

## Factors affecting Adherence to Adjuvant Hormonal Therapy among Women with Breast Cancer

Amany Refaat Elmaadawy <sup>(1)</sup>, Manal Salah Hassan <sup>(2)</sup>, Yosreah Mohamed Mohamed <sup>(3)</sup>,  
Diaa Eldin Moussa Sherif <sup>(4)</sup>

<sup>(1)</sup> Demonstrator in Medical Surgical Nursing Department, Faculty of Nursing Ain Shams University

<sup>(2)</sup> Professor of Medical Surgical Nursing, Faculty of Nursing, Ain Shams University.

<sup>(3)</sup> Assistant Professor of Medical Surgical Nursing, Faculty of Nursing, Ain Shams University.

<sup>(4)</sup> Lecturer at oncology and nuclear medicine, Faculty of medicine Ain shams university.

### Abstract

**Background:** Breast cancer is the most common cancer in women worldwide. Also, is the leading cause of death in women, Adjuvant endocrine therapy is a treatment that significantly reduces recurrence and mortality in women with hormone receptor-positive breast cancer. **Aim of the study:** Assess factors affecting adherence to adjuvant hormonal therapy among women with breast cancer. **Study Design:** A descriptive design was used to achieve the aim of this study. **Setting:** Oncology center and nuclear medicine affiliated to Ain shams university hospitals. **Subjects:** A purposive sample of 60 women diagnosed with breast cancer and treated with hormonal therapy. **Data Collection:** tool I) Structured Interview Questionnaire for Women with Breast Cancer on Hormonal Therapy, which is divided into 3 parts- Part 1: Socio-demographic Data of studied Women. Part 2: Medical Health Profile. Part 3: Knowledge Regarding to Breast Cancer and Hormonal Therapy. Tool II) the morisky medication adherence scale. Tool III) factors affecting adherence to adjuvant hormonal therapy among women with breast cancer. **Result:** less than two thirds of the studied women had unsatisfactory level of total knowledge about breast cancer and hormonal therapy. Less than half of them had high level of adherence. Less than three quarters of them had sever physical symptoms and fatigue, more than two thirds of them had sever pain, half of them had sever depression, half of them had low self-efficacy, more than two thirds of them had severe stress and less than three quarters of them had high level of social support. **Conclusion:** Near two thirds of women had unsatisfactory level of total knowledge about breast cancer and hormonal therapy. Less than half of them had high level of medication adherence. The Study had identified several factors that are associated with non-adherence to adjuvant hormonal therapy; these factors include side-effects of treatment especially musculoskeletal pain, fatigue, knowledge, forgetfulness, beliefs, depressive symptoms, attitudes, and self-efficacy. **Recommendations:** Educational programs should be planned to encourage women to adhere to medication. Also, Women need a simplified and comprehensive Arabic booklet including information about the medication. In addition, Replication of the current study on a larger probability sample is recommended to achieve generalization of the results.

**Keywords:** Breast cancer, Hormonal therapy, Adherence, factors affecting

### Introduction:

Breast cancer is a disease in which cells in the breast grow out of control. There are different kinds of breast cancer. The kind of breast cancer depends on which cells in the breast turn into cancer. Among women breast cancer is the most common malignant disease worldwide, accounting for 24% of new cancer cases and 15% of cancer deaths in 2018 and incident cases are expected to increase by more than 46% by 2040, according to the Globocan

Cancer Tomorrow prediction tool (*Heer et al., 2020*). In Egypt, breast cancer comprises the most common of all cancer types in females; with 28,000 confirmed cases each year as reported by the National Cancer Institute (NCI), Egypt. While the incidence in Egypt seems to be slightly lower than the corresponding rates in the USA and other Western societies, Egyptian breast cancer patients are characterized by higher mortality rate, Developing countries like Egypt are experiencing higher than ever incidence rates. That could be attributed to

aging of population, the current recommendations enacted by the WHO are to commence screening to women at early ages in the hope of an early detection to reduce such mortality rates and minimize the burden of breast cancer (*Saleh, et al., 2021*). Adjuvant endocrine therapy improves the prognosis of women with hormone receptor-positive breast cancer. A meta-analysis of patients with early breast cancer showed that 5 years of tamoxifen decreased the 15-year risk of recurrence and breast cancer mortality by 39% and 30%, respectively. Moreover, aromatase inhibitors decreased the 10-year breast cancer mortality by about 15% compared with 5 years of tamoxifen. Despite the proven efficacy of endocrine therapy, some patients find it difficult to continue the treatment for 5 years (*Kuba et al., 2018*).

Adherence is defined as ‘the extent to which a person’s behaviour corresponds with agreed recommendations from a health care provider’. According to guidelines, endocrine therapy (ET) as adjuvant treatment for breast cancer should be taken for at least 5 years with studies showing even better results when used for 10 years (*AlOmeir et al., 2020*).

Non-adherence to ET is defined as not taking the medication for periods, or to stop taking the medication all together before 5 years has passed. Women who adhere to ET less than fully period show reduced survival compared to women who follow the recommended regime (*Hagen et al., 2019*).

Multiple systematic reviews had identified several potentially modifiable factors associated with AET adherence in breast cancer survivors. Such as identified medication side effects, self-efficacy, social support, relationship with healthcare providers, forgetfulness and knowledge of cancer as associated with AET adherence. Also, social support, positive decisional balance, beliefs about medications, depressive symptoms (*Toivonen et al., 2021*).

### **Significance of the study:**

BC is the most common type of cancer in Egypt for women, accounting for 38.8% of cancers in this population, with the estimated number of breast cancer cases nearly 22,700 in 2020 and forecasted to be approximately 46,000 in 2050 (*Alorabi & Elghazawy, 2021*). Adjuvant HT is a treatment that significantly reduces recurrence and mortality in women with hormone receptor-positive BC. The most commonly prescribed adjuvant HT are tamoxifen and AIs. Women who are non-adherent to or non-persistent with adjuvant hormonal therapy have a dramatic increase in their risk of mortality (*Cavazza et al., 2020*).

Recent reviews of global studies had identified several factors that are associated with non-adherence to AET. These factors include personal demographic factors; side-effects and quality of life; knowledge of cancer, forgetfulness, beliefs, depressive symptoms and attitudes; socio-behavioral factors like self-efficacy (the belief in one’s own capacity to achieve a health goal through behavior modification); and structural health-system factor (healthcare provider relationship) and social support (*Fadelu et al., 2022*).

