

## ORIGINAL

# Evaluation of dietary habits and nutritional needs in women treated for breast cancer in the Balearic Islands

*Evaluación de los hábitos dietéticos y las necesidades nutricionales en mujeres tratadas por cáncer de mama en las Islas Baleares*

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## Abstract

Breast cancer is the most common cancer in women, with more than 700 cases diagnosed each year in the Balearic Islands. There is extensive evidence that lifestyle factors, such as diet and physical activity, may be associated with the onset of tumour-associated malnutrition, but also with prognosis, mortality and relapse. At the same time, evidence suggests that nutrition strategies are often insufficient or non-existent due to lack of resources or infrastructure. The aim of this protocol is to analyse lifestyle factors, such as dietary habits, physical activity and quality of life, in women treated for breast cancer in the Balearic Islands, as well as to evaluate their need of nutritional support. The project proposed consists of a descriptive cross-sectional study in women treated for breast cancer with chemotherapy. The recruitment procedure will be performed in public and private hospitals (n=200) and will comply with current ethical standards and regulations. The strength of this proposal is to establish an objective perspective of the current state of nutritional care for breast cancer patients in the Balearic healthcare system, enabling improved future interventions in women treated for breast cancer but also in other oncologic patients.

**Keywords:** Breast cancer, Nutrition, Quality of Life, Physical Activity, Clinical practice.

## Resumen

El cáncer de mama es el cáncer más común entre las mujeres, con más de 700 casos diagnosticados cada año en Baleares. Existe amplia evidencia de que los factores del estilo de vida, como la dieta y la actividad física, pueden estar asociados con la aparición de desnutrición asociada al cáncer, pero también con el pronóstico, la mortalidad y la recaída. Al mismo tiempo, la evidencia sugiere que las estrategias de nutrición a menudo son insuficientes o inexistentes debido a la falta de recursos o infraestructura. El presente protocolo tiene como objetivo analizar los factores relacionados con el estilo de vida, como los hábitos alimentarios, la actividad física y la calidad de vida, en mujeres tratadas por cáncer de mama en Baleares, así como evaluar su necesidad de apoyo nutricional. El proyecto propuesto consiste en un estudio descriptivo transversal en mujeres tratadas por cáncer de mama con quimioterapia. El procedimiento de reclutamiento se realizará en hospitales públicos y privados (n=200) y cumplirá con las normas y estándares éticos vigentes. La fuerza de esta propuesta es establecer una perspectiva objetiva del estado actual de la nutrición en el sistema sanitario balear, que permita futuras intervenciones en mujeres tratadas por cáncer de mama, pero también en otros pacientes oncológicos.

**Palabras clave:** Cáncer de mama, Nutrición, Calidad de vida, Actividad física, Práctica clínica.

## Background

Cancer is one of the most common causes of death worldwide, according to the World Health Organization, accounting for one in six deaths. In fact, in 2040, the number of new cancer diagnoses is estimated to reach 30.2 million with 16.3 million deaths<sup>1</sup>. Among all cancers, breast cancer is the most common cancer in women<sup>2</sup>.

When cancer is diagnosed and treatment starts, many distressing events are usually reported, both physical and psychological<sup>3</sup>. Physical symptoms are classified according whether they are hematological alterations, such as anemia or lymphopenia, and non-hematological, including anorexia, myalgia or gastrointestinal disorders<sup>4</sup>. Most importantly, any of these symptoms will promote malnutrition and decrease physical function, which will ultimately have a deteriorating impact on quality of life.

Women with obesity and breast cancer also present worse quality of life compared to their non-obese counterparts<sup>5</sup>. Furthermore, it has also been observed that not only malnutrition, but also the fat gain associated to breast cancer, are critical prognostic factors for mortality and recurrence<sup>6,7</sup>.

There is extensive evidence that lifestyle factors, such as diet and physical activity, may be associated with the onset of malnutrition in its different forms<sup>8,9</sup>. Therefore, interventions which monitor adherence to dietary recommendations and promote an increase in physical activity can have a positive impact on quality of life but also on the prognosis and mortality associated to the tumour and recurrence rates<sup>10-12</sup>.

At the same time, it is very well established that in the health systems of many countries nutritional strategies following and/or in conjunction with chemotherapy are often insufficient or non-existent, due to a lack of resources or infrastructure<sup>13-16</sup>. Furthermore, studies reflecting the current status of this service in Spain are scarce and thus it can be assumed that there is a blind spot in the clinical practices surrounding this situation.

In addition, there is little knowledge regarding the dietary habits of women with cancer in the Balearic Islands and therefore it is unknown whether a nutritional support intervention would have an impact on their food habits and medic development. Nevertheless, studies in women with breast cancer conducted in other populations have shown that patients usually modify their regular diet during the course of chemotherapy treatment<sup>17,18</sup>.

