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Sleep Quality, Fatigue and Medication Adherence Among Breast Cancer Survivors At Chennai - A Descriptive Study.

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Abstract:

The cancer survival journey starts for the person at the time of diagnosis and lasts until the end of life, with adverse effects on normal activities. Breast cancer mortality is strongly associated with poor sleep. Fatigation and decreased appetite are the hallmarks of cachexia in terminally ill patients. Inadequate medication adherence may cause alterations in risk-benefit ratios.

Aim: To assess the sleep quality, fatigue, and medication adherence among breast cancer survivors and to find their association with the selected demographic variables.

Methods: This was a descriptive cross-sectional analysis involving 60 samples of OPD medical oncology using a convenient sampling technique and the study duration was one week. Pittsburgh sleep quality index scale, Perform questionnaire, Medication adherence rating scale were used to assess the patients.

RESULTS: The study concluded that 61.67% of the cancer survivors were disordered sleepers, 45.00% of the cancer survivors were having low fatigue score and 71.67% of the breast cancer survivors were having good medication adherence score. There was a strong positive equal correlation between the Sleep Quality Index score and the Fatigue score, which indicates that the quality of sleep raises the fatigue score.

CONCLUSION: Clients suffering with breast cancer should be assessed for sleep quality, which directly helps to reduce the fatigue level. Evidence-based practice interventions like

Exercises, cognitive behavior therapy, yoga, and aerobic exercises could help the patient to have adequate sleep.

Keywords: *Breast cancer, Medication adherence, Sleep Quality, Fatigue, Survivors.*

1. INTRODUCTION:

Being told that you have cancer and will change your life forever. It may be very difficult even to hear anything else that is said after the word “cancer.” At this moment, you have become a survivor of cancer.^[1] The cancer survival journey starts for the person at the time of diagnosis and lasts until the end of life, with adverse effects on normal activities.^[2] A person who is being diagnosed with cancer is commonly called a cancer survivor. “Co-survivorship” is a word to describe a person who cares their loved one with a cancer diagnosis.^[3] Breast cancer is often devastatingly distressing.^[4] Mental health-related adverse reactions, such as sleep disruption, have often been reported both during and after cancer treatment^[5]. A large proportion of survivors of breast cancer experience chronic iatrogenic effects due to treatment, generally involving pain, fatigue, vasomotor symptoms, lymph edema and infertility, all of which can directly have negative effects.^[6]

In Breast Cancer Survivors, Mental health-related adverse reactions, such as sleep disruption, have often been reported both during and after cancer treatment. A large proportion of survivors of breast cancer experience chronic iatrogenic effects due to treatment, generally involving fatigue, constant pain, lymphedema, vasomotor symptoms, and infertility, all of which can directly have negative effects.

Sleep disorders are reported to be one of the top five most burdensome of ongoing issues in breast cancer survivors and it is well reported that 67–90% of breast cancer survivors experience sleep problems.^[7,8] Breast cancer patients with poor sleep disorder are found to have deficiencies in their ability to perform day-to-day activities. Sleep may be compromised at a similar rate in breast cancer patients who are receiving and are not receiving cancer care, although the reasons for sleep disruptions are different.^[9] Daytime exhaustion has been more frequently found in cancer populations.^[10] Sleep quality has worsened about 4 months and over 1 year after the start of treatment.^[11] Some research results have shown that a marked increase in sleep pattern disruptions in early breast cancer patients on chemotherapy and that sleep disturbances subsequently decreased to below baseline levels following completion of chemotherapy, so physicians who treat the patient should be aware of the sleep requirement and regular sleep disturbance screening for breast cancer patients on chemotherapy^[12].