All this factors make patient adherence difficult. The nurse should encourage women’s to be involved in developing their treatment plan, through this participation women’s assume responsibility for implementing the plan and the chance for adherence to medication will increase, also this participation will help the nurse to monitor the good and bad effect of medication and encourage the women’s to report the un expected effects to their doctor.

This study aimed to identify the factors associated with adherence to hormone therapy for breast cancer, with the goal of contributing to the reformulation of the care process and to improvements in treatment outcomes.

**Aim of the study:**

Assess Factors affecting adherence to adjuvant hormonal therapy among women with breast cancer through the following:

1. Assess Adherence to adjuvant hormonal therapy among women with breast cancer.
2. Assess factors affecting adherence to adjuvant hormonal therapy among women with breast cancer.

**Research questions:**

**Q1-** Are the women with breast cancer adhere to adjuvant hormonal therapy?

**Q2-** What are the factors affecting adherence to adjuvant hormonal therapy among women with breast cancer?

**Research Design:**

A descriptive exploratory research design was utilized to carry out the current study. This design was concerned with description of phenomenon of interested focuses on a single group or population characteristics without trying to make interference (*Leavy, 2017*).

Exploratory research is defined as a research used to investigate a problem which is not clearly defined it is conducted to have a better understanding of the existing problem, but will not provide conclusive results (*Abramson et al., 2018*).

**Subjects and Methods**

Based on retrospective statistical data, the number of women with breast cancer that admitted to the oncology and nuclear medicine center affiliated to Ain Shams University Hospitals during the year 2019 and received adjuvant hormonal therapy was 450 women, so a purposive representative sample were be 60 women.

The sample size calculation done based on power analysis:

- Type I error with significant level ( $\alpha$ )=0.5
- Type II error by power test (1-B) = 90%
- Found the minimum sample (60).

**Inclusion criteria:**

- Female aged 18 or older.
- Diagnosed with primary breast cancer (stage 0-111).
- Eligible to receive AHT (tamoxifen or an aromatase inhibitor) for the first time.
- Completed the primary treatment (surgery, chemotherapy, end radiotherapy session or still taking it).

**Setting:**

The study was conducted in the outpatient breast clinic at Oncology Center and Nuclear Medicine affiliated to Ain Shams University Hospitals, it was on the ground floor and it consisted of two rooms, one room contained a bed, an office, three chairs and a bathroom , the another room contained two offices, a bed with curtain, six chairs, weight and height measurement scales. The outpatient breast clinic received women daily except Monday and Tuesday.

**Tools for data collection:**

The data will be collected using the following tools:

**I- Structured Interview Questionnaire for Women with Breast Cancer on Hormonal Therapy**, it was developed by the researcher in Arabic language after reviewing the recent related literatures and it includes the following parts:

**Part 1: Socio-demographic Data of Women with Breast Cancer:**

It was used to assess women's age, occupation, marital status, level of education, income, the house condition, residence, treatment costs and number of family member.

**Part 2: Medical Health Profile of Women with Breast Cancer:**

This part was developed by the researcher based on review of relevant literature (*El-Feqi et al., 2020*), (*Timby et al., 2014*) It was used to collect data about women's history which include present medical history of the disease, past and family health history, menstrual history, treatment regimen and hormonal therapy history.

### Part 3: Knowledge Regarding to Breast Cancer and Hormonal Therapy:

This part was developed by the researcher based on review of relevant literature (*El-Feqi et al., 2020; Alomeir et al., 2020; American Cancer Society, 2015; Timby et al., (2014)*) it included the following items: The disease nature, definition, causes, signs and symptoms, treatment, diagnostic procedures, risk factors, prevention behavior, stages or grades of disease, hormone therapy forms, action of treatment, side effect and indication of treatment.

#### ❖ Scoring system:

The scale was contained of 32 questions, the total scores of the questionnaire were 0-32 grades, the right answer was scored as a single point and the wrong answer was scored as a zero point. These scores were summed up and were converted into a percent score. It was classified into 2 categories:

- **Satisfactory** knowledge if score was  $\geq 70\%$ .
- **Unsatisfactory** knowledge if score was  $< 70\%$ .

### II- The Morisky Medication Adherence Scale (MMAS-8).

This tool was adopted from *Morisky et al. (1986)* to assess medication adherence of patient with breast cancer receiving hormonal therapy.

#### ❖ Scoring system:

The Morisky scale contains eight questions to evaluate forgetfulness, understanding of the need for continued therapy; the first seven questions (1-7) categorized as 'yes' (1) or 'no' (0) response, while for the last question (8) consists of a five – point rating scale from never/ rarely (0), once in a while (1), sometimes (2), usually (3) and all the time (4) total score was interpreted as  $> 2$  =low adherence 1 or 2 = moderate adherence 0 = high adherence

### III- Factors Affecting Adherence to Adjuvant Hormonal Therapy among Women with Breast Cancer

It included the following parts:

#### 1) Treatment Related Factors:

- **The Breast Cancer Prevention Trial Symptom Checklist:** It measure a list of 42 physical and cognitive symptoms associated with the treatment divided into 6 items cognitive and 36 items physical, distributed to (Musculoskeletal pain 5 items, Vasomotor symptoms four items, Gastrointestinal symptoms three items, Dyspareunia two items, Bladder control two items, Weight concerns four items, Gynecologic symptoms three items, Other physical symptoms 13 items) that are commonly reported among women on cancer treatment or prevention trials. This tool was adopted from *Cella et al., (2008)*.

#### ❖ Scoring system:

The scale included of 42 items. Each item has 5-point choice rating from 1= "Not at all" to 5" Extremely ". The total scores of the scale were 42-210 grades. These scores were summed and were converted into a percent score. It was classified into 3 categories:

- **Mild** symptoms if score  $< 50\%$ .
- **Moderate** symptoms if score from 50 %-< 75%.
- **Severe** symptoms if score from  $\geq 75\%$ .

#### 2) Patient Related Factors:

▪ **Pain interference:** Brief Pain Inventory (BPI)-Interference subscale, measures how much pain has interfered with 7 daily activities, including general activity, walking, work, mood, enjoyment of life, relations with others, and sleep. This tool was adopted from *Cleeland, (1989)*.

#### ❖ Scoring system:

The scale was consisted of 7 items. Each item has 0-10-point choice rating from 0= "Does not Interfere "to 10 " Completely Interferes". The total scores of the scale were 0- 70 grades. These scores were summed and were converted into a percent score. It was classified into 3 categories:

- **Mild** pain if score  $< 50\%$ .
- **Moderate** pain if score from 50%-<75%.
- **Sever** pain if score from  $\geq 75\%$ .

