**Artículo Original**

# Eating behavior among cancer patients: a cross-sectional study

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## ABSTRACT

**Introduction:** Malnutrition is a high risk health complication that occurred with cancer, the deterioration of the nutritional status in cancer patients increases morbidity and mortality, decreases the efficacy and tolerance of oncology treatments and the quality of life. It was thus considered important to evaluate the prevalence of malnutrition, to assess the nutritional knowledge and eating habits among cancer patients.

**Methods:** observational descriptive study based on a questionnaire, conducted in the unit of oncology at University Hospital Center of Casablanca, Morocco, Malnutrition was defined as a body mass index (BMI) <18.5 in patients ≥18 years old.

**Results:** A total of 216 questionnaires were analyzed. The extremes of age ranged between 28 and 79 years with an average age of 44 years. The objective evaluation of the nutritional status showed that 48% of the patients were malnourished. Our population of patients had poor knowledge of the nutritional problems caused by cancer with rate of 78%, and 88% did not benefit from nutritional monitoring by a dietitian. The most common causes of the decline in food intake were loss of appetite (84.5%), taste loss (45.7%), (26%) nausea and swallowing disorders, loss of smell (19.2%), vomiting (18.6%), abdominal pain (15%).

**Conclusion:** The prevalence of malnutrition is high in patients with cancer, and the nutritional care seems still insufficient. An improvement in the information tools on nutrition available to patients is required.

## INTRODUCTION

Cancer is one of the leading causes of death in the world. There were an estimated 18.1 million new cases of cancer and 9.6 million deaths from cancer worldwide in 2018[1].

According to new figures released by the WHO, 52783 new cases of cancer have been reported in Morocco in 2018[2]. It is considered a disease with a particular nutritional situation. Normal nutritional status is one of the key elements in the ability to overcome the disease. Metabolic and immune functions and body composition are maintained in adults through a Between 30% to 80% of cancer patients lose weight, early nutritional intervention can improve prognosis, increase quality of life, and decrease complications. The location and extent of the tumor are directly involved in the appearance of nutritional deterioration[3].

Recognition, prevention and management of malnutrition therefore play an important role in therapeutic strategies. The patient's information and knowledge of his illness, his treatment and his alimentation allow him to participate in his own care, to manage his undesirable effects and to prevent this malnutrition.

Improving the nutritional care of oncologic patient is a public health imperative. The deterioration of nutritional status in cancer patients increases morbidity and mortality, decreases the efficacy and tolerance of oncology treatments and the quality of life[4]. The education of the patient on the nutritional risks of the disease and treatments is therefore essential from

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the diagnosis and must be repeated, and adapted throughout the care[5].

The objective of this study is to evaluate the prevalence of malnutrition, to establish an inventory and assess the nutritional knowledge and eating habits among cancer patients.

## METHODS

This is an observational descriptive study based on an anonymous questionnaire completed by questioning patients. The survey has been conducted in the Oncology Department at University Hospital Center IBN Rochd of Casablanca, Morocco, between December 2018 and May 2019 by one interviewer.

Patients who are undergoing diagnosis and/or who have not yet received any treatment and/or refused to answer the questionnaire and /or are at the palliative stage and who are considered too tired to participate in the study, have been excluded from this investigation. Patients in hospital, day hospital or consultation have been interviewed to complete the questionnaire.

The tool used for this investigation is a multidimensional exploitation sheet, which is divided into two parts:

- The first part allowed the collection of socio-demographic data (patient's birth date and gender, educational level, marital status) and clinical data (nutritional status, site of primary tumor, presence of distant metastasis, treatment received during the stay or in relation to current hospitalization (surgery, radiotherapy, chemotherapy))

The nutritional status of the patients was objectively assessed by the body mass index method; the *body mass index* was calculated for each patient according to the formula below[6]:

$$BMI = [actual\ weight\ at\ follow\text{-}up\ (kg)] / [height^2\ (m)]$$

Malnutrition was defined as BMI <18.5 in patients ≥18 years old[6].

