

Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

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Abstract: Background: Fear and anxiety can predispose breast cancer (BC) patient to serious consequences including non-adherence to chemotherapeutic agents leading to uncontrolled management. The situation is more complex during Covid-19 pandemic. **The purpose** of this study was to determine the relationship between fear, anxiety and chemotherapy adherence among patients having breast cancer during COVID-19. A cross-sectional correlational design was used. **Sample:** A purposive sample of 168 patients having breast cancer was selected. **Setting:** The study was conducted in the Chemotherapy Department at El Tagamoo El Awal Breast Cancer Hospital. Data was collected using *three* instruments. Instrument one: (a) Structured Interview Questionnaire, (b) Assessment of Fear of COVID-19 Likert Scale and Instrument two: Beck anxiety Inventory (BAI) Likert scale. Instrument three: Chemotherapy Adherence Questionnaire. **Results:** The higher percentage (59.50%) of patients missed more than 4 cycles of chemotherapy. A strongly positive relationship was found between mean score of anxiety and fear ($r=.318^{**}; P=.000$) among BC patients. Studied patients had severe anxiety (54.33 ± 8.89), high level of fear mean score (28.43 ± 4.87) and non adherence to chemotherapy (7.02 ± 1.89). **Conclusion:** There is a strong positive relationship between fear and anxiety. Chemotherapy adherence among patients having breast cancer during COVID-19 is reduced if patients have high levels of fear and anxiety. Replication of the study in different geographical areas is recommended to generalize the results.

Key Words: Anxiety, Breast cancer, Chemotherapy Adherence, Fear

Introduction

Breast cancer is the most frequently encountered cancer among female in the world accounting 1 in 4 cancer cases and leading cause of death in many countries including least developed countries (Legese, Addissie, Gizaw, Tigneh & Yilma, 2021). A systematic review was done by Webb, Murray, Younger, Goodfellow & Ross (2021) mentioned that women with mastectomy have wide range of needs which require appropriate follow up. The same review highlighted that the common needs were information about their illness and adherence to treatment options, knowing what to expect during health crisis and continuous communication with health care professionals.

Oncology nurses can play a significant role to identify the patients need when they are faced with any crisis such as COVID-19. Based on identify needs, the nurse can develop a guide care plan in collaboration with physicians and provide high quality care (Alper, O'Malley & Greenwald, 2017; Yilmaz, 2017). Patient with breast cancer have fear about disease and medication, the role of nurse is to encourage patient to share thought, feeling and to design and implement effective strategies to manage their fear, anxiety as well as all patients' complains (Vera, 2019). Fear and anxiety can predispose patient to serious consequences including medication non-adherence to chemotherapeutic drug agents leading to relapse of cancer, metastasis and uncontrolled management. The situation is more complex during COVID 19 pandemic as nursing practice face great challenges that require extensive, accurate and organized work efforts from nurse researchers to determine the impact of COVID 19 pandemic on treatment

plans among breast cancer patients (Hugtenburg & Timmers, 2013).

Significance of the study:

In 2020 World Health Organization (WHO) reported that breast cancer is the most common form of cancer globally, there were 2.3 million women diagnosed with breast cancer and it causes the greatest number of cancer related deaths among women, it is estimated that 685,000 women died from breast cancer which represent approximately 15% of all cancer deaths among women. In Egypt breast cancer is the most prevalent and representing 18.9% of total cancer cases among women (Bray et al., 2018). According to National Cancer Institute (NCI), Cairo University, in year 2020 there were 1148 cases done different surgical procedures and receiving chemotherapy (National Cancer Institute Statistic Department & Medical Record 2020).

From the researchers' clinical experience, it was observed that some patients with breast cancer think hospitals pose a risk for infection during COVID -19 pandemic and postpone their chemotherapy sessions as well follow up visits. In this respect, patients' health status could benefit from teleoncology and teleconsultation services that include follow up of adherence to chemotherapy and providing support and reassurance. So, determining these patients' fears and anxiety as well the impact on their adherence to chemotherapy was relevant and missed in Egyptian context. Meanwhile, a few studies were carried out to determine the relationship between fear, anxiety and chemotherapy adherence among patients having breast cancer during COVID-19. So this study will contribute to reduce risk of

Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

complications that caused by chemotherapy postponement, improve patient's prognosis and nursing care provided, improve quality of care, which consequently reduce the financial burden. Moreover, it is hoped that this study results will add to the nursing body of knowledge, improve evidence based practice for wide application of teleoncology and teleconsultation in Egypt as well as open a new gate for other researches.

