

A survey of cancer patient preferences: which types of snacks do they prefer during treatment?

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Cancer patients undergoing treatment may find it difficult to maintain proper caloric intake. This survey sought to characterize food/beverage preferences and services related to nutritional needs for oncology outpatients. A total of 222 adult oncology patients completed surveys while in an oncology clinic for treatment or for a medical appointment. Data were collected on demographic characteristics, cancer diagnosis/treatment, general health behaviours, preferences for various foods and beverages that could feasibly be offered in the clinic setting and interest in nutrition-related services. Foods requested by at least 50% of the respondents included several types of crackers, doughnuts, fruit cups, cookies, applesauce and gelatin cups. Beverages requested by at least 50% of the respondents included filtered water, coffee, soft drinks and various juices. Nearly 50% requested caffeine-free beverages, and nearly 40% requested sugar-free food choices. Regarding nutrition-related services, respondents were most interested in recipes for persons with cancer, nutrition information/brochures and nutrition counselling. We found that assessing patients' nutritional preferences through survey methodology in the oncology clinic setting was feasible. It is important to aid patients' ability to consume food and beverages that they consider most palatable in order to maintain sufficient caloric intake during active treatment.

Keywords: cancer, nutrition.

INTRODUCTION

Nutritional patterns in patients with cancer in active treatment may be affected by three major factors: the extent or growth of disease, effects of chemotherapy and/or radiation therapy, and development of food aversions (Enig *et al.* 1987). Cancer-related surgery, radiation therapy and chemotherapy can change nutritional needs

and impair the intake, digestion, absorption and utilization of food (Brown *et al.* 2001). Other side effects of cancer treatment may include, but are not limited to, nausea, vomiting, diarrhoea, constipation, oral lesions, dry mouth, mucositis and alterations of the taste and smell of food. These symptoms may alter dietary choices and disrupt nutritional patterns. Many cancer patients tend to lose weight before treatment has even started, and while the cause of weight loss is not fully understood, insufficient intake of nutrients may be of importance as cancer patients often experience a loss of appetite and develop food aversions (where initially acceptable food becomes unappealing after its ingestion becomes associated with malaise) (Enig *et al.* 1987; Mattes 1994). The American Cancer Society (ACS) suggests that during active cancer treatment, maintaining caloric balance is

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the most important nutritional goal, and one may have to supplement nutrients if unable to meet nutritional needs based on diet alone (Brown *et al.* 2001). The ACS also advises that food choices during the treatment period should be easy to chew, swallow, digest, absorb, and should be appealing, even if they are also high in calories or fat (Brown *et al.* 2001). While such foods may be the most attractive choices and may even be beneficial for those who are calorie-deficient, patients who are able to maintain an appetite may wish to take a more nutritionally balanced approach to caloric consumption to promote both current and future states of health (Wayne *et al.* 2004).

Cancer patients undergoing active treatment have been reported to greatly modify their dietary intake based on either aversions to particular foods, or a drive to find the most nutritionally sound food choices in order to maintain optimal levels of health. It is important to support and encourage positive lifestyle changes, such as eating a properly balanced diet and healthful snacks to maintain strength, optimal weight and immune function during and after cancer treatment.

For more than 20 years, the Cancer Patient Support Program (CPSP) at Wake Forest University Baptist Medical Center (WFUBMC) has endeavoured to do just that, providing support for cancer patients and their families while addressing needs to improve physical and emotional well-being and quality of life. This support includes providing refreshments for patients waiting to be seen for treatments and medical appointments to encourage food consumption. For years, foods and beverages offered to the patients have been donated and/or selected by staff members; however, the patients had never been asked about types of food that they would like to consume during clinic visits. Therefore, we felt that it was appropriate to ask them in the format of an anonymous survey. Previously, no information was collected in the oncology clinics at our institution to ascertain information from patients about their food and beverage preferences during clinic visits. Further, to our knowledge, no similar survey has been published in the literature. We believe that such information could aid oncology clinic supportive staff to best tailor food and beverage item selection to the patients.