Size measuring instrument was portable height rod. Portable electronic health weight scale was used to measure patient's weight.

- The second part includes items concerning the lifestyle (physical exercise, smoker or not), patient nutritional information (nutritional problems caused by cancer, tips on diet, followed or not by a nutritionist), information need regarding diet, receive nutritional support such as oral nutritional supplementation as well as enteral/parenteral nutrition and eating habits.

The questionnaire filling has been done by a direct interview with patients during chemotherapy administration, or during hospitalization.

Patients were considered eligible if they were aged ≥18 years, willing and able to give their usual weight, current weight, and current height could be measured.

All included patients have formulated their informed consent.

For descriptive analyze, qualitative data were summarized as frequencies. Results were expressed as means and standard deviation. The data entry was done on Excel and the statistical study was carried out using SPSS software [version 22].

## RESULTS

Two hundred thirty patients meeting the criteria of the study were interviewed. The response rate is 94%, 14 patients were excluded because they were tired and unable to respond. A total of 216 questionnaires were analyzed. The population of patients who responded to the questionnaire was representative in terms of age, sex, cancer location, and nutritional status.

The extremes of age ranged between 28 and 79 years with an average age of 44 years, Women accounted for 72% of the population, compared with a sex ratio M/F of 0.38. Regarding the level of education, 59% of the population was illiterate, the remaining 41% of patients were divided between primary schooling (19.4%), secondary schooling (18.6%), and only 3% of patients had higher levels of education. Concerning patients' family situation, 67% were married, 23% were single, 8.42% were widowed and 1.58% were divorced.Table 1 shows patients' socio-demographic characteristics.

Breast cancer accounts for almost half of women's cancers (47%), followed by cervical cancer (26%), Colon (12%), lung (11.5%), ovary (3.5%). The main types of cancer in men are: Ear Nose and Throat ENT (40%), lung (19%), colon (13%), bladder (9%) and prostate (6%).

In 65.5% of cases, patients with cancer were on chemotherapy alone, (11.2%) on hormone therapy, (10.8%) on radiotherapy associated with chemotherapy, (9.1%) on surgery, (1.9%) on radiotherapy alone, and (1.5%) in palliative care.The percentage of patients who continued smoking during cancer treatment was 2.9%, alcohol consumption was observed in 2% of cases.

This survey showed that 21% of respondents practiced physical activity during their illness, compared to 10% who stopped it after diagnosis and 69% who never did it. The most cited physical activity was walking (71%).The cessation of physical activity after diagnosis was due to fatigue, particularly related to chemotherapy (53%), followed by lack of courage (37%) and pain (10%).

**Table 1.** Patients'socio-demographic characteristics.

| | Variables | Percent (%) |
|---|---|---|
| **Age (years)** | Average =**44** | Standard deviation= ±**25.5** |
| **Gender** | Female | 72% |
| | Male | 28% |
| **Level of education** | Illiterate | 59% |
| | Primary schooling | 19.4% |
| | Secondary schooling | 18.6% |
| | higher levels of education | 3% |
| **Family situation** | Married | 67% |
| | Single | 23% |
| | Widowed | 8.42% |
| | Divorced | 1.58% |

Regarding advices about diet for cancer patients, Health-specific diet counseling was provided to 41% of cancer patients surveyed. A large proportion of patients (59%) reported that they did not receive this advice and that no prior information on their diets was provided.

Our study reveals that 88% of interviewed patients did not benefit from nutritional monitoring by a dietitian. Of these, 14.5% were seen by a nutritionist and this under the request of the attending physician at least once during their care journey

Regarding patient information on nutritional problems caused by cancer, the first question in the questionnaire revealed that patients had poor knowledge on nutritional problems caused by the disease with a high rate of 78%. The main source of information was the attending physician for 45%, the others patients in 23%, the other sources of information (internet, media, radio ...) for 10%, the entourage in 18% and finally the pharmacist in 4%. The main sources of information on nutritional problems caused by cancer are shown in Figure 1.