Purpose:

To determine the relationship between fear, anxiety and chemotherapy adherence among patients having breast cancer during COVID-19.

Research question:

Is there a relationship between fear, anxiety and chemotherapy adherence among patients having breast cancer during COVID-19?

Methods

Design

A cross-sectional correlational design was used to achieve the purpose of the study.

Sample

A purposive sample of BC patients receiving chemotherapy post mastectomy were selected in the study.

Inclusion criteria:

Patients should have missed one cycle or more of chemotherapy during the period starting from 1st of March to 1st of July 2021.

Exclusion criteria:

1. Patients who had infection of Covid-19 and received vaccination (It affects adherence to chemotherapy, fear and anxiety).
2. Patients who have communication deficits and cognitive impairments

were excluded from the study (these problems may alter their feelings of fear and anxiety).

For calculating sample size, the researchers assumed that 50% of breast cancer patients were suffering from fear and anxiety of chemotherapy during COVID-19 and 290 of them missed the cycle of chemotherapy. Therefore, 168 patients were included in the study according to sample size calculation formula, $n=N/(1+ Ne^2)$ in which (n) is the sample size, (N) is total population and (e) is a margin of error. Confidence interval was considered at 95% and utilized margin of Error was 0.05 (TAHERDOOS, 2016).

Setting

The study was conducted in the Chemotherapy Department at El Tagamoo El Awal Breast Cancer Hospital which is affiliated to the National Cancer Institute, Cairo University. This hospital was established to be the first specialized place for the treatment of patients having breast cancer. It provides free management services and includes many departments such as Chemotherapy and Radiotherapy Departments.

Instruments:

Three instruments were utilized:

Instrument one:

It contains two parts:

- **Part one:** It was developed by the researcher after a review of literature to assess the characteristics of the sample. Subpart A contains 9 items related to gender, age, occupation, level of education, marital status, residence area, transportation methods and family income. Subpart B contains 6 items related to medical data such

Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

as chronic diseases missed cycle of chemotherapy,.....etc.

- **Part two:** Fear of COVID-19 Likert Scale. This instrument was developed by Ahorsu, Lin, Imani, Saffari, & Pakpour (2020). Then, it was translated into Arabic and validated by Alyami, Henning, Krageloh & Alyami (2020). It aims to assess fear of COVID-19. It contains 7-items such as I am most afraid of Corona; it makes me uncomfortable to think about Corona; my hands become clammy when I think about Corona....etc. It is rated on a 5-point Likert Scale (ranging from —strongly disagree to 5—strongly agree). For each question, the minimum possible score is 1 and the maximum is 5. To calculate the score, all items are summed to obtain the fear score (ranging from 7 to 35). Reliability using Cronbach's α coefficient for this instrument was assessed ($\alpha=0.925$).

Instrument two: Beck anxiety

inventory:

It is a likert scale that was developed by Beck, Epstein, Brown & Steer (1988). It contains 21 items. They were rated on a 4 point Likert scale. Each item have four possible answers (0–3). Scoring system for each item is as follows: (0) means Not at all bother me, (1) means Mildly, but it didn't bother me much, (2) means Moderately – it wasn't pleasant at times, (3) means Severely – it bothered me a lot. The total score ranges from 0 to 63. To determine the reliability of this instrument, Cronbach's α coefficient was used ($\alpha=0.949$).

Instrument three: Chemotherapy

adherence questionnaire:

This questionnaire is developed by Thompson et al., (2000), It is designed

to assess patients' behaviors and attitudes towards medications. This instrument has been modified by the researchers to be suitable for patients receiving chemotherapy. It contains 10 items such as patient's forgetting to take the medication and attend chemotherapy session only, attend chemotherapy if severely ill....etc. The patients are asked to respond to the statements by encircling the correct answer (yes or no). Scoring system for each answer was 1 for (Yes) and 0 for (No) response. The total scores ranged from 0 to 10. If obtained score was above 5, non-adherence to chemotherapy and medication during pandemic was expected. Adherence to chemotherapy was < 5 .