A survey was designed to determine food and beverage preferences among cancer patients in the haematology oncology and radiation oncology outpatient clinics at WFUBMC. The specific aims of the study were: (1) to characterize food and beverage preferences of the outpatient cancer treatment population to enable the CPSP to offer refreshments that meet patients' preferences; and (2)

to use data from this survey to develop educational programmes for patients based on patients' reported interests, food preference and selection. This survey was created to include possible food items that could be realistically offered within a clinic setting, given cost and storage constraints. The purpose of this paper is to provide the descriptive results of this survey.

METHOD

Study design

This study employed a single-administration, self-administered survey questionnaire. The survey assessed demographic information, dietary preferences (food and beverages), symptoms that could affect dietary intake, cancer treatment background, self-rated healthfulness of diet, interest in various nutrition services and current health behaviours (i.e. smoking, alcohol use).

Study participants

Study participants were a convenience sample ($n = 222$) of adult patients who were currently or previously treated in one of the oncology clinics at WFUBMC. Patients were eligible to complete the survey if they: (1) were at least 18 years of age; (2) had been diagnosed with cancer (any type or stage); (3) were being seen for medical appointments and/or treatment in outpatient haematology oncology or radiation oncology clinics at WFUBMC; and (4) could understand written and spoken English. Approval to conduct this survey was obtained from the Institutional Review Board (IRB) at WFUBMC. Informed consent was waived by the IRB because of the anonymous nature of the survey.

Procedure

Recruitment

Candidates were recruited to complete the study survey by a research assistant (JK). Patients were approached in the haematology oncology and radiation oncology clinics at WFUBMC to describe the study. In both clinic areas, participants were recruited while waiting for a medical appointment or treatment, or during chemotherapy treatments. In some cases, when possible, an introduction of the research assistant and study were made by the patient's treatment team.

Data collection

The research assistant provided the survey to willing participants to complete independently. She was available in

clinic to answer any questions while participants completed survey items. If needed, she administered the survey in an interview format, which only occurred four times. The majority of the surveys were completed in clinic; however, if participants did not have sufficient time to complete the survey, they were allowed to take the survey home and return it to the research assistant at a later time. Only three surveys were given out in this manner; of those, two surveys were returned.

Survey

Demographic information

The following demographic information was collected from all study participants: gender, age, race/ethnicity, marital/partner status, educational history, income and employment status. The following medical information was collected from study participants: primary cancer diagnosis, date of primary cancer diagnosis and past/current treatment regimen (chemotherapy, radiation therapy, surgery). Information was also gathered regarding diagnosis of secondary malignancies. Participants also provided information about their tobacco and alcohol use.

Food and beverage preference/interest in nutrition services

The questionnaire was developed specifically for this study to determine the most preferable types of foods and beverages in the midst of cancer treatment that would also be feasible to provide in a healthcare setting. Medical centre nutritionists provided input about additional possible refreshments and nutritional services that could be feasibly provided to patients in the clinic setting. Additional items were developed specifically for this study to determine patients' interest in various nutrition services. The items were rated on a Likert scale from 1 = least interested to 4 = most interested.

RESULTS

Out of 276 individuals who were approached to complete the survey, 222 individuals agreed to participate, yielding a response rate of 80.4%. Of those who agreed to participate, six surveys were not completed, yielding a completion rate of 97.3%. Demographic data for survey respondents are found in Table 1. The sample was fairly evenly divided between male and female respondents. The majority were non-Hispanic Caucasian and married; there was considerable variability in reported education and