More than half of the patients (68%) followed a diet, of which 78% discarded meat, 70% dairy products, 23% eggs, 7% fish and 50% avoided other foods (deli meats, preserves, fries, sweets ...).The distribution of foods discarded by our patients is shown in Figure 2.

**Figure 1.** Sources of information on nutritional problems caused by cancer.
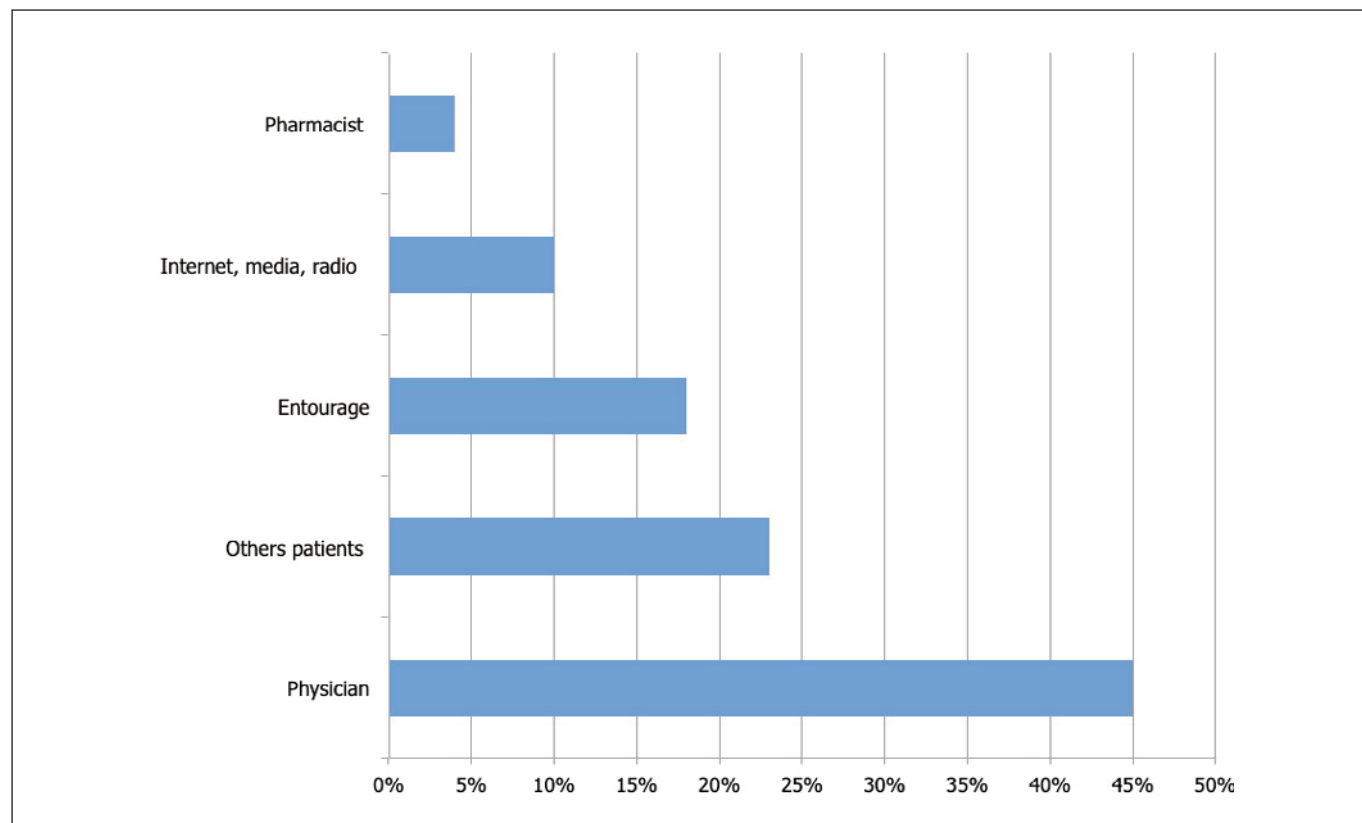
Several causes of the decrease in food intake were cited by our patients. The most common were loss of appetite (84.5%) and taste loss (45.7%), (26 %) nausea and poor swallowing, followed by loss of smell (19.2%) and vomiting (18.6%), abdominal pain (15%) and (18%) from other causes. The causes of the decline in food intake are shown in Figure 3.