Thus, the main objective of this study is to perform a nutritional assessment in women diagnosed and treated for breast cancer in the Balearic Islands and explore their need for nutritional support throughout the chemotherapy process.

## Methodology

### Study design and participants

The project proposed is an observational study, with a descriptive cross-sectional design. Study participants are women treated for breast cancer at the time of chemotherapy treatment. Sample size was calculated in order for it to be representative of the Balearic Islands. Every year, more than 700 women are diagnosed with breast cancer in the Balearic Islands<sup>16</sup>. Of these women, nearly 400 have an age range between 45 and 65 years old. Therefore, a representative sample was considered to be 50% of this major population, resulting in a sample size of approximately 200 participants. The recruitment procedure will be done in public and private hospitals during the period of 2 years. The type of sampling performed will be opportunistic, whereby all subjects will have the same probability of becoming part of the study and will be offered to participate.

**Table 1:** Eligibility criteria.

Inclusion criteria	Exclusion criteria
Sign the informed consent	Terminal clinical situation
Female sex	Psychiatric condition
An established tumour histochemical subtype	Previous disease that could have affected nutritional status
Age range $\geq 18$ and $\leq 80$	Receive exclusive feeding via parenteral nutrition

A pilot study will be performed, where comprehension of the newly developed survey will be conducted, and whether all questions are answered. Changes to improve the survey will be applied if necessary. Ethical approval for this research project was obtained from the Ethical Committee of Research from the University of Balearic Islands (**228CER21**). The study will be carried out in accordance with the principles of the Declaration of Helsinki and the International Conference for Harmonization.

### Questionnaire

In order to carry out this nutritional assessment, a new comprehensive survey will be developed based on previously validated and published questionnaires which consider various dimensions (diet, sleep patterns, physical activity, quality of life, sociodemographic factors). The questionnaires used will be: *questionnaire MEDAS of Adherence to the Mediterranean Diet*<sup>19</sup>, *Mini Nutritional Assessment*<sup>20</sup>, *Subjective global assessment generated by the patient (VGS)*<sup>21</sup>, *World Health Organization Quality of Life Questionnaire (WHOQOL-Bref)*<sup>22</sup>, *Patient Health Quality (PHQ9)*<sup>23</sup> the *MOS-Sleep*<sup>24</sup> and the *International Questionnaire of Physical Activity (IPAQ)*<sup>25</sup>, resulting in around 80 questions with an expected time of completion of 30 minutes. Furthermore, 9 questions regarding adherence to the *World Cancer Research Fund and the American Institute for Cancer Research*, dietary and lifestyle recommendations were also included. Thus, the intention of this survey is to capture

the following information: 1. Quality of the diet; 2. Current nutritional status; 3. Lifestyle behaviours (eating times, sleep); 4. Physical activity levels; 5. Perceived quality of life; 6. Influence of sociodemographic factors; 7. Extent to which patients have received nutritional counselling as well as the quality of counselling. This survey will be implemented by trained nutritionists.

### Statistical Analysis

Statistical analysis will be performed using Stata (StataCorp. 2019. Stata Statistical Software). Firstly, an extensive descriptive analysis will be carried out, including: labelling and purification of the data. Also, normality tests and scatters plots will be done for all variables of interest. In the case that high deviations are found, other measures of central tendency will be used, such as medians or modes. Secondly, a bivariate analysis will be carried. Outcomes will be compared with published data, nutritional recommendations and with quality diet indexes in literature.

## Discussion

The main limitation of this study relates to the cross-sectional nature of our analyses and the potential for reverse causality bias, and thus it will not be possible to assess the dietary changes that typically occur during chemotherapy and that are reflected in the scientific literature. Furthermore, is it highly plausible that subjects who perceive themselves at risk or as overweight/obese will be more likely to adopt favorable changes in their diets. Lastly, answers may be biased by memory and expectations of which is the best possible or “healthier” answer (also known as Social desirability bias) and to try to sort this limitation, well trained nutritionist interviewers will be part of the project and different dimensions will be inquired by various questions.

The advancement in modern medicine has meant earlier diagnosis of cancer and an increase in the amount of available medications, radiation and surgical interventions. Thus, the number of cancer survivors has increased, and therefore the goal of cancer management is no longer just to treat the disease but also to reduce the risk of further morbidity and mortality. By ensuring survivors develop healthy lifestyle habits, it will be promoted the best possible quality of life in relation to health.

The results of this research will allow the understanding of the current practices and knowledge related to nutrition and oncology in multidisciplinary cooperation and, consequently, enable nutritional interventions in the future. It is expected that this study can provide a general overview in order to develop more studies or nutritional interventions from the start of chemotherapy in future years.

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