Disease-related exhaustion or unusual tiredness is often the first clinical symptom that patients encounter before they are diagnosed with cancer.^[13] In a study conducted among elderly patients, fatigue can also herald disease progression, fatigue was more serious in those with end-stage disease than in those with early-stage disease.^[14] Between 70 and 95 per cent of patients with breast cancer experience. Fatigue is a good independent survival predictor that offers incremental conventional prognosis measures such as performance status, age ,

sex, and tumour grade.^[16] Patient performance status plays a role both in influencing the prognosis and in deciding the treatment choice for cancer patients. Output status is a ranking that measures the patient's capacity to conduct day-to-day tasks (DLs) without the assistance of others. These ADLs include simple tasks such as dressing, feeding, and bathing, as well as more complex activities such as housekeeping and daily work.^[17] The combination of genetic predisposition, environmental exposure, tumour, and treatment factors makes women at increased risk of fatigue, but the exact mechanisms are not well understood^[18].

Evidence has shown that more depressed patients with breast cancer are less likely to stick to the treatment regimen.^[19] Medication adherence refers to whether a patient is taking medication at the prescribed frequency or continues to take the prescribed medication.^[20] Inadequate adherence to the medication to cause changes in risk-benefit ratios that result in reduced benefits or increased risks and is strongly connected with adverse clinical outcomes and increased healthcare costs.^[21] Treatment of chronic diseases typically requires long-term use of pharmacotherapy and full benefits are not understood because approximately 50 per cent of patients do not take their medication as prescribed^[22].

GLOBOCAN (2018) estimated that about 2 million new cases of breast cancer have been diagnosed worldwide and that more than 6 lakh deaths have occurred due to breast cancer^[23]. Breast cancer is one of India's most common cancers. About 27.7% of new cases of breast cancer have been identified in India (2018). Every 4 minutes a woman is diagnosed with breast cancer and every 8 minutes a woman dies of breast cancer. India has a number of young women diagnosed with breast cancer. According to WHO (2018), cancer is the second most prevalent disease in India responsible for maximum mortality, with approximately 7.8 million deaths each year. Based on the ICMR (2016) estimate, there would be 17.3 lakh new cases of breast cancer by 2020.^[24] The incidence rate in India rose in the early thirties and peaks in the 50-64 year period.^[25] According to the registry, Tamil Nadu had approximately 10,269 cases of breast cancer in 2018, the Madras Metropolitan Cancer Registry in the Adyar Cancer Institute and the Indian Council of Medical Research revealed that breast cancer would become a disease. The objective of this study is to assess the quality of sleep, exhaustion and adherence of drugs among survivors of breast cancer and to classify their relationship with selected demographic variables.

2. METHODOLOGY:

Study Design and Patients: A descriptive cross-sectional study conducted among breast cancer survivors. A total of 60 participants were selected using a convenient sampling technique among those who were attending Medical Oncology OPD at selected Tertiary care centres in Chennai. The inclusion criteria were a) diagnosed as adult cancer patients availing treatment, b) able to understand and speak Tamil, and c) attending the cancer Outpatient and Inpatient department. Necessary ethical approval was obtained vide 1577/P&D-I /TNGMSSH/20 1 7/BMS/003/07/2020. Registered with Clinical trial registry of India no: CTRI/2020/08/027291.

Data collection: Formal permission was obtained from the concerned authorities. Potentially eligible women were informed about the study in their preferred language (Tamil) and both oral and written consents were obtained. The data collection was done with a demographic questionnaire followed by Pittsburgh sleep quality index scale, PERFORM questionnaire and Medication adherence rating scale. The Pittsburgh sleep quality index scale consists of 19 self-rated and 5 items rated by their roommates or bed partner and the components included in it were subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The seven component score yields between 0 – 21 which indicates 0 with no difficulty and 21 with severe sleep disturbances. The PERFORM scale consists of a total of 12 items questionnaire which is based on a five point rating scale. The overall score ranges from < 30 - low fatigue, 31- 45 indicates moderate fatigue and 46-60 indicates high fatigue. The medication adherence rating scale (MARS) consists of 10 items with Yes or No responses. The total score ranges from 0 to 10 with a higher score indicating better medication adherence. About 15 minutes were spent on each participant to complete the tool.

3. Data analysis:

Descriptive statistics were used in which demographic variables in categories were given in frequencies with their percentages. Standardized questionnaires were given in mean and standard deviation. Association between demographic variables and Standardized questionnaires were analyzed using the Chi-square test. The correlation was obtained using inferential statistics on Karl Pearson Correlation Coefficients of which $P < 0.05$ was considered statistically significant.