About medicinal plants, 40% of patients used them simultaneously with their medicinal treatmentto treat their cancer.Among them, mostly were women (83%), of which 81% were illiterate.

Fifty nine species of medicinal plants belonging to 38 families have been identified.The most commonly used species were essentially *Marrubium vulgare L* followed by *Aristolochia longa*, *Berberis vulgaris*. *Euphobia resinifera*,*Trigonella foenum-graecum*, *Olea europaea,* and *Cucuma longa.*

We have noted that 80% of cancer patients do not disclose information about the use of Medicinal Plants to their referring physicians.

The use of medicinal plants was mainly advised by friends (74%), by self-medication (15%), from an herbalist / phytotherapist (9.1%) or from internet search (1.9%).

The objective evaluation of the nutritional status of patients showed that 48% of the patients were malnourished.

The remaining patients (52%) were found to be non-malnourished at the normal BMI beetwen18.5 and 24.9 Kg/m². The distribution of the nutritional status of patients is shown in Figure 4.

Sixty three point four percent of malnourished patients have not received nutrition support such as oral nutritional supplementation as well as enteral and/or parenteral nutrition, and 67% of global patients say they have lost weight since the beginning of their illness and 33% claimed to have lost weight during treatment.

## DISCUSSION

### Nutritional status and support

In our study, 48% of patients were malnourished or at risk of malnutrition. This finding confirmed the high prevalence of malnutrition in patients with neoplastic conditions**.** In a descriptive cross-sectional study[3], which was conducted in medical oncology service, Badajoz University Hospital, Spain, where cancer patients were included, 65% of the patients were malnourished. A survey was carried out in 154 French hospital wards in 2014, Nutrition status was collected for 1903 patients, 39% of patients were malnourished, and only 28.4% of non-malnourished patients and 57.6% of malnourished patients received nutrition support[7].

