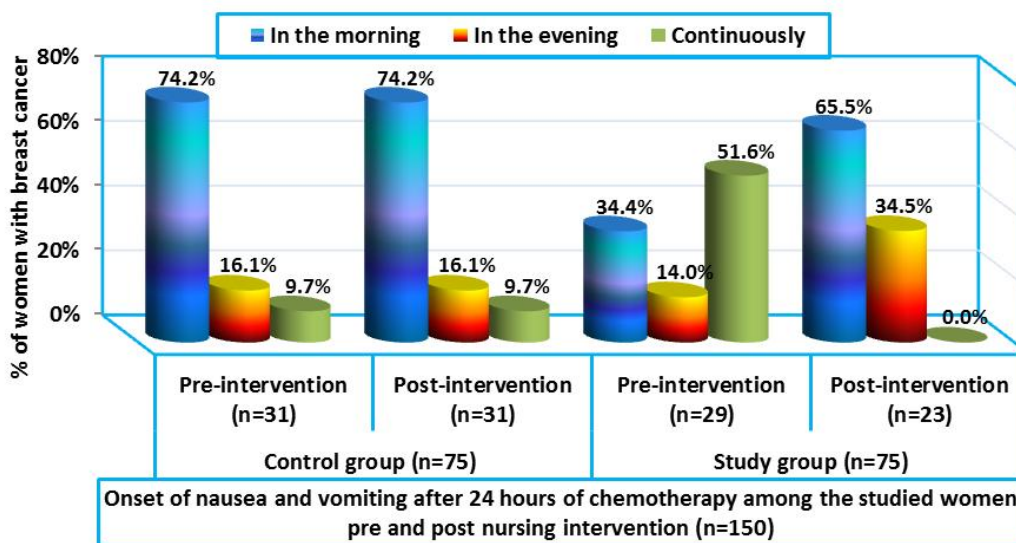
V. Discussion

Chemotherapy Induced Nausea and Vomiting (CINV) is among the most intensive side effects and critical concerns for patients with cancer. Nurses providing holistic care to women with breast cancer is very important and it can be achieved with the use of nursing models. The aim of this study was to identify the effectiveness ofnursing intervention based on neuman's model for chemotherapy-induced nausea and vomiting among women with breast cancer.

Regardingage,the findings of the current study revealed that the mean age for control and study group was 52.97±4.72 and 52.80±5.06 years respectively. This finding is going withAbd-Elalem, (2008) [19] who reported that the majority of age group for both study and control group were ranged from 45 to 65 years old.On the contrary withAbdel-Aziz, (2008) [20] who noted that more than half of cancer cases were diagnosed after the age of 65 years.

Regarding to educational level, the present study found that about one third of both study and control groupsare read and write. This was consistent withHussien, (2007) [21] who reported that about one third of the

both studied group read and write. But these results on the contrary with El- Badawy, (2016) [22] who reported that the patients in their studies were illiterate.

Moreover, the findings of this study approved that about two third of studiedwomen were house wife. This result is supported byHamed, (2013) [23] who stressed that the highest percentage of the patients were house wife. WhileSallam, (2012) [24] reported that about two third of breast cancer women among worker women.

As regard to income the findings of the current study approved that the majority of study and control group hadn't enough income which consistent withFeng& Li. (2013)[25] who revealed that they were generally low socioeconomic backgrounds with relatively low income among study and control group, low socioeconomic status is also negatively correlated with health-related quality of life among the cancer patients.

Regarding to chronic disease, the present study revealed that nearly half of the study and the control group were suffer from chronic diseases mainly peptic ulcerthe result consistent withTurini, Piovesana , Ruffo, et al. (2015)[14] who reported that about more than one third of the studied group had chronic diseases, quarter of them suffered from GIT disorder.

The present study results revealed thatmore than one third of the studied sample discovered breast cancer during breast self examination. The results consistent withStatistics of the Surveillance (2015)[26] who conducted research offive-year relation of comparative survival rate ofpatient with localized breast cancer discovered by breast self examination diagnosed less than one year, While it was only one third of patientswith advanced disease discovered by mammography.