Procedure

An official letter was submitted from the Vice Dean of Postgraduate Affairs, Faculty of Nursing, Cairo University to the Vice Dean of Postgraduate Affairs at NCI and director of Chemotherapy Department at El Tagamoo El Awal, Breast Cancer Hospital which is affiliated to Cairo University. This letter contained the purpose and methods of data collection. After receiving the permission, data was collected from the records of patients who did not come for chemotherapy session since the beginning of March, telephone conversation was initiated to contact the patients in order to collect information about fear, anxiety and chemotherapy adherence. Then, telephone calls WhatsApp were used to assess patients' fears, anxiety and chemotherapy adherence. The time that was spent for answering each instrument ranged between 20 to 30 minutes.

Ethical Consideration

Approval is obtained from the Vice Dean of postgraduate Affairs at

Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

NCI. The Institutional Review Board (IRB) approval was granted from a National Cancer Institute, Cairo University (Approval number: 2109-110-002). A formal written approval to share in the study was obtained from each participant after providing a clear explanation of the purpose of the study and methods of data collection. Also, they were assured about the confidentiality and privacy of their collected data.

Statistical analysis

Descriptive statistics using frequency, mean and standard deviation (SD) were utilized. Inferential statistics such as the Pearson correlation coefficient (r) was used to assess the association between anxiety, fear and chemotherapy adherence. Also, one way ANOVA was utilized to assess personal characteristics and medical data in relation to fear, anxiety as well chemotherapy adherence. A statistically significant difference was considered if $P < 0.05$. A very highly statistically significant difference was considered if $P < 0.01$.

Results

Table 1 shows the relationship between the mean score of fear, anxiety, chemotherapy adherence and personal characteristics of the study sample. As 54.8% of patients ranged between 30 to less than 40 years and most of them (63.1%) were living in an urban area. The majority of them were married (89.3%). There were very highly statistical significant differences between mean scores of fear, anxiety,

chemotherapy adherence and personal characteristics of the study sample.

Table 2 illustrates the relationship between mean scores of fear, anxiety, chemotherapy adherence and medical data of the study sample. It clarifies that there is a very highly statistical significant relationship ($P = .0001$) between means of fear, anxiety, chemotherapy adherence and medical data such (e.g. chronic diseases and infection with COVID-19).

Table 3 illustrates the relationship between mean scores of fear, anxiety and chemotherapy adherence. It illustrates that there was a highly statistical significant positive relationship between fear and anxiety. Also, there was a statistical significant positive relationship between anxiety and chemotherapy adherence.

Table 4 denotes distribution of the study sample according to their level of fear. It is clear that 1.80%, 11.30%, 48.20 and 38.70 % disagreed, neutral, agreed and strongly agreed that they had fear of COVID-19. Mean and standard deviation of fear level was 28.43 ± 4.87 .

Table 5 shows the distribution of the study sample according to their level of anxiety. It illustrates that the majority of the study sample had severe anxiety level (89.90%). Mean of the level of anxiety is 54.33 ± 8.89 .

Table 6 illustrates the distribution of the study sample according to their adherence to chemotherapy. It reveals that the majority of the study sample 79.20 % had no adherence to chemotherapy during COVID-19.

Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

Table1: Relationship between the mean score of fear, anxiety, chemotherapy adherence and personal characteristics of the study sample

Variables	Categories	No	%	Fear		Anxiety		Chemotherapy Adherence	
				F	P-value	F	P-value	F	P-value
Age	30<40	92	54.8	6.400	.000*	10.041	.000**	6.129	.000**
	40<60	70	41.7						
	≥ 60	6	3.5						
Place of Residence	Urban	106	63.1	5.345	.000*	3.451	.000**	4.777	.000**
	Rural	62	36.9						
Marital status	Single	3	1.8	1.672	.070	7.247	.000**	1.653	.114
	Married	150	89.3						
	Divorced	9	5.3						
	Widow	6	3.6						
Income	Adequate	75	44.6	6.399	.000*	3.034	.000**	7.963	.000**
	Inadequate	93	55.4						
Level of Education	Can't read and write	6	3.6	3.708	.000*	4.773	.000**	7.125	.000**
	Read and write	44	26.2						
	Primary	53	31.5						
	Secondary	45	26.8						
	University	20	11.9						