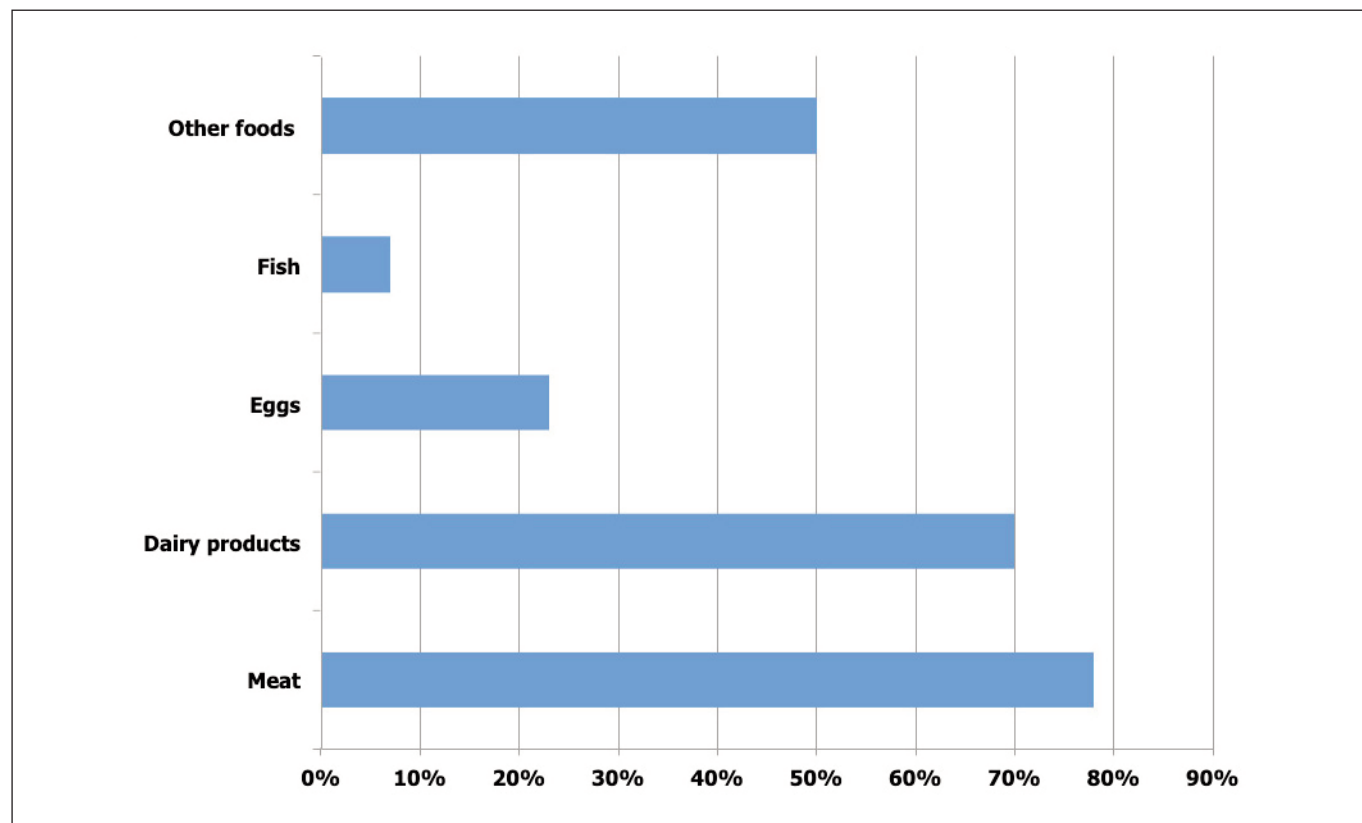**Figure 2.** The distribution of foods avoided by cancer patients.