4. RESULTS:

PATIENT CHARACTERISTICS:

About 60 patients participated in this study. 61.67% of the Breast Cancer Survivors were more than 40 years of age and were having healthy BMI. More than half of the participants (60%) had their primary education and all the participants (100%) were married. 76.67% were Hindus and the majority of (90%) them lives in Urban area. Most of the breast cancer survivors (83.33%) were Homemaker and more than half (55%) of them were having an income of less than Rs. 5,000/pm. The majority of (90%) of the participants belongs to a nuclear family and 58.33% were not having any comorbidity. About 65% of them stays with two to four other persons in the family and 98.33% of participant's married life span was more than ten years, and 90% were having children. [Table 1]

Based on the clinical variables 90% of people were diagnosed with breast cancer less than five years. Among those, 40% were in Stage III and more than half (53.33%)of them were having a tumor in the right breast. Most of them (58.33%) were undergoing chemotherapy and about 45% were independent [Table 2].

Table 1: Demographic variables of Breast Cancer Survivors.

Demographic variables		No. of Breast cancer survivors	%
AGE	< 30 years	2	3.33%
	31 -40 years	21	35.00%
	>40 years	37	61.67%
BMI	Underweight	5	8.33%
	Healthy weight	37	61.67%
	Overweight	15	25.00%
	Heavy overweight	3	5.00%
EDUCATION	Informal Education	15	25.00%
	Primary Education	36	60.00%
	Higher secondary School	6	10.00%
	Graduate	3	5.00%
	Professional	0	0.00%
MARITAL STATUS	Married	60	100.00%
	Divorced/separated	0	0.00%
	Widowed	0	0.00%
RELIGION	Hindu	46	76.67%
	Muslim	2	3.33%
	Christian	12	20.00%
	Others	0	0.00%
RESIDENTIAL AREA	Urban	54	90.00%
	Semi urban	4	6.67%
	Rural area	2	3.33%
EMPLOYMENT STATUS	Full time	7	11.67%
	Not working	2	3.33%
	Homemaker	50	83.33%
	Disabled	0	0.00%
	Self employed	1	1.67%
	Students	0	0.00%
	Others	0	0.00%
MONTHLY FAMILY INCOME	<Rs. 5000	33	55.00%
	Rs.5000-10000	18	30.00%
	>Rs.10000	9	15.00%
TYPE OF FAMILY	Nuclear Family	54	90.00%
	Joint Family	6	10.00%

	Extended Family	0	0.00%
COMORBID DISEASE CONDITION	Arthritis	1	1.67%
	Diabetes mellitus	10	16.67%
	Hypertension	9	15.00%
	Heart disease	2	3.33%
	Neurologic problems	0	0.00%
	Thyroid disease	2	3.33%
	Asthma	1	1.67%
	Nil	35	58.33%
COHABITATION STATUS	Lives alone or with one other person	4	6.67%
	Stays with 2 to 4 other persons	39	65.00%
	Stays with 5 or more other persons	17	28.33%
DURATION OF MARRIAGE?	Less than or equal to 10 years	1	1.67%
	More than 10 years	59	98.33%
	Unknown	0	0.00%
CHILDREN?	Yes	54	90.00%
	No	6	10.00%