Significant at *P< 0.05; F value of Anova test

**denotes very highly statistical significant difference

Table 2: Relationship between mean scores of fear, anxiety, chemotherapy adherence and medical data of the study sample

Medical Data	Fear		Anxiety		Chemotherapy Adherence	
	F	P. value	F	P. value	F	P. value
Chronic diseases	3.603	.000**	3.019	.000**	4.511	.000**
Missed chemotherapy	1.978	.028*	8.041	.000**	6.125	.000**
Infected with COVID-19	4.008	.000**	4.536	.000**	7.304	.000**
Received COVID Vaccine	2.834	.001**	8.782	.000**	2.406	.018*

*P ≤0.05**denotes very highly statistical significant differences

Table 3: Relationship between mean scores of fear , anxiety and chemotherapy adherence

Scores	Fear		Anxiety		Chemotherapy Adherence	
	r	p	R	P	r	P
Fear	1					
Anxiety	.318**	0.000**	1			
Chemotherapy adherence	-.034	.660	.189*	.014*	1	

*P ≤0.05 **denotes very highly statistical significant difference

Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

Table 4: Distribution of the study sample according to their level of fear.

Fear Levels	NO	%	Mean ±SD
Strongly disagree	0.00	0.00	28.43 ± 4.87
Disagree	3	1.80	
Neutral	19	11.30	
Agree	81	48.20	
Strongly agree	65	38.70	

Table 5: Distribution of the study sample according to their level of anxiety

Anxiety Levels	NO	%	Mean ±SD
None	0	0.00	54.33 ± 8.89
Mild	0	0.00	
Moderate	17	10.10	
Severe	151	89.90	

Table 6: Distribution of the study sample according to their adherence to chemotherapy

Chemotherapy Adherence Level	NO	%	Mean ±SD
Adherence(≤ 5)	35	20.80	7.02±1.98
No adherence (5>)	133	79.20	

Discussion

Systemic treatments, particularly chemotherapy (CT), play an important role in the treatment of cancer. The main goal in the treatment of cancer is to eliminate the disease if possible, prevent recurrence or controlling the progression of disease .Therefore, implementation of planned CT without delay is extremely important for treatment effectiveness. Adherence to chemotherapy, improves the chances of patients for survival. However, psychological disorders such as anxiety and fear are suspected to adversely affect patient’s adherence to CT. For this reason, The question of this study was: Is there a relationship between fear, anxiety and chemotherapy adherence among

patients having breast cancer during COVID-19?

For the relationship between the mean score of fear, anxiety, chemotherapy adherence and personal characteristics of the study sample, a highly statistical significant association was found between patients’ age and mean score of fear, anxiety and chemotherapy adherence . The mean score of anxiety was higher among age group ranged between 40-60 years. This finding is supported by a study conducted in Saudi Arabia by Al-Rahimi et al.,(2021) in a study entitled (Levels and predictors of fear and health anxiety during the current outbreak of COVID-19 in immunocompromised and chronic disease patients in Saudi

Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

Arabia: A cross-sectional correlational study).

In reference to number of missed chemotherapy session, the current study found a statistical significant association with mean score of anxiety and chemotherapy adherence. This finding is supported by a study conducted by Zhu, et al., (2020) who stated that anxiety disorders have negative effects on adherence to chemotherapy in patients with cancer. In the same line, Karacin et al. (2020) highlighted in their study that anxiety and fear were among the three most common reasons for postponing chemotherapy after COVID-19.

In this study, the total mean fear score of COVID-19 was high among breast cancer patients and this correlated positively with mean anxiety score. This finding is consistent with a recent study conducted by Al-Rahimi, Nass, Hassoubah, Wazqar and Alamoudi (2021) and Erdogan, Ekinci, Acar and Goksel (2022) who found high level of COVID-19 fear and anxiety among patients with breast cancer. Also, the current study indicated a positive association between level of anxiety and chemotherapy adherence and this is consistent with Zhu, Tong, Xu, Xiao, Zhang, Zhang (2020) who concluded that anxiety lead to postponement of chemotherapy session.