Table 1. Study sample characteristics ($n = 219$)*

	<i>n</i> (%)
Gender	
Female	103 (46.6)
Male	116 (52.5)
Education	
Less than high school	17 (7.8)
High school graduate (or equivalent)	71 (32.1)
Vocational or associates	67 (30.4)
College grad	35 (15.8)
Credits post college or masters degree	26 (11.8)
Doctoral/professional	2 (0.9)
Job status	
Not currently employed	161 (72.8)
Employed, full time	50 (22.5)
Other	7 (3.2)
Marital status	
Single	16 (7.2)
Divorced or separated	28 (12.7)
Widowed	22 (10.0)
Presently married	151 (68.3)
Race	
White	195 (88.2)
African American	20 (9.0)
Hispanic	1 (0.5)
Other	1 (0.5)
Total annual family income (\$)	
<20 000	41 (18.5)
20 000 to 49 999	75 (33.9)
50 000 to 99 999	48 (21.8)
>100 000	31 (14.0)
Don't know	6 (2.7)
Most common types of cancer	
Breast	46 (22.0)
Lymphomas	36 (17.2)
Lung	31 (14.8)
Colon	22 (10.5)

*Missing data for some individual variables.

household income levels. The most common types of cancer were breast cancer, lymphoma, lung cancer and colon cancer, but respondents with various other types of cancer completed the survey as well. Chemotherapy was listed as the most common treatment among respondents, with 80% of respondents currently receiving chemotherapy. Less than 1% of respondents were currently receiving radiation therapy. At some points along the treatment path, 16% of respondents reported having previously been through chemotherapy treatment, 31% previously through radiation therapy and 40% had previously undergone a cancer-related surgery. In terms of other health behaviours, it was reported that 45% of respondents consumed alcohol in the 5 years prior to their cancer diagnosis, with 34% of respondents reporting recent alcohol consumption (ranging from once per year to daily). Following a similar trend, 62% of respondents had used some forms of tobacco prior to their cancer diagnosis, and

Table 2. Percentage of respondents endorsing preference for specific foods to be offered in clinic

Food	% reporting preference
Crackers with cheese or peanut butter filling	69
Doughnuts	63
Fruit cups	62
Cookies, oatmeal	57
Applesauce	54
Cookies, chocolate chip	53
Graham crackers	53
Soda crackers	52
Gelatin cups	51
Cookies, oreo	49
Animal crackers	47
Popsicles	47
Pudding cups	47
Yogurt	47
Cheese wedge	46
Granola bars	46
Pretzels	45
Muffins	44
Raisins	43
Cookies, oatmeal sandwich	40
Hard candy (peppermints)	40
Potato chips	38
Nuts (walnuts)	35
String cheese (mozzarella)	34
Hard candy (lemon drops)	33
Cereal packets (oatmeal)	29
Cottage cheese	28
Dry cereal	28
Cereal packets (cream of wheat)	23

18% of respondents were using some forms of tobacco (cigarettes, cigar, chewing tobacco/snuff, pipe) at the time of survey completion.

Foods and beverages the respondents were interested in having available during treatment were tabulated and summarized with frequency scores (see Tables 2 and 3). Foods requested by at least 50% of respondents included several types of crackers, doughnuts, fruit cups, cookies, applesauce and gelatin cups. Beverages requested by at least 50% of respondents included filtered water, coffee, soft drinks and various juices. In terms of patient preferences or specific dietary needs, the percentage of respondents requesting each of the following was: 45% for caffeine-free beverages, 37% for diet/sugar-free food choices, 31% for low-salt snacks and 30% for low-fat snacks.