Table 2: Clinical Variables of Breast Cancer Survivors

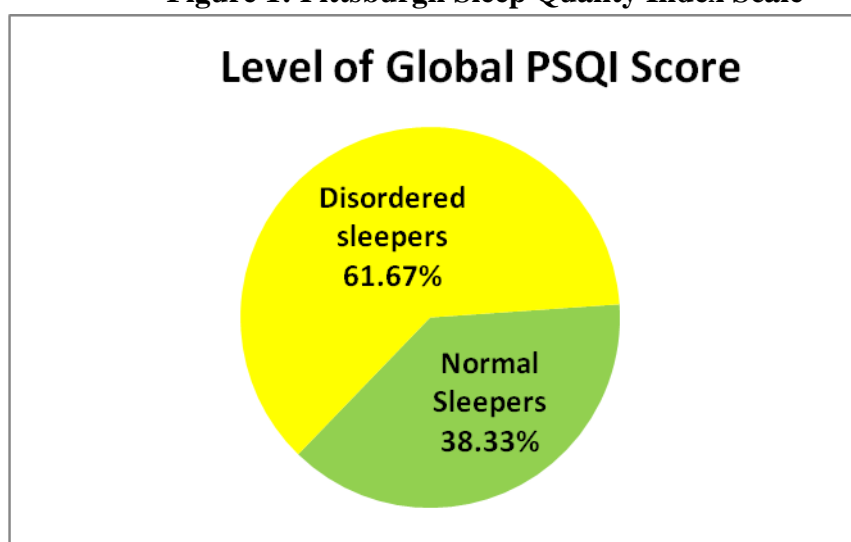
Clinical Variables		No. of Breast cancer survivors	%
DURATION SINCE DIAGNOSIS	Less than five years	54	90.00%
	More than five years	6	10.00%
STAGES OF CANCER	I	12	20.00%
	II	9	15.00%
	III	24	40.00%
	IV	10	16.67%
	Recurrence	5	8.33%
TUMOR	Left breast	27	45.00%

LOCATION	Right breast	32	53.33%
	Both	1	1.67%
CURRENT ANTICANCER TREATMENT	Surgery	11	18.33%
	Chemotherapy	35	58.33%
	Hormonal therapy	0	0.00%
	Radiation therapy	14	23.33%
PERFORMANCE STATUS	Fully dependent	8	13.33%
	Partially Dependent	25	41.67%
	Independent	27	45.00%

SLEEP QUALITY SCORE:

Using the Pittsburgh sleep quality index scale (PSQI), sleep quality of the breast cancer survivors were assessed which showed about 38.33% of the Breast Cancer Survivors had normal sleep and 61.67% of the cancer survivors were disordered sleepers [Figure 1].

Figure 1: Pittsburgh Sleep Quality Index Scale

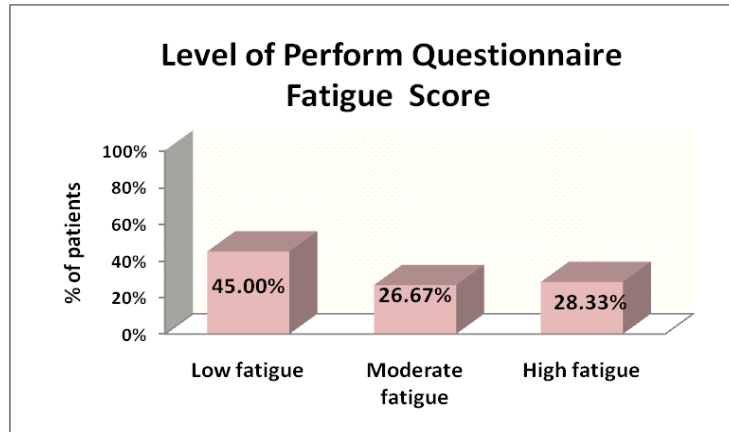


FATIGUE SCORE:

Based on the PERFORM Questionnaire, the fatigue level of the breast cancer survivors were assessed in which about nearly half (45.00%) of the Breast Cancer Survivors were having low fatigue score, 26.67% were having moderate fatigue score and 28.33% were

having high fatigue score[Figure 2]. In general, 55% of the Breast Cancer Survivors were suffering from fatigue.

