

# Cognitive Functioning, Self-Esteem, and Body Image in Breast Cancer Survivors

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## Abstract

**Context:** Breast cancer is a chronic disease in which cells in breast tissue multiply uncontrolled, typically resulting in a lump. India has a predominant young population, and women in the age group of 30–50 being diagnosed with breast cancer is on the rise. Their survival rates are also rising, owing to the treatment regimens which commonly include chemotherapy. Breast cancer survivors have the challenge of dealing with side effects of treatment such as cognitive impairment, along with alterations in the appearance – breast asymmetry, changes in skin texture and sensitivity, impacting self-esteem and body image. **Aim:** The present study aims to explore the cognitive functioning, self esteem, and body image of women with a history of breast cancer. **Settings and Design:** The present study is a cross-sectional, comparative study conducted on breast cancer survivors in an urban area of Kolkata, who were selected using purposive sampling method. **Subjects and Methods:** A total of sixty females – thirty breast cancer survivors and thirty normal counterparts, aged 30–50 years, were included. Neuropsychological tests, Rosenberg Self Esteem Scale, and Body Image Scale were administered. **Statistical Analysis:** Descriptive and inferential statistics were computed using SPSS 20 software. **Results:** The results of the study show the presence of significant difference between the two groups. **Conclusion:** Thus, with a rise in the number of breast cancer survivors, it becomes imperative to understand the negative impact of the various treatments and provide timely interventions, thereby ensuring better quality of life and adequate psychological and emotional support for them.

**Keywords:** Breast cancer, chemotherapy, cognitive impairments, psychosocial oncology, self esteem

## INTRODUCTION

Cancer refers to cells that grow out of control and invade other tissues. It tends to be a leading cause of death worldwide, and there has been an increase in the occurrence of cancer everywhere. Breast cancer is cancer that forms in the cells of the breasts and can occur in both men and women, but it is far more common in women. An estimated 70,218 women died of breast cancer in India, for the year 2012, the highest in the world for that year.<sup>[1]</sup> There has been a rise in the cases of breast cancer<sup>[2]</sup> in the age group of 30–50, in India, and the same is likely to increase, as predominantly India has a young population. The majority of the women diagnosed with breast cancer receive some form of chemotherapy and/or hormonal therapy as part of their treatment program, resulting in a greater

number of survivors on the one hand, while at the same time often leading to an increase in the number of women living with the long-term side effects of cancer and its treatment.

One of the most common side effects is often seen to be cancer-related cognitive impairment. There tends to be the largest body of empirical evidence about the cognitive aspects of breast cancer and its treatments, compared to other cancers. Approximately 13%–70% of people who undergo chemotherapy experience some level of postchemotherapy cognitive impairment especially in the domains of memory, attention, executive function, “processing speed,” visual and verbal memory, and language relative to people without

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cancer.<sup>[3,4]</sup> Chemo brain is a term used to describe the problems in thinking and memory that can occur during and after cancer treatment.<sup>[5]</sup> Chemotherapy has been found to result in brain atrophy and white-matter pathology, in breast cancer survivors.<sup>[6,7]</sup> Other studies have further shown reductions in gray matter, primarily in bilateral frontal regions and the hippocampus, post chemotherapy. There tends to be variation in problem manifestation, as some patients report mild cognitive problems that necessitate a bit more effort at concentration and memory without a marked effect on activities of daily living and quality of life.<sup>[8]</sup> On the other hand, some patients may report more severe impairments that interfere with memory and impair daily psychosocial functioning. In a review of the cases of breast cancer survivors who had been treated with chemotherapy in the previous 10 years, it was found that cognitive deficits were still present even a decade after treatment and that patients treated with adjuvant chemotherapy were much more likely to perform poorly on neuropsychological tests.<sup>[9]</sup> Thus, cognitive impairment experienced post chemotherapy can be severe and long-lasting, and further impair their daily life, thereby necessitating timely identification and remediation to prevent the negative consequences.

Further, there tend to be serious alterations in the appearance of patients, including asymmetry of the breast and changes in skin texture and sensitivity, post treatment.<sup>[10]</sup> Breasts are considered important for female beauty and are further integral in the conceptualization of sexuality, constituting the female body image, which includes individual self-perception and observation of the reaction of others.<sup>[11]</sup> Body image is made up of the perceptions, thoughts, and feelings a person has about his/her own body.<sup>[12]</sup> Changes in the body image and self-esteem of the breast cancer survivors tend to be a most likely consequence of the physical changes, owing to majorly to the localization of the tumor in the breasts, which tends to be followed by surgeries and chemotherapy. Several such physical changes can occur – alterations in the skin texture and sensitivity, weight changes, and breast asymmetry and size. It becomes important to evaluate the body image to allow better comprehension of the overall stress and tension experienced by these individuals, to understand how it has an impact on ones self-esteem and also to gain insights into any reformulation of body image by them. Thus, with improved treatment provisions, the number of breast cancer survivors is increasing, thereby necessitating the timely identification of cognitive impairments, body image, and self-esteem aspects to guide interventions for the them, as these changes often have psychological and emotional impacts and in general decrease their overall quality of life. This would facilitate in planning interventions keeping in focus the plasticity of the brain and the possibility of restructuring negative self-perceptions. The aim of the study is to compare breast cancer survivors, within 6 months of them being exposed to chemotherapy and normal counterparts with respect to their cognitive functioning, body image, and self-esteem. The study demonstrates significant