▪ **Depression:** center for epidemiologic studies depression CES-D Scale, self-reported depression scale includes 20-items comprising

six scales reflecting major facets of depression: depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, and sleep disturbance. This tool adopted from *Radloff et al., (1977)*.

❖ **Scoring system:**

Each item has 4-point choice rating from 0= "Rarely" to 3 "Most". The total scores of the scale were 0-60 grades. These scores were summed and were converted into a percent score. It was classified into 3 categories:

- **Mild** depression if score < 50%.
- **Moderate** depression if score from 50%-<75%.
- **Severe** depression if score from  $\geq 75\%$ .

▪ **Self-efficacy:** (CASE) Communication and Attitudinal Self Efficacy, The 19-item Cancer scale was used in this study. It assesses 3 domains: understanding and participating in care 6 items, maintaining positive attitude 5 items, seeking and obtaining information 8 items. This tool was adopted from *Wolf et al., (2005)*.

❖ **Scoring system:**

Each item has 4-point choice rating from 1= "Not all true" to 4 "Exactly true". The total scores of the scale were 19-76 grades. These scores were summed and were converted into a percent score. It was classified into 3 categories:

- **Low** self efficacy if score < 33%.
- **Moderate** self-efficacy if score from 33%-<66%.
- **High** self-efficacy if score from  $\geq 66\%$ .

▪ **Fatigue interference:** 13-items Fatigue Symptom Inventory (FSI)- measures how much fatigue has interfered with general activity, ability to bathe and dress oneself, normal work activity, ability to concentrate, relations with others, enjoyment of life, and mood, this tool was adopted from *Hann et al., (1998)*.

❖ **Scoring system:**

Each item has 0-10 point choice. The total scores of the scale were 0-130 grades. These scores were summed and were converted

into a percent score. It was classified into 3 categories:

- **Mild** fatigue if score < 50%.
- **Moderate** fatigue if score from 50%-<75%.
- **Severe** fatigue if score from  $\geq 75\%$ .

**Perceived stress:** this tool was adopted from *Cohen et al., (1983)* the 10-items Perceived Stress Scale was used to measure perception of stress and the degree to which situations in one's life are appraised.

❖ **Scoring system:**

Each item has 5 point choice rating from 0= "never" to 4 "Very Often". The total scores of the scale were 0-40 grades. These scores were summed and were converted into a percent score. It was classified into 3 categories:

- **Low** stress if score < 50%.
- **Moderate stress** if score from 50%-<75%.
- **High** stress if score from  $\geq 75\%$ .

**Social support:** The 19-items MOS-Social Support Questionnaire measured 4 types of social support: emotional/ informational support, tangible support, affectionate support, and positive social interactions, this tool was adopted from *Sherbourne, (1991)*.

❖ **Scoring system:**

Each item has 5 point choice rating from 1= "None of the time" to 5 "All of the time". The total scores of the scale were 19-95 grades. These scores were summed and were converted into a percent score. It was classified into 3 categories:

- **Low** level if score < 45%.
- **Moderate** level if score from 45%-<70%.
- **High** level if score from  $\geq 70\%$ .

**Administrative design:** An official letter was issued from the faculty of nursing, Ain Shams University to the medical and nursing directors of Oncology Center and Nuclear Medicine affiliated to Ain Shams University Hospitals explaining the purpose of the study and requesting the permission for data collection from the study group.

**Operational design:** It included preparatory phase, tools validity and reliability, pilot study and field work.

**A. Preparatory phase:** It included reviewing of the current and related literature and theoretical knowledge of the various aspects of this issue using books, articles, periodicals, magazines and internet in order to develop the tools for data collection.

**B. Tools validity and reliability:**

Testing validity (referred to how well a scientific test actually measures what it is intended to measure) of the proposed tools by using face and content validity. Face validity aimed to inspecting the items to determine whether the tools measure what supposed to measure. Content validity was conducted to determine whether the content of the tools cover the aim of the study *Lobiondo-wood & Haber, 2017*). Validity tested by a jury of 7 experts, two of them were professors, two were assistant professors, and one lecturer from medical surgical nursing department at faculty of nursing, Ain shams university and two medical consultant of the oncology department at Ain Shams University Hospitals. The experts reviewed the tools for clarity, relevance, comprehensiveness, simplicity and applicability, minor modification was done. Finally the final forms were developed.

**Testing reliability:**

It was referred to the extent to which the same answers can be obtained by using the same instruments more than one time *(Grove, et al., 2014)*; Testing reliability of the proposed tools was done statistically by Cronbach alpha test. Alpha Cronbach's: is a measure of internal consistency, that is how closely related to asset items are as a group, it is normally ranges between zero and one.

- Cronbach alpha for knowledge about breast cancer and hormonal therapy was 0.834.
- Cronbach alpha for medication adherence scale was 0.804.
- Cronbach alpha for Factors affecting women adherence to hormonal therapy was 0.810.

**Ethical consideration:**

The ethical research considerations in this study include the following:

A written approval was obtained from scientific research ethical committee in faculty of nursing at Ain Shams University before starting the study. The researcher was clarified the objective and aim of the study to the women's who have breast cancer and included in the study. The researcher was assured maintaining anonymity of the subjects' data of the women's included in the study. Women's will be informed that they are allowed to choose to participate or not in the study and all information will be confidential and used only for research purpose.

**Pilot study:** it was done carried out on 10% of total number of women (60) to ensure the feasibility, clarity, applicability of tools and time needed to fill the tools. According to the results of the pilot, no corrections and no omissions of items were performed, so the pilot study was included in the sample.

**Field work:** the collection of data lasted over a Period of 7 months; starting from April 2021 and ending in October 2021.

- The researcher visited the Outpatient breast clinic two days a week. Sunday and Wednesday during morning shifts (9.00 am to 2.00 pm), meeting about 1- 3 women each time.
- The women who fulfilled the inclusion criteria were selected.
- The interview questionnaires were conducted with each woman individually.
- The researcher obtained the women's oral consent for participating in this study after explaining the aim of the Study.
- Filling in the previously mentioned Tools was done by the researcher.
- First socio-demographic and medical health profile were collected from the women's medical records, from the women themselves and relatives. Then the researcher asks about women's knowledge regarding breast cancer and hormonal therapy, adherence level to medication and factors affecting adherence to adjuvant hormonal therapy.

○ These tools were completed within an average time from 70-90 minutes.

