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## PURPOSE:

Cancer cachexia and treatment-induced side effects can contribute to deterioration in nutritional status in patients declining the quality of life and survival rates by 25%. Culinary practices may provide new strategies to minimize the symptoms. The objective of the NEODIA study (*learning to live with a cancer on a day-to-day basis*) was to understand the occurrence of treatment-related side effects as well as culinary habits and food choices in cancer patients and to develop a culinary practice and web-based educational program for the patients, families and health care staff.

## METHODS AND ANALYSIS:

The study population consists of 197 men and women eligible for cancer treatment after a diagnosis of colorectal cancer, breast cancer, non-Hodgkinien lymphoma, esophageal/gastric cancer, liver cancer and lung cancer. The patients were recruited during a 2-year period at the Beauvais city hospital, France. A validated 145-item questionnaire has been performed in out-patients inquiring about the frequency and occurrence of treatment-induced side effects, frequency and consumption of food and beverages as well as culinary habits. Out of the 197 patients, 10 patients were selected to create the patients expert panel according to eligible criteria (e.g. frequent cooking practices before the illness, currently experienced side effects since the implementation of treatments, capability to determine taste changes, capacity to propose solutions to alleviate problems). Data analysis was performed using SPHINX software.

## RESULTS:

The survey comprised 56% of women and 44% of men between the ages of 45 and 60. Men were mainly treated for colorectal or lung cancer, whereas women predominately for breast cancer.

The results of the survey showed that several types of side effects were commonly reported, independently from a given cancer type or treatment. After the two first treatment sessions patients often or regularly experienced fatigue (90%), nausea (63%), a change of taste of foods (73%), loss of appetite (49%), bad taste in the mouth (44%), dryness in the oral mucosa (41%) or constipation (40%). They also had the sensation to be filled quickly (51%). The results yielded into the development of different pictograms representing common side-effects. These pictograms were used to classify the recipes of the *Vite-fait-bienfaits.fr* website (Figure 2).

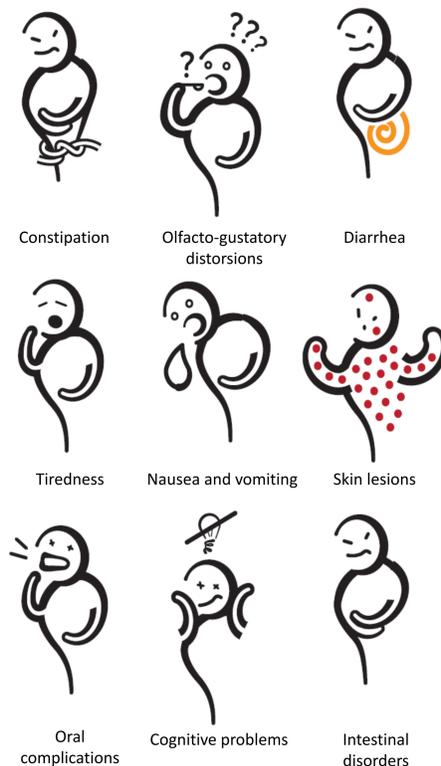


Figure 2: Selection of pictograms representing different side-effects that classify the recipes of the *Vite-fait-bienfaits.fr* website



Figure 3: Logo of the *Vite-fait-bienfaits.fr* website

The *Vite-fait-bienfaits.fr* website (Figure 3) is designed for patients, health professionals, as well as caregivers, and is publicly available until January 2015. There are about 100 recipes adapted for 9 keys side-effects identified in the NEODIA study survey, using 18 pre-defined herbs and spices and finally proposing 20 culinary advices. Over 3000 people consulted the website during the 1<sup>st</sup> year.

## CONCLUSION AND OUTLOOK:

The French 'Cancer Plan', launched in 2014, emphasizes the need to preserve the continuity and the quality of life by offering comprehensive support to the patient during and after the disease. The NEODIA study supports the feasibility of culinary education as new strategy to prevent and minimize treatment-induced side effects in cancer patients. The multiplication of such approaches may be useful to manage the continuity during the transition from hospital to homecare and *vice versa*.