findings about the psychological and cognitive changes associated with breast cancer and its treatment. The findings of this study can further be applied in the clinical settings for the management of individuals with breast cancer, and it is likely to be of great interest to the researchers, clinicians, and trainees working in the field.

## SUBJECTS AND METHODS

The present study is a cross-sectional, comparative study conducted to explore the working memory, cognitive flexibility, fluency, body image perception, and self-esteem of women with breast cancer and their normal counterparts, within 6 months of them being exposed to chemotherapy, residing in an urban area of Kolkata, who were selected using purposive sampling method, to ensure that the sample selected was representative of the population, that is breast cancer survivors. The total sample consisted of sixty individuals, aged 30–50 years, with thirty breast cancer survivors and thirty normal counterparts. Some of the breast cancer patients were referred by physicians and some were recruited from the community. Eighteen participants were at Stage I of cancer, as diagnosed by the oncologists, and the rest 12 in Stage II of cancer. All the participants were educated up to Class VIII or above, were married, and had no history of any comorbid medical, psychiatric, neurological, or organic condition.

After taking informed consent from each of the participants, a sociodemographic and clinical datasheet which was prepared for this work with a view of eliciting relevant information was filled in. Several tools were then used to assess the chosen psychological and neuropsychological variables. Cognitive functioning was assessed using four verbal tests – the digit span test, Controlled Oral Word Association test, Animal Names Test, and STROOP Neuropsychological Screening Test and one paper pencil test – the trail-making test. Time taken to complete the test and the participants' responses were noted down accurately, and later analyzed and scored.

For assessing the body image and self-esteem, two questionnaires were used – the Body Image Scale and the Rosenberg Self Esteem Scale. Responses on each of the items were scored and were interpreted according to the respective norms [Table 1]. After obtaining informed consent and describing the purpose of the study to the participants, the selected tests were administered following a sequence, beginning with the sociodemographic and clinical data sheet, followed by the neuropsychological tests and lastly the psychological questionnaires. Sufficient amount of rest was provided in between, whenever required, to prevent the creeping of fatigue, boredom, and monotony on the part of the subject. Ethical consideration and confidentiality was maintained. The data thus obtained were subjected to statistical treatment. Descriptive statistics in the form of mean, standard deviation, and percentage were computed, and inferential statistics in the form of *t*-test were calculated to observe if there was any significant difference between the groups with

respect to the variables. For computing the statistics, SPSS Statistics for Windows, version 25. 0 (SPSS Inc., Chicago, Ill., USA), statistical software was used.

## RESULTS

From Table 2, it can be seen that the mean age for the breast cancer survivors was 43 years and the average duration of illness for the breast cancer survivor group was 12 months.

From Table 3, it can be seen that there was a significant difference between the two groups with respect to categorical fluency, body image, and self-esteem. Further, breast cancer survivors tended to have better body image and higher self-esteem as compared to their normal counterparts.

## DISCUSSION

The incidence and prevalence of breast cancer are rapidly rising, making it a worldwide health problem. Advances in

cancer therapies have resulted in increased survival; cancer patients and survivors face major challenges associated with treatment-related side effects which may include either cognitive impairments or psychological issues, or both, which, in turn, affects their psychosocial functioning and quality of life.<sup>[20]</sup> Thus, it becomes important to understand these changes post treatment to provide timely interventions for the same.

In the present study, it was seen that, overall, the cognitive functioning of both the groups was intact as had been found in a previous study wherein neuropsychological testing of breast cancer patients revealed cognitive impairments in some not all domains, thereby reflecting the selective nature of the cognitive impairment.<sup>[21]</sup> The intact functioning in the breast cancer survivors could also be attributed to the time passed since the treatment, as it has been seen in several studies that on post follow-up studies breast cancer patients did not have any cognitive impairment as such.<sup>[22]</sup> However, when compared to the normal participants, the breast cancer survivors showed poor performance in terms of certain aspects of cognitive functioning, particularly in domains of attention, cognitive flexibility, and categorical fluency. There was a significant difference between the two groups with respect to categorical fluency. The poorer categorical fluency could indicate underlying problems in executive functioning as well as in verbal memory especially retrieval. This could reflect the neurotoxicity that is often associated with chemotherapy, and approximately 20%–30% of people who undergo chemotherapy experience some level of postchemotherapy cognitive impairment.<sup>[23]</sup> It has also been seen in several imaging studies that cognitive impairment seen in patients with cancer may be directly related to neuroanatomical changes. In a study conducted, it was also found that there tends to be decreased frontal, parietal, and occipital white-matter integrity postchemotherapy compared to healthy controls.<sup>[24,25]</sup> Chemotherapy is associated with functional and structural changes in prefrontal cortex especially which tends to be very important for intact executive functions, as reflected in the present study also. Further, the psychological burden associated with the illness as well tends to hamper overall cognitive functioning as well.