#### Statistical Design:

The data were collected, coded and entered into a suitable excel sheet. Data were analyzed using the statistical package for social sciences, version 20.0 (SPSS). The statistical analysis was done using percentage (%), mean, standard deviation; Chi-Square ( $\chi^2$ ) was used in order to compare proportions between two qualitative parameters. The observed differences and association were considered as follows:

Non-significant (NS)  $P > 0.05$ ,  
Significant (S)  $P \leq 0.05$ , Highly Significant (HS)  $P \leq 0.01$

#### Limitations of the study:

There was no limitation

#### Result:

**Table (1):** shows that, 43.3% of the studied women their age was  $\geq 50$  years, the Mean SD of age was  $46.3 \pm 11.58$  years. As regard to marital status, 80% of them were married. also, 56.7% of them residing at rural areas and housewives, respectively. Moreover, 60% of the studied women treated for free of charge. Likewise, 96.7% of them were not smokers. Also, 55% of the studied women had 4 family members and more. Also, 60% of the studied women had diploma / secondary education. 16.7% of them had high education. Also, 83.3% of the studied women had insufficient income to cover the costs of treatment. while, 16.7% of them had sufficient income to cover the costs of treatment.

**Table (2):** displays that, 53.3% of the studied women had mastectomy from two to less than four years, with Mean SD  $3.12 \pm 1.2$  years. Moreover, 91.7% of them suffered from fatigue and hot flashes on the face, respectively. 55% of the studied women started hormonal therapy 2-< 4 years, with Mean SD  $4.1 \pm 1.08$  years. Also, 100% of them take the drug orally and one time per day. Moreover, 90% of them take aromatase one time per day.

**Figure (1):** shows that, 63.3% of the studied women had unsatisfactory level of total knowledge about breast cancer and hormonal therapy.

**Table (3):** shows that, 40% of the studied women had high level of medication adherence. Also, 33.3% of them had moderate level. While, 26.7% of them had low level. The Mean $\pm$ SD of total medication adherence was  $3.2 \pm 1.23$ .

**Table (4):** displays that; the highest percent of physical and cognitive symptoms were 76.7% for musculoskeletal pain and 75% for other physical symptoms. While, 65% of them had vasomotor symptoms.

**Figure (2):** shows that 66.7% of the studied women had pain. Also, 20% of them had moderate pain, while 13.3% of them had mild pain.

**Figure (3):** shows that 50% of the studied women had severe depression. Also, 38.3 %of them had moderate depression, while 11.7% of them had mild depression.

**Figure (4):** shows that 50% of the studied women had low self-efficacy. Also, 33.3% of them had high self-efficacy, while 16.7% of them had moderate self-efficacy.

**Figure (5):** shows that 71.7% of the studied women's had sever fatigue. Also, 18.3% of them had moderate fatigue, while 10% of them had fatigue level.

**Figure (6):** shows that 68.3% of the studied women had high stress. Also, 26.7% of them had moderate stress, while 5% of them had low stress.

**Figure (7):** shows that 71.7% of the studied women had high level of social support. Also, 20% of them had moderate level, while 8.3% of them had low level.

**Tables (5):** indicate that, there was highly statistically positive correlation between knowledge and medication adherence, social

support, self-efficacy, and medication adherence of women with breast cancer. Also, there was highly statistically significant negative correlation between physical and psychological symptoms, pain, depression, fatigue, stress and medication adherence of women with breast cancer receiving hormonal therapy among studied sample.

**Table (1):** Distribution of the studied women according to their socio-demographic data (n=60).

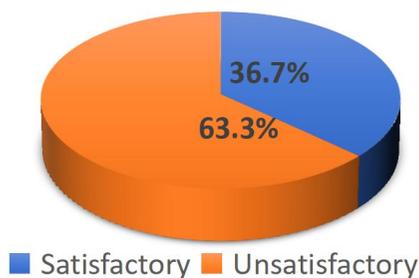
Socio-demographic data	N	%
<b>Age (years)</b>		
18-<30	4	6.7
30-<40	10	16.7
40-<50	20	33.3
≥ 50	26	43.3
<b>Mean SD</b>	<b>46.3 ± 11.58</b>	
<b>Marital status</b>		
Not-married	12	20
Married	48	80
<b>Residence</b>		
Rural	34	56.7
Urban	26	43.3
<b>Current job</b>		
Governmental Employee	14	23.3
Private employee	8	13.3
Housewife	34	56.7
Retired	4	6.7
<b>Treatment costs</b>		
Free of charge	36	60
Health insurance	14	23.3
Own expense	10	16.7
<b>Smoking</b>		
Yes	2	3.3
No	58	96.7
<b>Number of family members.</b>		
One	2	3.3
Two	7	11.7
Three	18	30
Four and more	33	55
<b>Education level</b>		
Can't read and write	5	8.3
Read and write	9	15
Diploma-secondary education	36	60
High education	10	16.7
<b>Income from women opinion</b>		
sufficient	10	16.7
nonsufficient	50	83.3

No significant at  $p > 0.05$ . \*Significant at  $p < 0.05$ . \*\*highly significant at  $p < 0.01$

**Table (2):** Number & percentage distribution of the studied women according to their present history (n=60).

Items	N	%
<b>The period since mastectomy until now</b>		
< 2 years	20	33.3
2-< 4 years	32	53.3
≥ 4 years	8	13.3
<b>Mean SD</b>	<b>3.12 ± 1.2</b>	
<b>*Suffer from any problems after hormonal treatment such as</b>		
Pain in joints and muscles	48	80
Nausea	52	86.7
Vaginal discharge	50	83.3
Dryness or irritation of the vagina	10	16.7
Weight gain	32	53.3
Impotence	22	36.7
Fatigue	55	91.7
Hair loss	22	36.7
Hot flashes on the face	55	91.7
<b>Time that starts hormonal therapy</b>		
1-< 2 years	18	30
2-< 4 years	33	55
<b>The method of taking the drug</b>		
Injection	0	0
Oral	100	100
<b>The name of the hormonal treatment used</b>		
Tamoxifen	6	10
Aromatase (Femara - Aramidex)	54	90
<b>Frequency of taking hormonal therapy / day</b>		
One time	60	100
Twice	0	0

No significant at  $p > 0.05$ . \*Significant at  $p < 0.05$ . \*\* highly significant at  $p < 0.01$ .

