

## CASE REPORT

**Pedometer Based Exercise Program for a Patient with Breast Cancer Receiving Chemotherapy- Case Report**

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**Abstract:**

This was a case study of a 47-year-old female who was planned for chemotherapy post her breast cancer diagnosis. The purpose of this study was to observe the effect of a pedometer-based exercise program on Cancer-Related Fatigue (CRF), Quality of Life (QoL), Functional capacity and body composition on patients with breast cancer receiving chemotherapy. A pedometer-based walking program was administered for duration of 7 weeks. After 7 weeks of intervention, which includes 2 follow-ups, potential changes were observed in all the outcome measures.

**Keywords:** Pedometer, Cancer-Related Fatigue, Breast Cancer, Chemotherapy

**Introduction**

Cancer, anti-cancer treatment and its treatment-related side effects such as Cancer Related Fatigue (CRF) and physical inactivity has led to an increase in the number of cancer survivors with various physical limitations [1]. Breast cancer is the 2<sup>nd</sup> most common cancer seen in India with an incidence rate of 25.8 per 100,000 women and a mortality rate of 12.7 per 100,000 women [2]. A study in 2012 stated that 98.30% patients who are treated with chemotherapy have been found to be complaining of CRF [3]. CRF as defined by National Comprehensive Cancer Network- "It is a distressing, persistent, subjective sense of tiredness or exhaustion related to cancer or its

treatment that is not proportional to recent activity and interferes with usual functioning [1]." A meta-analysis in 2017 found that exercise and psychological interventions are the most potent intervention strategies in the management of CRF [4]. Despite these promising epidemiological data, only a few exercise interventions trials have so far been conducted in this patient population[5]. Hence the objective of this case report was to find the effectiveness of a pedometer based exercise program in a patient with breast cancer receiving chemotherapy.

**Case Report:**

The client was a 47 year old female who provided written informed consent to participate in this study. She was diagnosed with moderately differentiated infiltrating ductal carcinoma of the right breast with T1N1M0 stage. The client completed six conventional chemotherapy treatments 3 week apart consisting of the Docetaxel regimen that includes: Chemodoc Injection- 120 mg in 500 ml NS glass bottle, Taxotere (Docetaxel) injection- 120 mg in 500 ml NS glass bottle, Wintaxel- 60 mg/m<sup>2</sup>. With physician and the client's consent, two days before the administration of chemotherapy drugs, the client was explained about the protocol. The client

underwent routine laboratory testing for any other co-morbidities. Parallel with the chemotherapy treatment, exercise intervention was also administered. The exercise intervention was a 6 weeks home-based intervention with the standard hospital care [6]. The exercise was given for 5 days a week for a duration of 6 weeks. The client was given a target of 10,000 steps. The number of steps taken by the client on day 1 was recorded and patient will be asked to increase the number of steps by 5% each week. To keep a track on the step count client was given an Omron Pedometer and a diary to record the steps every day. The client was also explained that she can terminate the session if they observe any adverse symptoms like dyspnea, excessive fatigue, palpitations etc. The outcome measures were assessed at the following 3 time points that is at the beginning of chemotherapy (Baseline), at the 2<sup>nd</sup> cycle of chemotherapy and at the 3<sup>rd</sup> cycle of chemotherapy. Brief Fatigue Inventory (BFI) was used to rapidly assess the severity and impact of cancer-related fatigue. Quality of Life was assessed through Functional Assessment in Cancer Therapy-Breast (version 4)

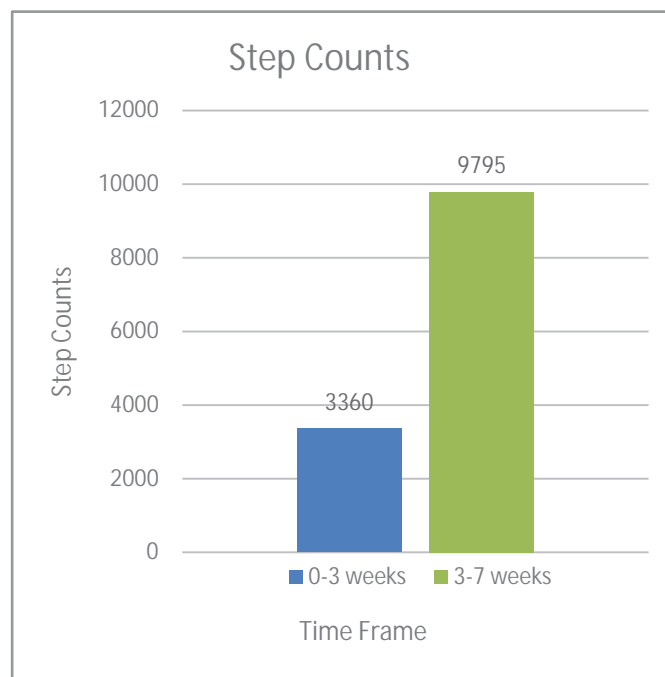
(FACT-B) which is specifically designed for the use with patients with Breast Cancer. Functional capacity was evaluated with the 6 Minute Walk Test (6MWT) following the American Thoracic Society Guidelines. Body Composition was assessed by Bioelectrical Impedance Analyzer (BIA). On each admission of client for chemotherapy the outcome measures were assessed and compared with baseline. Figure 1 shows the step counts of the client from the beginning of the study till the end of the study (3 chemotherapy cycles). Table 1 and figure 2 shows the scores of the four outcome measures during the first three chemotherapy cycles. The scores of BFI show gradual increase in the patient's level of fatigue from 0/90 at the baseline to 16/90 and 14/90 in respective 3<sup>rd</sup> and 6<sup>th</sup> week as the step target given is moderately challenging. Increase in the fatigue levels in the successive sessions can be attributed to the increase in the physical activity (no. of steps) and the side effects of the chemotherapy drugs. As per the scores obtained from the client, it is evident that there is subsequent increase in the scores which signify a