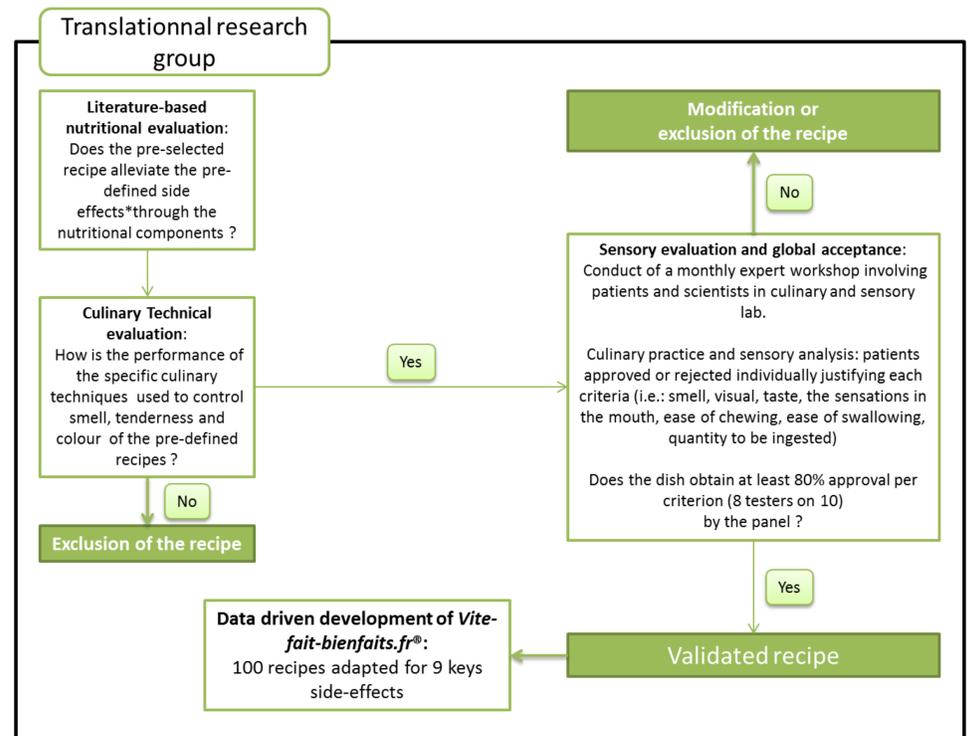


Figure 1: Step-wise development of the *Vite-fait-bienfaits.fr* website

## RESULTS

The translational research group to develop the culinary practice and web-based educational program was composed by 3 scientists and the patients expert panel (10 female patients, 42-62 years old) that met monthly during a time period of 24 months. Three steps relevant for the development of *Vite-fait-bienfaits.fr* website were identified: 1) *Literature-based nutritional evaluation*, 2) *Culinary technical evaluation* and 3) *Sensory evaluation and global acceptance* (Figure 1). The pre-selection of the recipes was performed according to previous knowledge, and took into account the reported consumption changes of specific food and ingredients (Table 1). The goal of the first step was to narratively evaluate if the nutritional components of a given recipe indicate a capability to alleviate side effects, for example peppermint use to reduce nausea and vomiting. For the second step, 12 culinary workshops were organized to evaluate the performance of the culinary techniques used. Finally, during the sensory analysis step, the patients expert panel evaluated the pre-selected recipes using standardized criteria (e.g. smell, quantities, temperature, taste).

Table 1:

Qualitative evaluation of changes of consumption of specific foods and ingredients during cancer treatments

Qualitative changes of consumption during cancer treatments	Food/Ingredients
High increase	Sweet Spices, Starches, Fruits, soft bread, soup and veg broth, fish, white meat, sugar, raw butter, creamy yoghurt, yoghurt drinks, sweet yoghurt, cottage or white cheese, soft cheese, tea or tisane, sparkling water, still water, fruit juice, water with syrup
Moderate increase	Aromatic herbs, crudeness, raw milk drinks, milk used for cooking
Neutral	Dried biscuits, egg, pastries, sauce dishes, ripened cheese, chocolate, soda
High decrease	Garlic, processed meats, spicy meal, frying, crusty bread, meat juice, red meat, salt, sorbets, ice-cream, fried butter, hard cheese, salted cheese, alcohol, coffee