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THE EFFECTS OF PHYSICAL THERAPY INTERVENTIONS ON FATIGUE MANAGEMENT IN CANCER SURVIVORS

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Abstract

The main objective of this systematic review is to organize the existing data on physical exercise regimens and their impact on (1) physical performance results, (2) reported tiredness, and (3) quality of life (QoL) in patients undergoing first therapy for breast cancer. A comprehensive literature search, following the PRISMA criteria, was conducted utilizing four databases (Web of Science, Cochrane Library for Clinical Trials, PubMed, and Medline). The chosen studies were assessed for their methodological quality, and information about physical performance, quality of life, and weariness was collected. Twenty-eight randomized controlled trials (RCTs) were included. The study found several treatment methods used during the first treatment, including radiation therapy, chemotherapy, and combination therapy. Additionally, many forms of physical training treatments were discovered, such as aerobic endurance exercise, strengthening programs, or a combination of both. Consequently, the findings were organized into clusters based on the indicated grouping. This included identifying all important outcomes linked to physical performance (such as 6-minute walk test or peak oxygen uptake), quality of life (measured by surveys), and tiredness (also assessed through questionnaires). Various fitness routines are accessible for rehabilitating breast cancer patients during adjuvant treatment. In general, engaging in resistance training alone or combining it with cardiovascular endurance training yields optimal outcomes, particularly in terms of physical performance and perceived exhaustion.

Keywords: Physical therapy, breast cancer, review, treatment, interventions.

1. Introduction

Breast cancer is a very destructive illness and is the most often detected form of cancer in women [1]. The lifetime probability of receiving a breast cancer diagnosis is 1 in 8 [2]. The

implementation of enhanced screening and awareness initiatives has resulted in a twofold increase in breast cancer survival rates over the last forty years [3]. Furthermore, the use of innovative and individualized therapeutic strategies has also had a role in the rise in overall survival rates [4,5,6,7,8]. Currently, the 5-year relative survival rate for breast cancer in Europe is around 83% and continues to increase [9,10,11].

While initial treatment options for breast cancer include surgery, with or without neo-adjuvant chemotherapy, adjuvant chemotherapy, radiation therapy, hormone therapy, and targeted therapy, these approaches are increasingly tailored to the specific tumor pathology of each patient. However, breast cancer survivors often experience a range of complex and multiple side effects. The given text consists of two sets of numbers: [12, 13] and [14]. Commonly documented adverse effects include cardiac toxicity [15], reproductive dysfunction, lymphedema [16], nausea [17, 18], vomiting [17, 18], pain [17, 19], sleeplessness [17], appetite loss [17], cognitive abnormalities [20, 21], and exhaustion [17, 18, 19, 22, 23]. The prevalence of tiredness as a side effect is high, with 70-100% of patients experiencing long-term exhaustion according to many studies [3, 17, 18, 22, 24, 25, 26].

Cancer-related tiredness often triggers a self-perpetuating cycle of decreased physical activity due to exhaustion, which further intensifies the sensation of weariness. Studies have shown that decreases in physical activity may lead to a loss in muscle mass and muscular strength, which in turn can cause a decline in the ability to perform activities of daily living (ADL) and an increase in sensations of weariness [27]. Diminished levels of physical activity, when combined with feelings of weariness, adversely affect other side effects such as health-related quality of life (QoL) [12, 17, 19, 22, 23, 25, 27, 28]. Accumulating data indicates that engaging in regular physical exercise improves activities of daily living (ADL) and quality of life (QoL) in individuals diagnosed with breast cancer [3, 29].

Physical exercise has been shown to effectively enhance activities of daily living (ADL) and decrease symptoms of weariness [30]. Moreover, there is abundant data indicating that engaging in physical exercise has positive impacts on mortality [18, 19], perceived weariness [31, 32], activities of daily living (ADL) [27, 33, 34], quality of life (QoL) [31, 34, 35], as well as anxiety and depression levels [35, 36]. Although there is increasing scientific data supporting the positive impacts of physical exercise, a significant number of breast cancer patients are hesitant to include physical exercise into their daily routine [18].

A systematic review conducted by Furmaniak et al. in the Cochrane database has provided compelling evidence of the beneficial benefits of fitness training in breast cancer patients undergoing adjuvant treatment [37]. Regrettably, there has been no differentiation established between various exercise programs in terms of the kind of training (such as strength training, endurance training, or mixed protocols) as well as the type of adjuvant treatment (chemotherapy, radiation therapy, or both). The objective of this systematic review is to evaluate the existing evidence on the impact of physical exercise programs on physical performance, fatigue levels,

and quality of life in breast cancer patients during the initial treatment phase. This assessment will consider different training protocols (endurance, resistance, or combined) and the type of adjuvant therapy (chemotherapy, radiation therapy, or both).