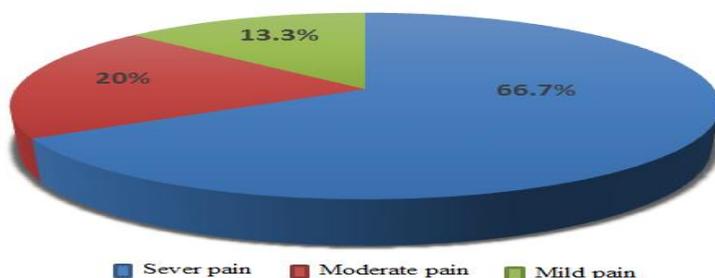
**Figure (1):** Percentage distribution of the studied women according to their total knowledge (n=60).

**Table (3):** Distribution of the studied women according to their total medication adherence (n=60).

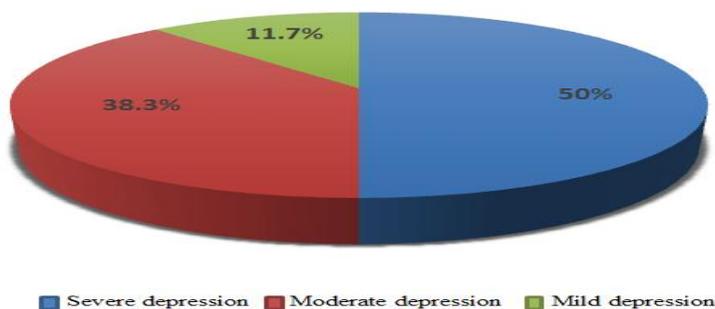
Total Morisky Medication Adherence (MMAS-8)	Studied sample (n = 60)	
	N	%
High	24	40.0
Moderate	20	33.3
Low	16	26.7
<b>Mean ± SD</b>	<b>3.2±1.23</b>	

**Table (4):** Number & percentage distribution of the studied women according to their total physical and cognitive symptoms (n=60).

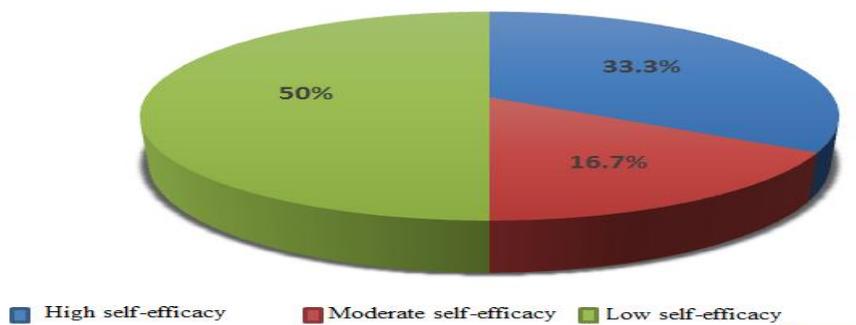
Items	Severe		Moderate		Mild		Mean±SD
	N	%	N	%	N	%	
Cognitive	40	66.7	11	18.3	9	15.0	4.12±1.26
Musculoskeletal pain	46	76.7	11	18.3	3	5.0	1.53±0.78
Vasomotor	39	65.0	14	23.3	7	11.7	2.6±1.08
Gastrointestinal	41	68.3	13	21.7	6	10.0	2.05±1.03
Dyspareunia	40	66.7	14	23.3	6	10.0	1.33±0.95
Bladder control	41	68.3	12	20.0	7	11.7	3.42±1.12
Weight concerns	42	70.0	10	16.7	8	13.3	2.8±1.04
Gynecologic	44	73.3	9	15.0	7	11.7	2.2±1.11
Other physical symptoms	45	75.0	10	16.7	5	8.3	7.5±1.76



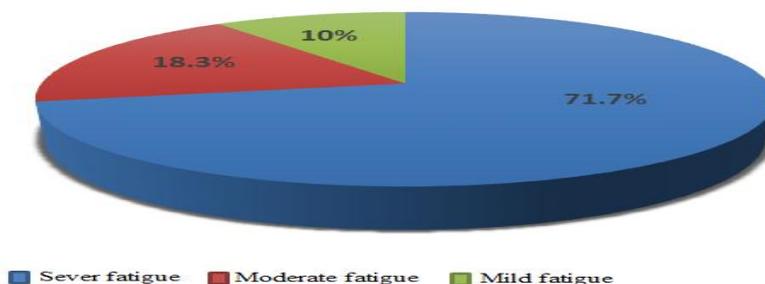
**Figure (2):** Percentage distribution of the studied women according to pain interfering level (n=60).



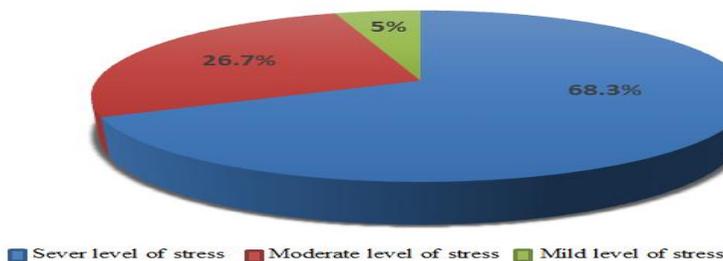
**Figure (3):** Percentage distribution of the studied women according to total level of depression (n=60).



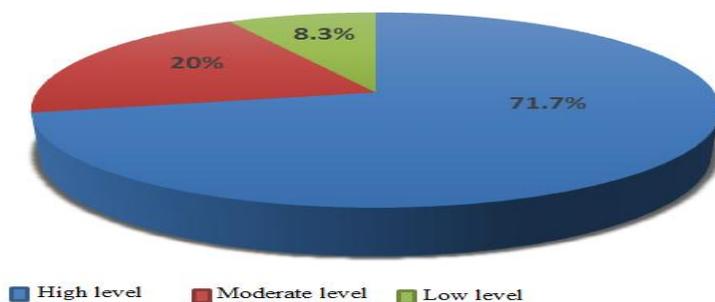
**Figure (4):** Percentage distribution of the studied women according to total level of self-efficacy about breast cancer (n=60).



**Figure (5):** Percentage distribution of the studied women's regarding to total level of fatigue symptoms (n=60).



**Figure (6):** Percentage distribution of the studied women regarding to the total level of stress (n=60).



**Figure (7):** Percentage distribution of the studied women regarding to their total level of social support about breast cancer and hormonal therapy (n=60).

**Table (5):** Correlation between knowledge, Morisky, physical and cognitive symptoms, Pain, Depression, Self-efficacy, Fatigue and Stress scores.