**Figure 3.** Causes of decreased food intake cited by cancer patients.
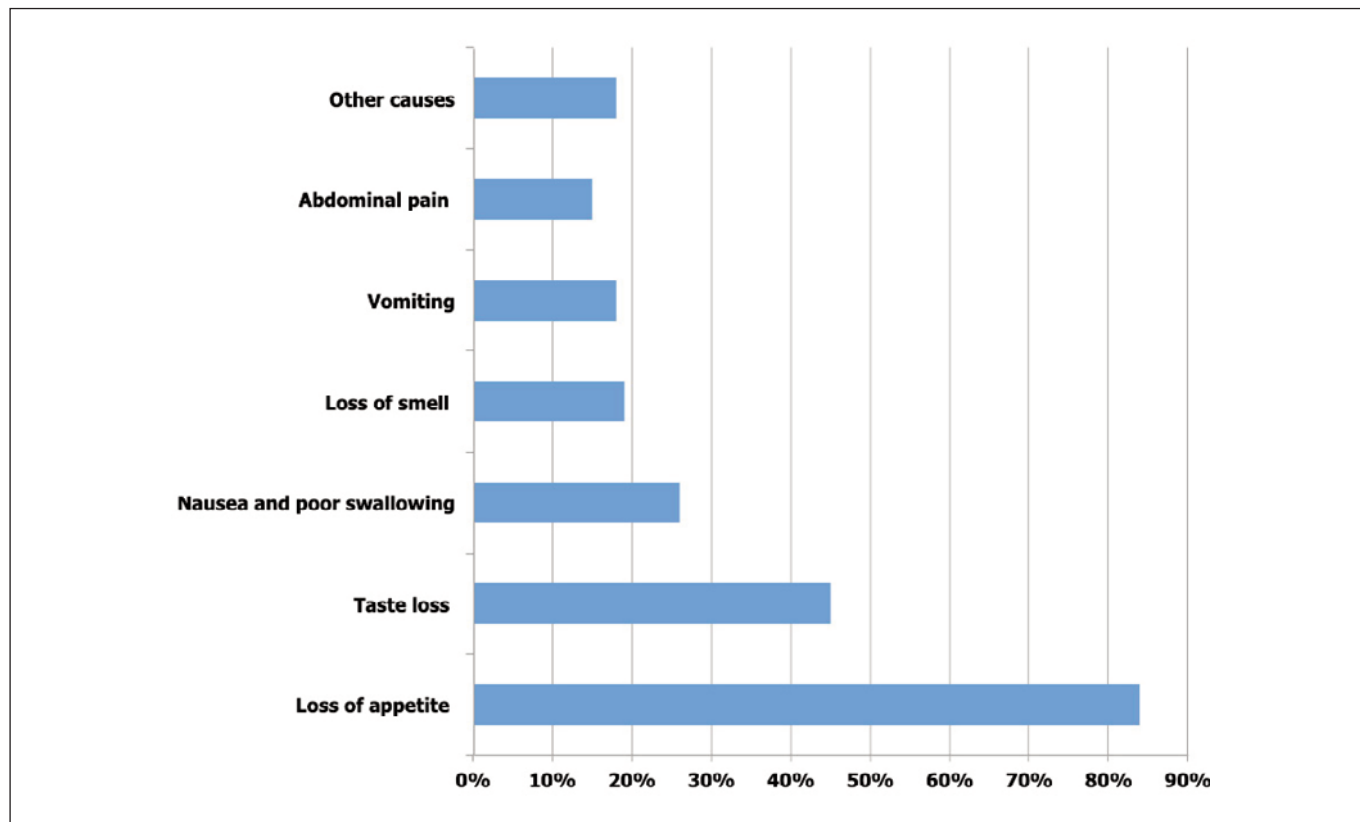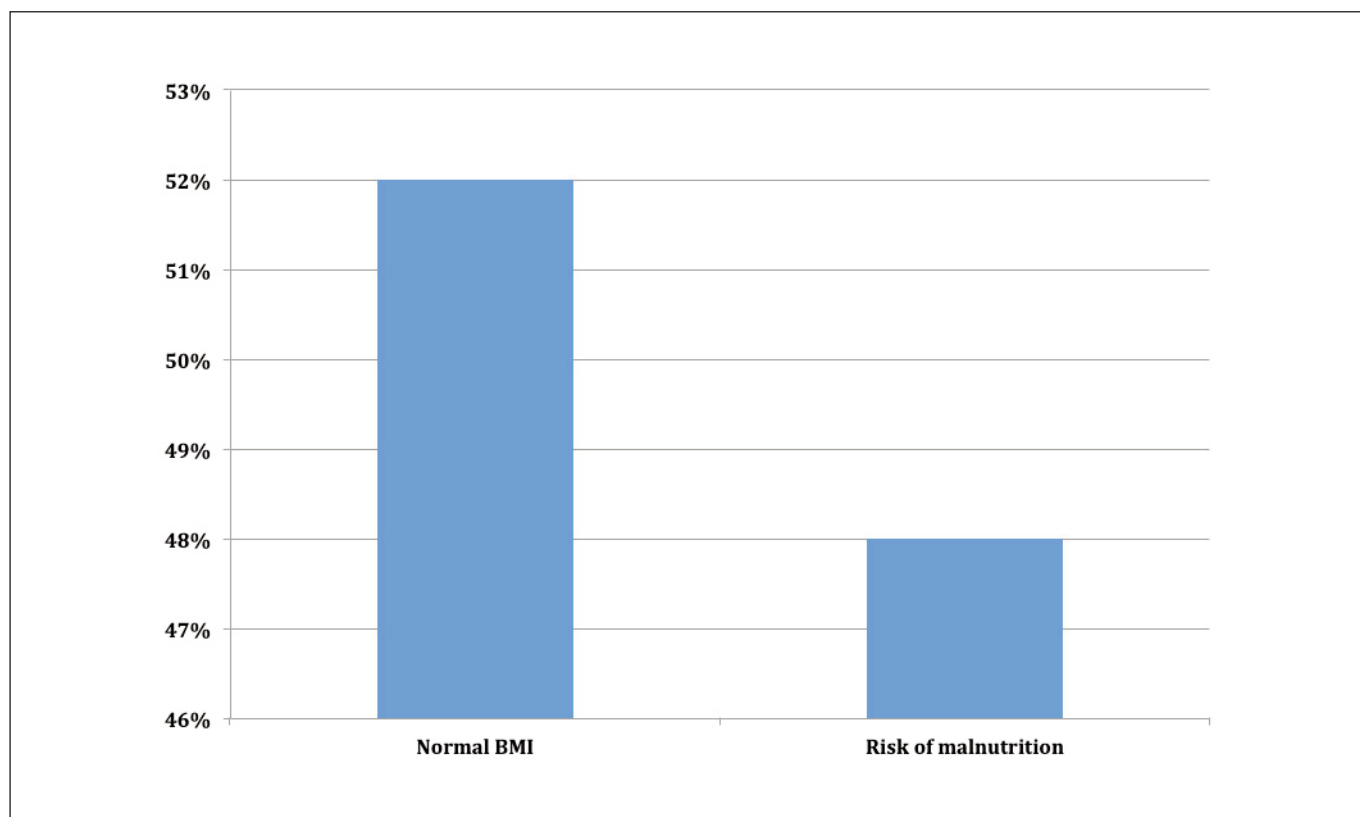