The present study results revealed that about half of studied group had localized breast cancer diagnosed less than one year. This in the line withStatistics of the Surveillance (2015) [26] they revealed that, among five-year relation of comparative survival rate of a patient with localized breast cancer is 86.2%, while it is only 23.8% in patients with advanced disease discovered by breast self-examination, and mammography less than one year of diagnosis.

Regarding type of chemotherapy, about two third of the study and control group used cisplatin,the current study results consistent withGeling&Eicher ,(2015)[27]who explained that oncologists usually prescribed cisplatin for breast cancerpatients as line for management for its rapid action and controlling of cancer cells.

Related to the knowledge level scores among the studied women pre and post nursing intervention. The present study observed that the mean knowledge score was16.49±6.98 pre intervention to be an 32.85±0.48 post intervention. There was statistically significant differences between pre and post intervention among study group p- value were ≤ 0.0001.Moreover, the results of the current study was consistent withDibble, & et al, (2000) [28] &Roila, Ballatori, Ruggeri, et al.,(2010) [29] the researchersstated that the majority of studied group had low score (poor) knowledge pre nursing intervention and majority of them had good knowledge post intervention.This results related to effective nursing intervention that improved knowledge and practices among patient who CINV.

Regarding physical, social, emotional and functional wellbeing , there was statistically significant differences between study and control groups(p- value   ≤ 0.0001) post intervention.This may be due to improvement of knowledge and following the instruction given about relaxation technique,meditation and diet. The result consistent withBošnjak et.al.,(2010)[30] who reported that patients who vomited after chemotherapy reported significantly more impact on physical, social and emotional functioning, global QOL.Patient satisfaction with antiemetic treatment also has been related significantly to psychological distress, physical symptom distress, activity level, and control of nausea and vomiting.Clinicians should consider employing additional interventions (including combined pharmacological and non-pharmacological approaches) in attempts to improve management for their patient. Also, this results was supported by Borjeson, Hursti, Tishelman& Peterson(2002) [31]&Williams &Schreier, (2004)[32] who documented that a reduction in nausea and an improvement in well-being occurred afterincreased support and education of the womenby providing verbal, written, and audio taped information . Buffart et.al., (2012) [33] showed that yoga has strong beneficial effects on distress, anxiety and depression, moderate effects on fatigue, general HRQoL, emotional function and social function, small effects on functional well-being, and no significant effects on physical function and sleep disturbances.Buffart et.al., (2012) [33] stated that when the patient became aware of the impact of stress on the progress of her disease, she was determined to reduce the amount of stress in her life. Her family was also consulted and asked to put family tensions aside to help her.

Regarding to the occurrence of nausea and vomiting the present study revealed that there was statistically significant differences between study and control groups after intervention. This results consistent withGenc, & Tan, (2014)[34] who reported that the mean nausea and vomiting experience score for patients in the experimental group over the five days of acupressure application was significantly lower ($p<0.05$) versus those for patients in the control group.Moreover , Borjeson, Hursti, Tishelman& Peterson(2002) [31] presented interesting data on breast cancer patients receiving chemotherapy who were randomized to receive acupressure

or placebo. The researchers studied women on their second or third cycle of therapy and randomized to receive acupressure to P6 point (active), acupressure to the usual care only. The subjects kept a daily log for 3 weeks. Although no significant differences were found in acute CINV or emesis in any of the treatment groups, the acupressure intervention in the delayed CINV group had a statistically significant reduction in the occurrence of vomiting and nausea, compared with the placebo and usual-care groups.

Regarding to frequency of nausea and vomiting there were no statistical difference between both groups before intervention ,while there was highly statistical significant differences among the studied group after interventionp(≤ 0.0001)the study results in the same line withKaragozoglu, Tekyasar, &Yilmaz, (2013) [35] who studied the effect of music therapy and guided imagery on reducing frequency of chemotherapy induced nausea and vomiting also, the results consistentwithMolassiotis, Russell, Hughes, Breckons, et al., (2014) [36] all researchers discovered that these distraction techniques had a positive correlation in reducing CINV as compared to patients in the control group who only used pharmacological methods to reduce CINV and routine hospital care.Also Hosseini etal.,(2016)[37] stated that after the intervention, patients at the third session of chemotherapy had significantly lower mean scores in the frequency and severity of nausea and vomiting pre and post chemotherapy ($p < 0.05$).