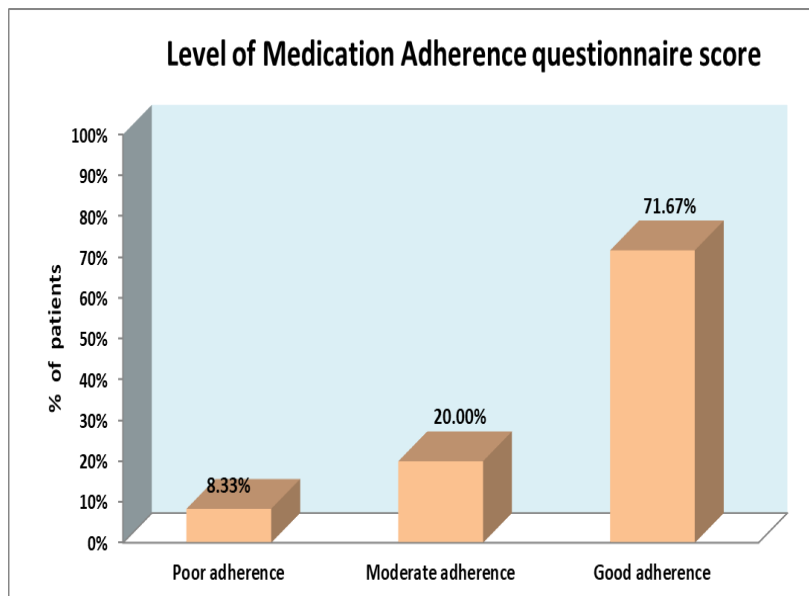
Figure 2: PERFORM Questionnaire Fatigue score



MEDICATION ADHERENCE SCORE:

The medication adherence level of the participants were assessed using the medication adherence rating scale. 8.33% of the Breast Cancer Survivors were having a Poor adherence score, whereas 20.00% of them were having Moderate adherence score and most of 71.67% were having a Good adherence score. [Figure 3]

Figure 3: Medication Adherence Questionnaire Score



When analyzing the association between the Demographic Variables and Sleep Quality Index, the Breast Cancer Survivors who were elderly and those who had more

income were having a normal Sleep Quality Score than others. Breast Cancer Survivors whose duration of diagnosis was more than 5 years and Survivors who were under the independent performance of their activities were having normal sleep quality scores than others.

The association between the Demographic Variables and Fatigue showed that elderly Breast Cancer Survivors patients and those who were more educated were having a low level of fatigue score. The Breast Cancer Survivors who were diagnosed more than 5 years back and those who were independent performers in their activities were having more low-level fatigue.

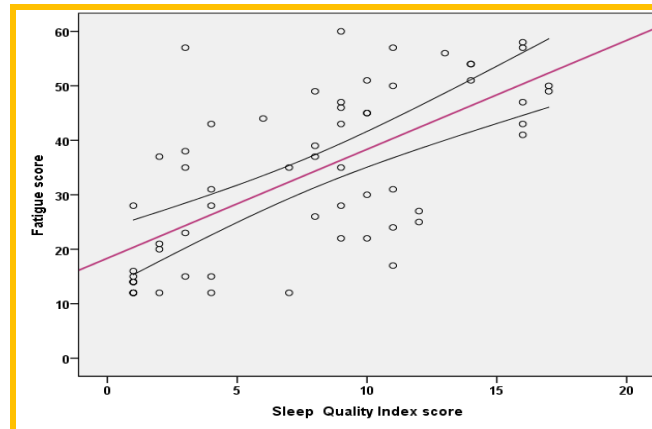
The association between the Demographic Variables and Medication Adherence among Breast Cancer Survivors resulted that elderly women, participants with more income, highly educated, and those who can perform their activities on an independent basis were having a good level of adherence score than others.

The correlations between the domains were calculated by using Karl Pearson Correlation Coefficient . There was a significant positive fair correlation between Sleep Quality Index Score and Fatigue Score [Figure 4], which means when sleep level increases there was a significant decrease in their fatigue. The remaining domains are having negative fair correlation as mentioned in [Table 3].

Table 3: Correlation Between Sleep Quality Index, Fatigue And Medication Adherence Score

Correlation between	Mean score Mean \pm SD	Karl Pearson Correlation coefficients	Interpretation
Sleep Quality index Vs Fatigue score	7.75 \pm 5.06 33.85 \pm 15.32	r= 0.34, p=0.001***	Fair , positive correlation
Sleep Quality index Vs Adherence score	7.75 \pm 5.06 8.20 \pm 1.99	r=- 0.25 , p=0.001***	Fair, Negative correlation
Fatigue score Vs Adherence score	7.75 \pm 5.06 33.85 \pm 15.32	r= - 0.29, p=0.001***	Fair, Negative correlation

Figure 4 : Scatter diagram shows the significant positive fair correlation between Sleep Quality index score and Fatigue score



5. DISCUSSION:

The participants in the study were breast cancer survivors. Most of them were over 40 years of age and had a good weight and BMI. Most of them had their primary education, and they were all married. Most of them had no conditions of co-morbidity. In clinical factors, the majority of survivors of breast cancer were diagnosed less than five years ago with one-sided breast cancer and chemotherapy.