**Figure 4.** Distribution of the nutritional status of patients.

Despite the high prevalence of malnutrition and its deleterious effects, systematic screening and then nutritional management of cancer patients remain insufficient. A high rate of our malnourished patients has not received nutrition support such as oral nutritional supplementation as well as enteral and/or parenteral nutrition (63.4%). In the Nutricancer study, fewer than 50% of patients at risk of malnutrition received nutritional support[8].

### Causes of decreased food intake

Sixty percent of our patients considered that they were eating less than before the cancer.

Most chemotherapy causes an alteration of the oral and digestive mucosa. Side effects such as stomatitis, oesophagitis, nausea, dysgeusia (changes in taste) and diarrhea are of varying intensity. They reduce nutritional intake and / or absorption[9].

In a cross-sectional study which was carried out in Spain[10], xerostomia (85%), dysgeusia (80%), solid dysphagia (80%), others (mucositis, constipation, loss of appetite, nausea and vomiting, diarrhea), were the most prevalent symptoms which may interfere with the normal diet and nutrition of oncologic patients, with a possible impact on their quality of life.

The same reasons of decline in food intake cited by our patients were reported in a survey carried out in 154 hospital wards in 24 French cities[7]. In French hospitals, it was anorexia (62.5% against 84.5% in our series), loss of taste (42.2% against 45.7% in our series), nausea (29.9% against 26% in our series), vomiting (13.8% against 18.6% in our series), loss of smell (11.6% against 19.2% in our series), and abdominal pain (14.5% against 15% in our series).

Dietary advice can reduce anorexia nervosa, nausea, vomiting, dysgeusia and diarrhea and improve the quality of life of cancer patients. Moreover, the long-term follow-up of patients showed that dietary counseling was associated with lower disease-specific mortality[11].