In the same line, other researchers (Karacin, Bilgetekin, Basal & Oksuzoglu, 2020) conducted a study in Turkey and highlighted that the elevation in anxiety and fear level of COVID-19 pandemic affected the chemotherapy adherence. The same researchers mentioned that after occurrence of first pandemic of the 21st century, the most common cause of postponing chemotherapy is fear and anxiety. Another study conducted by Hemmington, Huang, Coomarasamy, Young,

Consedine & Reynolds (2020) highlighted that fear and anxiety decrease the quality of patients' life and negatively affect the compliance for cancer treatment. This could be due to patients do not know how to protect themselves from the infection during the pandemic which lead to negative effect on adherence to chemotherapy. This illustrates that these patients are in need for teleoncology and teleconsultation with physicians and nurses in order to ensure quality of care in their places especially during pandemics. So, in Egypt there is a need to establish guidelines for implementing teleoncology programs for cancer patients in order to prevent the risk of COVID-19 and consequences of postponement treatment.

Concerning the association between fear, anxiety and chemotherapy adherence and chronic disease. This finding is consistent with study conducted by Alexander et al., (2007) who stated that chronic diseases increase the risk of anxiety. Likewise, Wu and McGoogan (2019) mentioned that patients with cancer are susceptible to increase risk of morbidity and have additional anxiety during COVID-19. Findings of the current study are also supported by Al-Rahimi et al., (2021) who reported that chronic diseases seemed to be a significantly strong predictor of the levels of fear and anxiety among patients with cancer. Another previous study found that more signs of fear and anxiety were encountered in individuals with chronic diseases than those without during a pandemic (Ozdin, Bayrak & zdin, 2020). Moreover, another researcher added that chronic diseases are significantly associated with corona phobia among cancer patients (Ozlem et al., 2022). Unlikely, Karacin et al., (2020) highlighted that there was

Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

no statistical significant relationship between patients with chemotherapy postponement because of fear and anxiety of COVID-19. This could be due to that increasing fear and anxiety from cancer.

In reference to number of missed chemotherapy session, the current study found a statistical significant association with mean score of anxiety and chemotherapy adherence. This finding is supported by a study conducted by Zhu, et al., (2020) who stated that anxiety disorders have negative effects on adherence to chemotherapy in patients with cancer. In the same line, Karacin et al. (2020) highlighted in their study that anxiety and fear were among the three most common reasons for postponing chemotherapy after COVID-19.

The present study found that more than one third of patients strongly agreed regarding feeling of fear because of COVID-19. A study was conducted by Chen et al., (2019) stated that the minority of patients mentioned that they experienced fear when attending the hospital and a lower percentage stated that they received inadequate care because of COVID-19. On the other hand, Al-Rahimi et al. (2021) stated that patients experienced a considerable level of fear. The current study also found that most of patients having breast cancer complained of severe anxiety because of COVID-19. Unlikely, a study conducted by Al-Rahimi et al., (2021) reported that only 19.4% of patients had borderline anxiety.

The present study found that the majority of patients reported no adherence to chemotherapy and this is contradicted with recent study conducted by (Talens et al., (2022) aimed to analyze the influence of COVID-19 on patients' experiences and adherence to orally administered

antineoplastics. They stated that nearly 70% of cancer patients were adhering to medications.

Conclusion

There is a strong positive relationship between fear and anxiety. Chemotherapy adherence among patients having breast cancer during COVID-19 is reduced if patients have high levels of fear and anxiety.

Recommendations

Application of teleoncology and teleconsultations during COVID-19 pandemic are essential and should be implemented to reduce anxiety, fear and enable patients to adhere to chemotherapy sessions. Collaboration with interdisciplinary team (e.g. Physicians, pharmacist, social and support providers...etc) is essential to use a shared protocol to reduced fear and anxiety that affect chemotherapy adherence. Replication of the study in different geographical areas is recommended to generalize the results.

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Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

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Relationship Between Fear, Anxiety and Chemotherapy Adherence among Patients Having Breast Cancer During COVID-19

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