Regarding to the onset of delayed nausea and vomiting after 24 hours of chemotherapy. There were no difference between pre and post intervention among control group, nearly three quarter had nausea and vomiting episodes occurred in the morning. While more than half of women had nausea and vomiting episodes occurred continuously pre intervention to become zero post intervention among the study group.This may be due to using of nutritional instruction and effective nursing intervention based on model. The results consistent withBooth, et al.(2016)[38].who found a significantly reduced in women had nausea and vomiting episodes post intervention among the experimental groups. However, chemotherapy-induced nausea and vomiting was only reduced in the groups who participated in effective nursing interventions moreover the researcher reported that nurse-patient counseling resulted in the lowest number of CINV episodes.

Related to severity of nausea and vomiting episodes, the present study revealed thatthere were no differences between pre and post intervention among control group. While three quarter of women had severe nausea and vomiting pre intervention to became less than five percent post intervention among study group. There was no statistical significant difference between both groups before intervention p=1.0001 while there was statistical significant differences between both groups after intervention p(≤ 0.003).This may be due to identifying the stressors, providing support and education. The researcher give verbal and written, information to women .The study results consistent withViswanathan and Eisenberg,(2006)[39]who said that 25 min instruction of relaxation using audio tape was effective in reducing the intensity of delayed nausea and vomiting in patients with cancer.Usharani, et al, (2012)[40] proved that yoga had a significant effect on decreasing severity of CINVepisodes. In particular, there were significant differences among study group post intervention than pre intervention in decreasing severity of CINV episodes related to effective nursing intervention. Also Hosseini,etal(2016)[37] stated that after the intervention, patients at the third session of chemotherapy had significantly lower mean scores in the frequency and severity of nausea and vomiting pre and post chemotherapy ($p < 0.05$).

Using of nursing instruction based on Neuman model for decreasing CINV, Since drugs did not treat nausea and vomiting completely, such as ginger, acupuncture, acupressure, relaxation , guiding visualization, Yoga and aerobic exercises besides pharmacotherapy for controlling the predicted, acute and delayed phases for decreasing CINV [41]. The results also consistent withGreenlee, et al.,(2014)[42] who specified some non-pharmacological strategy interventions and nursing care such as acupuncture, acupressure, aromatherapy, providing educational and supportive information, exercises, guiding visualization, ginger and music therapy as an instruction for patients. Also, the results was consistent withGrunberg, Chua, Maru, et al., (2011) [43]who reported that comprehensive psychological supportive care reinforces needs related to information provided, management of daily life activities, emotions and sexuality. Also the result consistent withRodgers, et al., (2012)[44] who studied conventional anti-emetics interventions as successful measures in preventing emesis and nausea such as acupressure, electro-acupuncture, ginger, prognostic muscle relaxation, or self-management strategies that introduced to patient to improve their knowledge and practices.

VI. Conclusions

The results of this study conclude that women who received nursing intervention based on neuman's model study group had less episodes of frequency, onset and severity of nausea and vomiting as compared with the control group.There was an improvement of physical ,social ,emotional and functional well being among study group as compared with control group. There was an improvement of knowledge among study group as compared with control group

VII. Recommendation

- Copies of booklet of nursing intervention based on Neuman's model for chemotherapy-induced nausea and vomiting should be available in chemotherapy units for breast cancer patients and their families with a given instruction from nurses or other health professionals.
- Further study of application of Neuman's model for chemotherapy-induced nausea and vomiting should be carried out in a large number of cases and at different setting.
- The model can be used as a framework to help nurses care for patients. Thus, the application of this model and other models is recommended in the nursing care of patients.

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