### Sources of nutritional advice

Our oncologic patients declared that the main source of their nutritional information was the attending physician for 69%, the other sources of information (internet, media, radio) for 15%, the entourage in 9% and finally the pharmacist with a percentage of 7%.While12.9% of interviewed people in the Nutricancer study[8] said that they received nutritional advice by the attending physician, by hospital physicians (31.9%), by a nutritionist (10.4%), by a dietitian (56.3%) or by another person (10.2%).

Responses to patients' information needs improve the quality of life of patients, promote better adherence to treatments, and reduce their stress[12].

To address the lack of medical recommendations on dietary habits during therapeutic management, patients could try non-conventional medicine. In our study, the entourage is a direct source of information[13].

### Dietary habits

The data collected in our study shows that 68% of patients follow a diet and that some foods are spontaneously rejected by patients, such as meats including red meats, dairy products, salt, canned foods, cold cuts or fried foods. Patients' awareness of the effect of these foods on their health and also the adverse effects of treatments are the main causes of changes in their eating behavior[14]. We found that 70% of our patients discarded dairy products, and 23% discarded eggs. *Azadeh et al.* informed that participants with the greatest consumption of egg intake were 62% less likely to have glial tumor compared with those with the lowest consumption[15], that explains that the avoiding of egg consumption in our patients does not have any advantage.

Results have shown almost the half of patients declared having a decreased consumption of sugar and sweet products while 26% declared an increased consumption. When looking at psychological triggers to consumption, the weight of fatigue and worry increased after cancer diagnosis compared to before. Environmental triggers such as mixed messages from health professionals or media need to be further investigated[16].

This investigation shows that Moroccan cancer patients are in the process of using medicinal plants randomly**,** *Marrubium vulgare L, Aristolochia longa, Berberis vulgaris**,** Euphobia resinifera, Cucuma longa* were the most commonly used herbal remedies. Although, there are some herbs that are proven to be toxic such as *Euphorbia resinifera* and *Aristolochia longa*. Aristolochic acid is recognized to cause nephropathy associated with urinary tract cancer[17].

### Monitoring of the nutritional care plan

The monitoring of the nutritional care plan is a multidisciplinary task. It involves oncologists, radiation therapists, and nurses, as well as dietitians. With weekly or biweekly visits, the dietitian keeps a close watch on intake and weight fluctuations[13].

Of the patients surveyed in our study, more than half (59%) never received nutritional advice or information about their diets. In the French Nutricancer study, similar results were found that is 58.6%[7]. The patient should have access to consultations with the dietitian or nutritionist during medical care[13]. The application of individual nutritional consultation by experienced health professionals helps to prevent deterioration of nutritional status of patients, but the main problem of accessibility to this support care remains the non-systemic assignment of the dietitian or nutritionist in oncology services.

### The right to medical information

In the Moroccan context, poverty and illiteracy combined with the fact that some patients are berberophone, limit communication and make the transfer between patient and doctor difficult. Questions concerning the right to medical information deserve to be asked. The health professional is also required to consider the socio-economic level of the patient and to adapt his language accordingly. Indeed, in our Moroccan society, which is both modern and authentic, there are different patient profiles, with varying socio-economic and cultural levels, which obliges the practitioner to adapt his language permanently[12].

## CONCLUSION

This study demonstrated that the prevalence of malnutrition is still very high in patients with cancer, affecting as many as 1 of 2. Many cancer patients have significantly reduced oral food intake and have not received any dietary advice.

Our finding confirms that malnutrition is a major problem in patients with cancer. Compared to weight loss and food difficulties reported by patients, the nutritional care seems still insufficient. Anorexia and loss of taste, which are the main causes of reduced dietary intake, should prompt specific research.

Optimizing nutritional intervention in patients with cancer, from diagnosis to remission or recurrence is based on:

1. An improvement in the information tools on nutrition and cancer available to patients, their relatives and health professionals.

2. The creation and implementation of consensual best professional practices taking into account the constraints of care structures.

## ACKNOWLEDGMENTS

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