Items		Total knowledge score	Total Morisky Medication Adherence (MMAS-8) score	Total physical and psychological symptoms score	Total Pain score	Total Depression score	Total Self-efficacy score	Total Fatigue score	Total Stress score
Total Morisky Medication Adherence (MMAS-8) score	r	0.719							
	P-value	<0.001*							
Total physical and cognitive symptoms score	r	-0.829	-0.582						
	P-value	<0.001*	<0.001*						
Total Pain score	r	-0.825	-0.563	0.743					
	P-value	<0.001*	<0.001*	<0.001*					
Total Depression score	r	-0.691	-0.404	0.606	0.676				
	P-value	<0.001*	<0.001*	<0.001*	<0.001*				
Total Self-efficacy score	r	0.126	-0.021	-0.117	-0.085	-0.156			
	P-value	0.336	0.871	0.375	0.520	0.235			
Total Fatigue score	r	-0.868	-0.617	0.816	0.718	0.664	-0.139		
	P-value	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	0.288		
Total Stress score	r	-0.825	-0.491	0.683	0.713	0.640	-0.107	0.691	
	P-value	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	0.417	<0.001*	
Total Social support score	r	0.851	0.577	-0.739	-0.803	-0.784	0.148	-0.791	-0.696
	P-value	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	0.259	<0.001*	<0.001*

No significant at  $p > 0.05$ . \*Significant at  $p < 0.05$ . \*\*highly significant at  $p < 0.01$ .

**Discussion:**

Hormonal positive expression represents the major molecular subtype of breast cancer prevalent in patients worldwide. Tamoxifen, aromatase inhibitors (A.I), ovarian function suppression (OFS) have become established therapies in the adjuvant scene that have clearly improved outcomes in this malignancy and contributed substantially to survivorship. Although these therapies are in the oral form

mostly and thus seem easy to comply with, nevertheless previous investigators have reported varying rates of adherence and discontinuation (*Abdelaziz et al., 2022*).

Regarding women’s age less than half of the studied women their age were fifty years and more, from the researcher point of view this could be attributed to that the aging process is one from the factors that leading to breast cancer due to genetic mutations in the body and

hormonal changes with aging. This result is in agreement with *Lima et al. (2021)* who conducted a study entitled “Global breast cancer incidence and mortality trends by region, age-groups, and fertility patterns” and found that the global increase in breast cancer incidence is seen in all age groups, and is highest in women ages from 50 and 70 years.

Regarding women’s income majority of the studied women had insufficient income to cover the costs of treatment. This result is in agreement with *Saeed, et al., (2021)* who found that in many cases, most of the cost is borne by the patient and his/her family and their income had insufficient.

Regarding education level, less than two thirds of the studied women had diploma / secondary education. Also, less than one fifth of them had high education. This result was in agreement with *Boškailo et al., (2021)* who conducted a study entitled “Resilience and quality of life of patients with breast cancer” and found that half of women had secondary level of education.

Regarding present history, more than half of the studied women had mastectomy from two to less than 4 years. Moreover most of them suffered from fatigue and hot flashes on the face, from the researcher point of view this due to side effect of hormonal therapy or the disease itself accompanied with symptoms. This result was in agreement with *Wako et al., (2021)* who conducted a study entitled “Adherence to adjuvant hormonal therapy and associated factors among women with breast cancer attending the Tikur Anbessa Specialized Hospital, Addis Ababa Ethiopia” and found that the majority of women had fatigue and mastectomy from more than two years.

Regarding hormonal therapy, more than half of the studied women started hormonal therapy from two to less than four years. Also, the most of them take the drug orally, and take aromatase one time per day. This result is in agreement with *Abdel Aziz et al., (2022)* who conducted a study entitled “Adherence and Discontinuation of Endocrine Therapy among Egyptian Breast Cancer Patients Receiving

Adjuvant Treatment” and found that most of women take hormonal therapy orally and started hormonal therapy from four years.

Regarding women’s total level of knowledge, less than two third of the studied women had unsatisfactory level of knowledge. while, more than one third of them had satisfactory level. From the researcher point of view, this result may be due to women had moderate level of education.

This result is in agreement with *Tan et al., (2021 a)* who conducted a study entitled “Beliefs about medicines and adherence in women with breast cancer on adjuvant endocrine therapy” and found that majority of participants had unsatisfactory level of knowledge about breast cancer and hormonal therapy.

Regarding total medication adherence, more than one third of the studied women had high level of medication adherence. Also, one third of them had moderate level; while, more than one quarter of them had low level. From the researcher point of view, this result might be due to medications of cancer generally caused side effect on health status of patients with cancer.

This result is supported with *Saad and salih (2021)* who conducted a study entitled “Adherence and Beliefs to Adjuvant Hormonal Therapy in Patients with Breast Cancer” and found that near one third of participants had fully adherence to medication.

Regarding to subtotal physical and cognitive symptoms more than three quarters of studied women had sever musculoskeletal pain, more than two thirds of them had sever difficult bladder control and had sever dyspareunia. While, two third of studied women had sever vasomotor symptoms. From the researcher point of view, this result might be due to medication of breast cancer effect negatively on muscles of women and cause osteoporosis for them with long term of medication therapy in addition to other symptoms.

This result is in agreement with *Abdel Aziz, et al., (2022)*.who found that more than three quarters of women had problems of their muscles

and bladder from take medication therapy about breast cancer.

Regarding level of pain reported by women with breast cancer, two thirds of studied women had sever pain. From the researcher point of view this result might be due to the disease itself may cause breast pain in some women. Also pain may be due to side effect of hormonal treatment on bone and other body parts.

This result is in agreement with *Paranjpe et al., (2019)* who conducted a study entitled "Identifying adherence barriers to oral endocrine therapy among breast cancer survivors" and found that more than half of women had sever level of pain with hormonal therapy specifically muscle pain and joint pain; while less than one third had moderate and mild level.

Regarding to total depression level reported by women with breast cancer, half of studied women had severe depression. From the researcher point of view this result might be due to side effect of the hormonal treatment on mood and psychological system.

This result is in agreement with *Cavazza et al., (2020)* who conducted a study entitled "Factors influencing adherence to adjuvant endocrine therapy in breast cancer-treated women: using real-world data to inform a switch from acute to chronic disease management." and found that more than half of women had sever level of depression and on treatment for depression, while the majority had low level.

Regarding to total self-efficacy level reported by women with breast cancer, half of studied women had low self-efficacy. From the researcher point of view this result may be due to the disease itself can affect negatively on women self-confidence to being cured from it.

This result is in agreement with *Toivonen et al., (2021)* who conducted a study entitled "A survey of potentially modifiable patient-level factors associated with self-report and objectively measured adherence to adjuvant endocrine therapies after breast cancer." and found that more

than one third of women had high level of self-efficacy, while the more than half had low level.