Contrary to the available literature, in the present study, breast cancer survivors tended to have better body image and higher self-esteem as compared to their normal counterparts as can be seen in Table 3, thereby highlighting the mental acceptance and adaption they make to the posttreatment changes that impact both their body and mind, which could also be a result of the length of time elapsed between the treatment and assessment. However, when compared with normative data, their body image was found to be poor, which could be a result of the surgery and physical changes associated with the treatment they undergo. This is also in line with a study, which showed that patients who undergo breast cancer treatment seem to experience high body image dissatisfaction rates until 2 years after treatment.<sup>[26]</sup> In the present study, the poor body image may also further reflect their satisfaction or dissatisfaction with one's body prior to and postsurgery. Further, overall, the

**Table 1: The assessment details**

Test	Area
Digit Span Test <sup>[13]</sup>	Attention
Controlled Oral Word Association test <sup>[14]</sup>	Semantic fluency
Animal Names Test <sup>[15]</sup>	Categorical fluency
STROOP Neuropsychological Screening Test <sup>[16]</sup>	Response inhibition
Trail-making test <sup>[17]</sup>	Cognitive flexibility
Body Image Scale <sup>[18]</sup>	Body image
Rosenberg Self-Esteem Scale <sup>[19]</sup>	Self-esteem

**Table 2: The age and duration of illness of the sample**

Variables	Mean ± SD		t	P
	Breast cancer survivors	Normal controls		
Age (in years)	43±5.10	40±6.23	1.76	0.82
Duration of illness (in months)	12±3.03	NA	NA	NA

SD: Standard deviation, NA: Not available

**Table 3: The details of neuropsychological and psychological measures of the sample**

Variables	Mean ± SD		t	P
	Breast cancer survivors	Normal controls		
Attention	4.96±0.49	5.06±0.58	0.71	0.47
Working memory	3.76±0.67	6.03±0.49	1.74	0.86
Phonemic fluency	5.80±1.76	5.80±1.76	0.00	1.00
Categorical fluency	7.60±2.04	11.06±2.63	2.40*	0.01
Cognitive flexibility	247.86±57.24	229.86±31.44	1.52	0.13
Response inhibition	63.00±17.17	54.15±12.34	2.49	0.20
Body image	16.00±3.09	22.78±3.57	1.77*	0.00
Self-esteem	19.00±4.29	14.20±3.94	3.41*	0.01

\*Indicates values were significant at the 0.05 level of significance. SD: Standard deviation

sample tended to have lower body image and self-esteem when compared to norms, as many a times, it is seen that during the time period of 30s–50s women tend to become self-critical and perceive themselves as less attractive physically owing to their increasing age and related bodily changes in general. Although women of all ages tend to have more similarities than differences in their body image experiences,<sup>[27]</sup> individual differences exist, as has been seen in the present study.

## CONCLUSION

Our study findings highlight that there tends to be psychological as well as cognitive changes in breast cancer survivors, which could be due to several psychosocial as well as treatment-related factors. Timely identification of these changes thus becomes important to ensure an improved quality of life and increased overall productivity for the survivors. These as well as other psychological variables thus need to be explored in greater depth, and across individuals of various age groups to understand their impact.

## Limitations

Even though in the present study the impact of breast cancer and chemotherapy on the cognitive functioning, body image, and self-esteem of breast cancer survivors was established, there may be other variables such as experience of intimacy, self-concept, personality, and mental health-related conditions that could possibly be associated with the illness and its treatment, and thus need further exploration. Further studies could also be replicated using a larger sample size, to ensure greater generalizability of findings.

## Clinical implications

The results of the study suggest that there tends to be an impact of breast cancer and chemotherapy on the cognitive functioning, body image, and self-esteem of breast cancer survivors. Thus, a proper understanding of these changes can lead to improved health-care approaches as well as timely interventions, which can aid in the clinical management of the breast cancer survivors, involving a multidisciplinary team for providing the intervention. Although in the present study they tend to show positive body image and higher self-esteem, these are areas that still need to be explored and addressed, as the changes that breast cancer and its treatment bring about tend to have a significant mental as well as physical impact. Thus, future studies can focus on developing specific intervention packages that target the cognitive and psychological changes associated with breast cancer and see their efficacy.

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## Conflicts of interest

There are no conflicts of interest.

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