Although evaluating Sleep Quality, Exhaustion and Medication Adherence among Breast Cancer Survivors, our study found that the overall percentage of the Global PSQI score was 36.90%. Around one-third of Breast Cancer Survivors had disrupted sleep habits. The findings of our research were consistent with another study conducted by Rami Fakih et al (2018) at the American University of Beirut Medical Center to assess the prevalence and severity of sleep disturbances among patients with early breast cancer and to find that patients with breast cancer encountered increased sleep disturbances during their treatment phase^[26]. In accordance with the Fatigue score, Breast Cancer Survivors were minimally graded as "I spent the whole day sitting down because of my tiredness" (45 %) and given the highest score in "I've been really slow doing my normal tasks" (61.80 %) even though the disease disrupts their life routines devastatingly, Breast Cancer Survivors are trying to do their day-to-day activities slowly as well as slowly. The average percentage of exhaustion levels among survivors of breast cancer was 56.42%. This was supported by a cross-sectional observational study conducted by Karthikeyan G et al (2012) who found that there was a significant level of fatigue among patients receiving cancer chemotherapy^[28]. Alok G et al.(2019) who assessed the expectations, severity and consequences of cancer-related fatigue in breast cancer survivors and found that the development and persistence of fatigue remains a major health concern^[29].

Medication non-adherence has been associated with poor health outcomes. In our sample, the percentage of MAQ scores was 73.33%. Most Breast Cancer Survivors had a

strong adherence rate. They were very much pursuing the adherence to medicine recommended by a psychiatrist who believed that the use of medications would cure their illness. The above statement is supported by a study conducted by Linda Bouwman et al (2017) which found that more than 50 per cent of cancer patients adhered to their cancer drugs^[30]. Similarly, Emma E et al.(2016) conducted a descriptive study among survivors of breast cancer, and it was found that only a small number of women had barriers to adherence to medications, and most of them had strong adherence to drug therapy^[31].

Many aspects of exhaustion, such as physical , cognitive and emotional fatigue, are correlated with disrupted sleep patterns. Adequate sleep is mandatory for patients with breast cancer, not only to minimise fatigue but also to maintain a reasonable quality of life and to withstand treatment^[32]. Breast Cancer Survivors suffering from sleep disruptions had more fatigue and it was statistically reported that there was a strong equal link between the Sleep Quality Index Score and the Fatigue Score. Apart from the above argument, perfect adherence to the drug helps cancer survivors conquer the battleship quickly and many of the patients adhered to the medication recommended by the physicians. Small nurses led initiations such as cognitive behavioural therapy, yoga, aerobic exercises will enable breast cancer survivors to encourage sleep efficiency, which directly reduces fatigue levels and increases the quality of life positively^{[33][34]}.

6. RECOMMENDATIONS:

1. Based on the study result, the nurse investigator can encourage the nurses to concentrate on Breast Cancer Survivors' Quality of Life.
2. The generalization of the study results can be made further replication of the studies in various settings and larger populations.
3. Continuing nursing education on how to maintain breast cancer survivor's quality of life for Nurses.
4. Evidence-based practice on the Wellbeing of Cancer clients.

7. CONCLUSION:

This study findings illustrated that disturbed sleep quality will directly increase the fatigue level. Nurses play a prominent role in educating the breast cancer survivors on Sleep, Nutrition, and Quality of life. Nurses whilst treating the disease should be aware of the importance of sleep and as a recommendation, some techniques like cognitive behavioral therapy, yoga, and aerobic exercise could be inculcated in clients' care in consultation with the Health care team. Along with this to overcome the disease burden, medication adherence must be checked routinely as early as possible for client's speedy recovery.

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Conflicts of Interest:

There are no conflicts of interest.

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