2. Physical Therapy

Given that physical training has become a fundamental aspect of breast cancer rehabilitation, the aforementioned results highlight the significance of the present systematic study. A systematic study conducted by Furmaniak et al. [37] determined that exercise had positive effects on enhancing physical fitness, quality of life, and reducing perceived weariness. The forest plots demonstrate that various interventions (such as CV endurance, resistance training, or a mix of both) during different forms of adjuvant treatment were collectively studied. The analysis concluded that exercise is more beneficial than conventional care. The present systematic evaluation validates the findings of Furmaniak et al. by clearly illustrating that different forms of intervention do not provide equally significant outcomes across various adjuvant regimens.

Physical performance refers to the ability of an individual to carry out physical activities and tasks efficiently and effectively. Physical performance in this review is defined as the evaluation of an individual's physiological fitness or exercise capability. From that standpoint, VO2peak and the 6 and 12 MWT were the most frequently used measures in the literature that was examined. Assessing physical performance often included the use of grip strength and strength tests of major muscle groups. Research using a supervised training program demonstrated superior benefits in physical performance compared to home-based methods. This is particularly true for investigations conducted during CT and RT, as shown by references [18, 19, 32, 36, 38]. While lacking empirical support, most investigations on cognitive therapy (CT) have used home-based methods and have produced inconsistent findings. Specifically, some studies have shown no disparities between the intervention and control groups [25, 39], while others have seen considerable enhancements in the intervention group [40]. Only one trial, which used a supervised methodology, demonstrated a significant improvement in VO2peak for the intervention group [31].

Regarding RT, there were just four studies available. The research [41] demonstrated a significant improvement in physical performance for the intervention group compared to the control group, based on a rigorous methodology. A research [42] with a lower methodological quality found no discernible disparities in physical performance between the intervention and control group. Two studies [43] implemented a supervised program and showed a substantial enhancement in favor of the intervention compared to the control group [44] during the supervised program.

3. Fatigue

The perception of weariness is very subjective and difficult to evaluate. Two studies examining physical activity treatments during resistance training (RT) shown an enhancement in

felt tiredness [24, 42]. Notably, both trials, whether conducted under supervision or at home, included strength training as the intervention method. Comparable findings were seen for treatments in patients undergoing a combined regimen of radiation therapy (RT) and chemotherapy (CT). Two trials that included strength workouts in a well monitored program saw a significant enhancement in reported tiredness compared to the control group [36, 38]. Curiously, the only trial that included strength exercises in a program conducted at home did not reveal any disparities between the group that received the intervention and the group that did not.

During the CT (cognitive training), only one research [45] shown enhancements in the felt sensations of weariness for the group receiving the intervention. Gokal et al. used a self-directed, vigorous walking program without including any strength training in their intervention [45]. No significant changes were seen between the intervention and control group in the other investigations [23, 25, 34, 40]. In summary, it can be inferred that included resistance workouts in both supervised and home-based programs effectively decreased the felt weariness.

4. Quality of Life (QoL)

A single research examined the impact of QoL in a cohort of patients who only received radiation therapy (RT). The study found that the group of patients who participated in a supervised cardiovascular endurance and resistance workouts program saw a substantial improvement in their QoL [24]. None of the studies examining the quality of life (QoL) in patients undergoing chemotherapy (CT) were able to show any benefits for the selected therapies [23, 35]. Notably, three out of five studies conducted on patients who received both CT and RT saw a substantial improvement in the quality of life (QoL) scores across the intervention groups [19, 33, 38]. The lack of a clear explanation for these variations might be attributed to the significant diversity in the chosen quality of life (QoL) questionnaires, which hinders the comparison of research. Furthermore, the selection of questionnaires can significantly impact the ultimate outcome. Travier et al. used both the EORTC-QLQ-C30 and SF-36 questionnaires, which are disease-specific and general, respectively. They found noteworthy enhancements in the intervention group using the SF-36 questionnaire, but no significant improvements were seen using the EORTC-QLQ-C30 questionnaire [38].

Breast cancer is a multifaceted illness, and an increasing number of patients are now being provided with a personalized treatment plan that is specifically designed for them based on the features of their tumor, as classified by TNM classification. Given the variation in treatment procedures leading to distinct side effects [17,18,19, 22, 23], it is logical to infer that the use of diverse outcome measures and a wide range of daily activities makes it challenging to compare the findings across the chosen studies

5. Conclusion

Based on the variety among the selected studies, we may infer that care should be used when formulating conclusions about the kind of physical rehabilitation programs and the chosen

method of supervision. Currently, there is inconclusive information about the extent to which various training programs improve the quality of life. This requires further consideration since Quality of Life (QoL) is often used as a key metric in cancer research. In summary, it may be inferred that exercise programs implemented during the early therapy phase show promising outcomes, while there is a need for rigorous and well-designed trials.

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