**Table 1: Showing the Scores of All Outcome Measures**

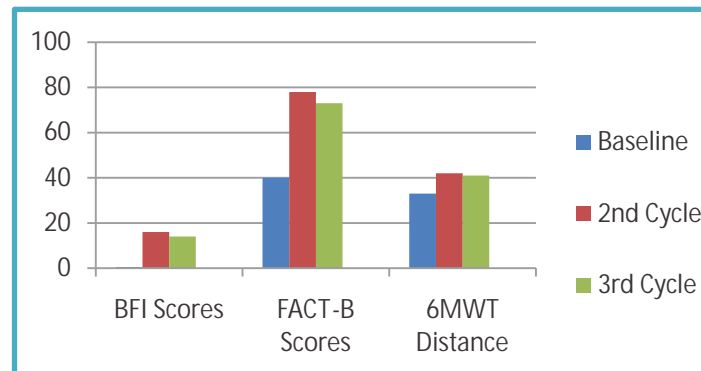
Outcome Measures	Baseline	3 Weeks	7 Weeks
Scores of BFI	0/90	16/90	14/90
Scores of FACT-B	40/148	78/148	73/148
6MW Distance	390mts	420mts	430mts
Body Composition	Total Fat: 33.50% Sub-cut Fat: 28.50% Visceral Fat: 6.50% SkeletalMass:33.50%	35.20% 29.0% 6.0% 22.80%	34.10% 29.60% 8.50% 23.10%

better Quality of Life (QoL) (73/148) when compared with baseline score (40/148). The Social Well Being (SWB) and the Emotional Well-Being (EWB) subscales are the ones which have shown drastic increases when compared with the baseline. EWB and SWB is considered to have more importance than other subscales for females with breast cancer because they include all components related to the condition [7]. Greater the number of steps the client takes each day, the more distance the client will be able to complete during the consecutive admissions as the endurance and threshold to fatigue gradually starts increasing. Interestingly, the client could increase 40mts when compared with the distance covered during baseline (390 mts) and 6<sup>th</sup> week

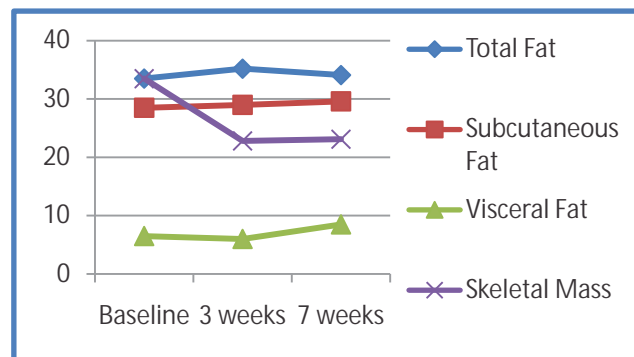
(430 mts). According to Bohannon *et al.* in 2017, the minimal important difference should be 14.0 to 30.5 mts [8]. Total body fat and sub-cutaneous fat show nearly 1% increase, whereas significant increase is seen in visceral fat from 6.50% to 8.50% at baseline and 6<sup>th</sup> week respectively, as shown in Fig. 3. Similarly, drastic decrease is seen in Skeletal mass from 33.50% to 23.10% at baseline and 6<sup>th</sup> week respectively. Study in 2014 stated that alteration in body composition is usually studied post diagnosis of breast cancer to focus on adiposity rather than body weight *per se* [9]. Therefore, with an increase in level of fatigue patient's global health status has improved to around 45% when compared with the baseline level.



**Fig. 1: Average Step Counts of the Client from 0-3<sup>rd</sup> Week and 3<sup>rd</sup> -7<sup>th</sup> Week**



**Fig. 2: Compares the Scores of Three of the Outcome Measures at Baseline, during the 2<sup>nd</sup> Cycle and during the 3<sup>rd</sup> Cycle of Chemotherapy**



**Fig. 3: Shows the Change in Body Composition Parameters at Baseline, during the 2<sup>nd</sup> cycle and during the 3<sup>rd</sup> Cycle of Chemotherapy**

**Discussion:**

This case study indicates how exercise can have a positive impact on fatigue, QoL, and functional capacity. Our client showed increase in fatigue which is justified by the increase in the physical activity that is, the step count she managed to complete during the study. A study which was done by Gokal *et al.* in 2018 on breast cancer survivors treated with chemotherapy, concluded that the amount of physical activity performed is directly proportional to the psychosocial well-being [10]. This result is directly reflected in the FACT-B scores of our client from which we can infer that

her overall QoL has significantly improved. The potential to revamp physical capacity and function during a time in which these outcomes are presumed to decline is an important clinical finding. This is quantified by the increase in 40 mts of distance in the 6MWD [8]. In addition, there is a decrease in the skeletal mass and a marked increase in visceral fat in the client during the study. Makari-Judson *et al.*, in their study highlighted that there was a significant weight gain observed after chemotherapy [9].

**Conclusion:**

Exercise during chemotherapy helps in maintaining physical capacity but intervention studies with larger sample sizes of patients receiving chemotherapy for their breast cancer are required in order to strengthen current findings.

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