Regarding to total fatigue level reported by women with breast cancer, near three quarters of studied women had sever fatigue. From the researcher point of view this result might be due to the negative side effect of hormonal therapy.

This result is in agreement with *Peddie et al., (2021)* who conducted a study entitled "The impact of medication side effects on adherence and persistence to hormone therapy in breast cancer survivors "and found that more than three quarter of women had sever level of fatigue.

Regarding to total stress level reported by women with breast cancer, more than two thirds of studied women had severe stress. Also, more than one quarter of them had moderate level; while, minority of them had mild level. From the researcher point of view this result might be due to the disease of breast cancer that forcing women to Face big changes in their life all time.

This result is in agreement with *Ream (2021)* who conducted a study entitled "Long-Term Endocrine Therapy Adherence Following Stress Management for Breast Cancer" and found that more than half of women had sever level of stress and less than half had moderate level.

Regarding to total social support level reported by women with breast cancer, near three quarters of studied women had high level of social support. From the researcher point of view this result might be due to cancer is a critical disease so social support is considered a complex construct which has long been suggested to have direct and buffering effects on patients' wellbeing and emotional adjustment to cancer.

This result is in agreement with *Toledo et al., (2020)* who conducted a study entitled "Exploring the role of social support and adjuvant endocrine therapy use among breast cancer survivors" and found that majority of women had high level of social support.

Regarding correlation between study variables: There was significant positive

correlation between total knowledge, self-efficacy, social support and medication adherence of women with breast cancer receiving hormonal therapy among studied sample. Also, there was significant negative correlation between physical and psychological symptoms, pain, depression, fatigue, stress, and medication adherence of women with breast cancer receiving hormonal therapy among studied sample

This result is in agreement with *Toivonen et al. (2020)* who found that there was a positive correlation between total knowledge, self-efficacy, social support and medication adherence of women with breast cancer receiving hormonal therapy.

### Conclusion:

**Based on the findings of the present study, the investigator concludes that:**

Near two thirds of women had unsatisfactory level of total knowledge about breast cancer and hormonal therapy. Approximately a quarter of the women with breast cancer did not adhere to hormone treatment. Regarding factors that affecting adherence to adjuvant hormonal therapy, the Study had identified several factors that are associated with non-adherence to adjuvant endocrine therapy; these factors include side-effects of treatment especially musculoskeletal pain, fatigue, knowledge of cancer, forgetfulness, beliefs, depressive symptoms, attitudes and self-efficacy. there was significant negative correlation between total physical and psychological symptoms, pain, depression, fatigue, stress, and medication adherence of women with breast cancer receiving hormonal therapy among studied sample at ( $P < 0.01$ ).

### Recommendation:

**Based on the results of the current research, the following suggestions for future research and practice are proposed:**

1. Educational programs and motivational interviewing should be planned about successful result of hormonal therapy so encourage them to adhere to medication.

2. Women are in need of a simplified and comprehensive Arabic booklet including information about action, side effect and best effective period for medication. Also rely that the effectiveness of treatment depends on the efficacy of the medication and patient adherence to the therapeutic regimen.
3. Working toward increasing women awareness and screening for breast cancer at regular intervals among high risk groups is paramount to recognize breast cancer disease at early stage before the progresses and metastatic to another organ.
4. Follow up care for women with breast cancer through phone calls, internet and clinical visits by trained oncology nurses at breast cancer clinics should be added to the care of those women.
5. Replication of the current study on a larger probability sample is recommended to achieve generalization of the results and wider utilization of the designed instructions.
6. Importance of all health care providers namely the nurses to take into consideration all the studied factors affecting women adherence for hormonal therapy in planning and managing care for such group of women.
7. The establishment of special centers in different governorates of Egypt especially rural area to promote and integrate care, follow up, teaching for breast cancer women.

### References:

- Abdelaziz, A. H., Ezz El Din, M., Abdou, A. M., Rabea, A.M. & Hussien, N. (2022):** Adherence and Discontinuation of Endocrine Therapy among Egyptian Breast Cancer Patients Receiving Adjuvant Treatment: A Cross-sectional Study. *Chemotherapy*, 3(99), 43-2.
- Abramson, C.M., Joslyn, J., Rendle, K.A., Garrett, S.B. and Dohan, D. (2018):** The Promises of computational ethnography: Improving transparency, replicability, and Validity for realist approaches to Ethnographic analysis. *Ethnography*, 19 (2), 254-284.
- Alorabi M and Elghazawy H, (2021):** Cancer control in Egypt :investing in health; published in march-25-2021. Retrieved on 18 april 2022 Available at

