



E-ISSN: 2709-9385

P-ISSN: 2709-9377

JCRFS 2024; 5(1): 41-43

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www.foodresearchjournal.com

Received: 02-01-2024

Accepted: 07-02-2024

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Application of therapeutic diet for controlling breast cancer: A systematic review

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Abstract

A lot of research has been done on the possible preventive advantages of the Mediterranean diet, which is marked by a high intake of fruits, vegetables, whole grains, olive oil, and fish, especially breast cancer. The purpose of this systematic review is to examine the body of research on the use of therapeutic diets in the treatment of breast cancer. Overall health is greatly influenced by nutrition, which has also been linked to cancer prevention in a number of ways. It is well recognised that obesity increases the risk of breast cancer, especially in postmenopausal women. Dietary practices should support a comprehensive approach to breast cancer care by being in line with each patient's unique health objectives and medical conditions.

Keywords: Breast cancer, obesity, nutrients, human health, therapeutic diet, olive oil

1. Introduction

Breast cancer is a prevalent and life-threatening disease affecting millions of women worldwide (Cardoso *et al.*, 2018) ^[4]. While conventional treatments such as surgery, chemotherapy, and radiation therapy remain crucial, recent research has shed light on the potential impact of therapeutic diets in controlling and preventing breast cancer. A patient receiving a therapeutic diet is one who is afflicted with any kind of illness (Tewari, 2019) ^[13]. This systematic review aims to explore the existing literature on the application of therapeutic diets in the management of breast cancer (Duncan, 2004) ^[6].

1.1 Role of Nutrition in Breast Cancer Prevention

Nutrition plays a pivotal role in maintaining overall health and may significantly influence the risk of developing breast cancer (Rock & Demark-Wahnefried, 2002) ^[11]. Studies suggest that diets rich in fruits, vegetables, whole grains, and lean proteins can contribute to a reduced risk of breast cancer. Antioxidants found in these foods may help neutralize free radicals, which are implicated in the development of cancer (Pham-Huy *et al.*, 2008) ^[10]. Nutrition plays a crucial role in overall health, and it has been implicated in various aspects of cancer prevention, including breast cancer. While no single food or nutrient can guarantee the prevention of breast cancer, adopting a healthy and balanced diet can contribute to reducing the risk. Here are some key factors related to the role of nutrition in breast cancer prevention (De Cicco *et al.*, 2019) ^[5].

- 1. Maintaining a Healthy Weight:** Obesity is a known risk factor for breast cancer, especially in postmenopausal women. Consuming a balanced diet and engaging in regular physical activity can help maintain a healthy weight (Mohanty & Mohanty, 2021) ^[9].
- 2. Balanced Diet:** A diet rich in fruits, vegetables, whole grains, and lean proteins provides essential nutrients and antioxidants that support overall health. Antioxidants can help neutralize free radicals, which are molecules that can damage cells and contribute to cancer development.
- 3. Limiting Red and Processed Meat:** Some studies suggest a link between high consumption of red and processed meats and an increased risk of breast cancer. It's advisable to limit the intake of these foods and choose lean protein sources, such as poultry, fish, beans, and nuts.
- 4. Omega-3 Fatty Acids:** Omega-3 fatty acids, found in fatty fish (e.g., salmon, mackerel), flaxseeds, and walnuts, may have protective effects against breast cancer. They are known for their anti-inflammatory properties.

5. **Calcium and Vitamin D:** Adequate calcium and vitamin D intake is essential for bone health and may have a protective effect against breast cancer. These nutrients can be obtained from dairy products, fortified foods, and supplements if necessary.
6. **Limiting Alcohol Consumption:** Alcohol consumption is associated with an increased risk of breast cancer. Women are advised to limit alcohol intake or avoid it altogether to reduce their risk.
7. **Phytochemicals:** Plant-based compounds, such as phytoestrogens (found in soy products), flavonoids (found in fruits and vegetables), and polyphenols, may have protective effects. They can act as anti-cancer agents and contribute to overall health (Heber, 2004) [8].
8. **Fiber:** High-fiber diets, obtained from whole grains, fruits, and vegetables, may help reduce the risk of breast cancer. Fiber supports digestive health and can contribute to weight management.
9. **Avoiding Tobacco:** Smoking is associated with an increased risk of various cancers, including breast cancer. Quitting smoking is an essential step in cancer prevention (Britt *et al.*, 2020) [2].

It's important to note that while a healthy diet is a key component of breast cancer prevention, other lifestyle factors, such as regular physical activity, maintaining a healthy weight, and avoiding excessive alcohol consumption, also play crucial roles. Additionally, individuals should consult with healthcare professionals for personalized advice based on their individual health status and risk factors.

2. Mediterranean Diet and Breast Cancer

The Mediterranean diet, characterized by high consumption of fruits, vegetables, whole grains, olive oil, and fish, has been widely studied for its potential protective effects against various cancers, including breast cancer. The diet's anti-inflammatory and antioxidant properties may help modulate pathways involved in cancer development (Turati *et al.*, 2018) [14].

3. Plant-Based Diets and Breast Cancer

Plant-based diets, emphasizing the consumption of fruits, vegetables, legumes, and nuts, have gained attention for their potential in preventing and managing breast cancer. These diets are often rich in phytochemicals, fiber, and other bioactive compounds that may have anti-cancer properties (Anyene *et al.*, 2021) [1].

4. Ketogenic Diet and Breast Cancer

The ketogenic diet, which involves a low-carbohydrate and high-fat intake, has been studied for its potential in controlling cancer growth. Some research suggests that the ketogenic diet may affect cancer cells' metabolism and energy production, leading to decreased tumor growth. However, more studies are needed to fully understand its implications for breast cancer treatment (Urzi *et al.*, 2023) [15].

5. Impact of Obesity and Weight Management

Obesity is a known risk factor for breast cancer, particularly in postmenopausal women. Therapeutic diets aimed at weight management and reduction may contribute to lowering the risk of breast cancer and improving outcomes

for those already diagnosed. Caloric restriction and maintaining a healthy weight are integral components of such dietary interventions (Haslam, 2016) [7].

6. Phytoestrogens and Hormonal Balance

Phytoestrogens, plant-derived compounds with estrogen-like properties, have been investigated for their potential role in hormonal balance and breast cancer prevention. Diets rich in phytoestrogens, found in foods like soy, flaxseeds, and legumes, may have a protective effect by modulating estrogen levels (Sirotkin & Harrath, 2014) [12].

7. Limitations and Future Directions

While promising, the existing literature on therapeutic diets for breast cancer is not without limitations. Studies often vary in design, sample size, and duration, making it challenging to draw definitive conclusions. Additionally, individual responses to specific diets may differ, necessitating personalized approaches (Brutus *et al.*, 2013) [3].

8. Conclusion

This systematic review highlights the potential of therapeutic diets in the prevention and management of breast cancer. While more research is needed to establish concrete recommendations, adopting a balanced and nutritious diet may complement traditional treatment approaches. Patients and healthcare providers should collaborate to develop personalized dietary strategies that align with individual health goals and medical conditions, fostering a holistic approach to breast cancer care.

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