- <https://ascopost.com/issues/march-25-2021/cancer-control-in-egypt/>.
- AlOmeir, O., Patel, N., & Donyai, P. (2020):** Adherence to adjuvant endocrine therapy among breast cancer survivors: a systematic review and meta-synthesis of the qualitative literature using grounded theory. *Supportive Care in Cancer*, 28 (11), 5075-5084.
- American Cancer Society (2015):** Lymphedema: What Every Woman with Breast Cancer Should Know: Hand and Arm Care after Surgery or Radiation Therapy for Breast Cancer, Available Online at: [www.cancer.org](http://www.cancer.org). Accessed on 2 April, 2015.
- El-Feqi, B., Abd El-Aziz, M., Hassan, M. & Mohamed, Y. (2020):** Knowledge and Self Care Practices for Women with Breast Cancer Related Lymphedema. *egyptian journal of health care*, 2020 ejhcvol.11 no.2.
- Boškailo, E., Franjić, D., Jurić, I., Kiseljaković, E., Marijanović, I., & Babić, D. (2021):** Resilience and quality of life of patients with breast cancer. *Psychiatria Danubina*, 33(suppl 4), 572-579.
- Cavazza, M., Banks, H., Ercolanoni, M., Cukaj, G., Bianchi, G., Capri, G., & Longo, F. (2020):** Factors influencing adherence to adjuvant endocrine therapy in breast cancer-treated women: using real-world data to inform a switch from acute to chronic disease management. *Breast cancer research and treatment*, 183(1), 189-199.
- Cella, D., Land, S.R., Chang, C.H., Day, R., Costantino, J.P., Wolmark, N. & Ganz, P.A. (2008):** Symptom measurement in the Breast Cancer Prevention Trial (BCPT)(P-1): psychometric properties of a new measure of symptoms for midlife women. *Breast cancer research and treatment*, 109(3), 515-526.
- Cleeland, C.S. (1989):** Measurement of pain by self-report. In: Chapman, CR, Loeser, JD, eds. *Advances in Pain Research and Therapy*. New York, NY: Raven Press; 391-403.
- Cohen, S., Kamarak, T. & Mermelstein, R. A. (1983):** Global measure of perceived stress. *J Health Soc Behav*. 1983; 24(4): 385-396.
- Fadelu, T.A., Buswell, L. & Anderson, B.O. (2022):** Improving Adherence to Adjuvant Endocrine Therapy in Sub-Saharan Africa: Challenges and Innovative Nurse-Driven Solutions. *The Oncologist*.
- Grove, S. K., Gray, J. R. & Burns, N. (2014):** Introduction to qualitative research. *Understanding Nursing Research: Building an Evidence-Based Practice*. 6th edition. China, Elsevier Health Sciences, 76-77.
- Hagen, K.B., Aas, T., Kvaløy, J.T., Soiland, H. & Lind, R. (2019):** Adherence to adjuvant endocrine therapy in postmenopausal breast cancer patients: A 5-year prospective study. *The Breast*, 44, 52-58.
- Hann, D.M., Jacobsen, P.B., Azzarello, L.M., Martin, S.C., Curran, S.L., Fields, K.K., Greenberg, H. & Lyman, G. (1998):** Measurement of fatigue in cancer patients: development and validation of the Fatigue Symptom Inventory. *Qual Life Res*. 7(4):301-10.
- Heer, E., Harper, A., Escandor, N., Sung, H., McCormack, V. & Fidler- Benaoudia, M.M. (2020):** Global burden and trends in premenopausal and postmenopausal breast cancer: a population-based study. *The Lancet Global Health*, 8(8), e1027-e1037.
- Kuba, S., Maeda, S., Matsumoto, M., Yamanouchi, K., Yano, H., Morita, M.,... & Eguchi, S. (2018):** Adherence to adjuvant endocrine therapy in women with breast cancer: a prospective observational study in Japanese women. *Clinical Breast Cancer*, 18(2), 150-156
- Leavy, P. (2017):** Research design: Quantitative, qualitative, mixed methods, arts-based, and community- based participatory research approaches. Guilford publications. pp133-158.
- Lima, S.M., Kehm, R.D. & Terry, M.B. (2021).** Global breast cancer incidence and mortality trends by region, age-groups, and fertility patterns. *EClinicalMedicine*, 38, 100985.
- Lobiondo-Wood, G. & Haber, J. (2017):** Reliability and Validity. *Nursing research: Methods and Critical Appraisal for Evidence-Based Practice*, 9<sup>th</sup> edition. China: Elsevier health science. 262-266.
- Morisky, D.E., Green, L.W. & Levine, D. M. (1986):** Concurrent and predictive validity of a self-reported measure of medication adherence. *Medical care*, 67-74.
- Paranjpe, R., John, G., Trivedi, M. & Abughosh, S. (2019):** Identifying adherence barriers to oral endocrine therapy among breast cancer survivors. *Breast Cancer Research and Treatment*, 174(2), 297-305.

- Peddie, N., Agnew, S., Crawford, M., Dixon, D., MacPherson, I. & Fleming, L. (2021):** The impact of medication side effects on adherence and persistence to hormone therapy in breast cancer survivors: A qualitative systematic review and thematic synthesis. *The Breast*, 58, 147-159.
- Radloff, L.S. (1977):** The CES-D Scale: a self-report depression scale for research in the general population. *Appl Psychol Meas.* 1(3):385-401.
- Ream, M. E. (2021):** Long-Term Endocrine Therapy Adherence Following Stress Management for Breast Cancer (Doctoral dissertation, University of Miami)
- Saad, A.H. & Salih, H. (2021):** Adherence and Beliefs to Adjuvant Hormonal Therapy in Patients with Breast Cancer: A Cross-Sectional Study (Conference Paper). *Iraqi Journal of Pharmaceutical Sciences* (P-ISSN: 1683-3597, E-ISSN: 2521-3512), 30(Suppl.), 31-39.
- Saeed, S., Asim, M., & Sohail, M. M. (2021):** Fears and barriers: problems in breast cancer diagnosis and treatment in Pakistan. *BMC women's health*, 21(1), 1-10.
- Saleh, B., Elhawary, M. A., Mohamed, M. E., Ali, I. N., El Zayat, M. S., & Mohamed, H. (2021):** Gail model utilization in predicting breast cancer risk in Egyptian women: a cross-sectional study. *Breast cancer research and treatment*, 188(3), 749-758.
- Sherbourne, C.D. & Stewart, A.L. (1991):** The MOS social support survey. *Soci sci med*, 32(6):705-714.
- Tan, E.H., Wong, A.L.A., Tan, C.C., Wong, P., Tan, S.H., Ang, L.E. Y.,... & Tai, B.C. (2021a):** Beliefs about medicines and adherence in women with breast cancer on adjuvant endocrine therapy. *Journal of Health Psychology*,
- Timby, B. & Simth, M. (2014):** *Medical Surgical of Nursing*, 11th ed., Wolters Kluwer, China, Pp. 496, 854.
- Toivonen, K. I., Williamson, T. M., Carlson, L. E., Walker, L. M., & Campbell, T. S. (2020):** Potentially modifiable factors associated with adherence to adjuvant endocrine therapy among breast cancer survivors: a systematic review. *Cancers*, 13(1), 107.
- Toivonen, K.I., Carlson, L.E., Rash, J.A. & Campbell, T.S. (2021):** A survey of potentially modifiable patient-level factors associated with self-report and objectively measured adherence to adjuvant endocrine therapies after breast cancer. *Patient preference and adherence*, 15, 2039.
- Toledo, G., Ochoa, C.Y. & Farias, A.J. (2020):** Exploring the role of social support and adjuvant endocrine therapy use among breast cancer survivors. *Supportive Care in Cancer*, 28(1), 271-278
- Wako, Z., Mengistu, D., Dinegde, N. G., Asefa, T. & Wassie, M. (2021):** Adherence to adjuvant hormonal therapy and associated factors among women with breast cancer attending the Tikur Anbessa Specialized Hospital, Addis Ababa Ethiopia, 2019: a cross-sectional study. *Breast Cancer: Targets and Therapy*, 13, 383.
- Wolf, M.S., Chang, C.H., Davis, T. and Makoul, G. (2005):** Development and validation of the communication and attitudinal self-efficacy scale for cancer (CASE-cancer). *Patient Educ Couns.* 57(3): 333-341.