This study also assessed participants' interest in nutrition education programmes for patients. The programmes that received the most interest included: recipes for patients with cancer (mean = 2.60, SD = 1.26), nutrition information/brochures (mean = 2.49, SD = 1.22), and individual counselling regarding foods to relieve treatment-related symptoms (mean = 2.32, SD = 1.24). In response to

Table 3. Percentage of respondents endorsing preference for specific beverages to be offered in clinic

Beverage	% Reporting preference
Water (filtered/bottled)	79
Coffee	77
Soft drinks	69
Juice, orange	63
Ginger ale	62
Juice, apple	61
Juice, grape	49
Juice, V8	48
Juice, cranberry	47
Hot cocoa	46
Juice, tomato	46
Lemonade	41
Tea (plain)	38
Milk	35
Tea (herbal or decaf)	35
Sports drinks	33
Liquid supplements (i.e. ensure/boost)	30
Instant breakfast	26

the item on the impact of nutrition on the development of cancer ('I think that diet and nutrition can impact the development of cancer. '), 4.7% strongly disagreed, 6.3% disagreed, 54.2% agreed and 34.7% strongly agreed. Finally, when we asked if their dietary intake had changed since their cancer diagnosis, 58% responded with 'yes' and 42% answered 'no', although we did not quantify whether the change was towards a more healthful diet or not.

DISCUSSION

We found that administering a survey in the clinic setting was feasible, as patients were willing to complete the survey, even during their treatments. We believe that active treatment for cancer is a critical time in patients' lives and it is imperative to determine which food and beverage choices they can best tolerate. To the authors' knowledge, this type of information (food and beverage selection) has not previously been acquired in a cancer centre setting. We felt this was important to evaluate as the patient's treatment regimens may require spending a large part of the day in the clinic. Food should be made available for patients to offset hunger and, potentially over the long-term, treatment-related weight loss.

Overall, the foods and beverages the participants in this study selected were mainly carbohydrate-based foods (i.e. crackers, fruit cups, cookies, gelatin cups, various juices). Selection of these foods is not surprising, as many patients experience gastrointestinal-related side effects due to their treatments, and these foods are easy to digest. A previous case-control study analysed food intake and nutritional

status among 34 diagnosed cancer patients, and 25 matched controls and found that sugar intake (measured on a scale of total energy intake) was significantly increased while intake of indigestible carbohydrates, vitamin B12, iron and iodine was significantly decreased in patients compared with controls (Enig *et al.* 1987). Overall, the study found that the foods and drinks consumed by cancer patients contained less protein and fat, but more sugar than those consumed by healthy respondents (Enig *et al.* 1987). From our survey, we found that participants requested low-sugar soda, while 63% of the patients requested doughnuts as a tolerable food choice. Findings from another survey of 50 cancer patients found that many indicated an aversion to protein-rich food and fat products, but had an elevated taste threshold for sweet foods (DeWys & Walters 1975). Similarly, in a study of 111 cancer patients, an aversion to meat, fish, poultry, fat products and high-protein foods was reported (Vickers *et al.* 1981). This experienced aversion to meat products and foods rich in protein and fat may be the causal mechanism in explaining why some patients show a stronger preference for sweet food choices during cancer treatment. We recognize that while these foods (sweet foods) are often the most attractive choices and may even be beneficial for those who are calorie-deficient, patients should continue to be encouraged to maintain a nutritionally balanced approach to caloric consumption to promote both current and future states of health (Wayne *et al.* 2004). However, as the ACS suggests, the most important part of nutritional support during treatment is delivering calories to the patient, even if the food choice is considered less healthful.

Research indicates that patients who are involved in their own care and take an active role in their treatment feel better and experience improved quality of life (Rosenbaum *et al.* 2004). By taking a proactive approach to making sound nutritional choices, it can be argued that this would improve a patient's self-efficacy, and subsequently improve his or her approach to recovery. Our survey participants indicated that they were most interested in recipes for patients with cancer as well as informational nutrition brochures; such requests may indicate a desire to educate themselves more on how different food choices can impact the way they feel and recover. This finding has prompted the CPSP programme leaders to be cognizant of patients' needs and desires.

While this study provided expansive pilot data, several limitations should be noted. First, this sample was a convenience sample. Respondents included both individuals in active treatment for cancer and those who had previously treated. Those previously treated provided retrospective responses about what they would have preferred

when in treatment. Further, some individuals might not have completed the survey due to physical illness or substantial physical side effects, resulting in a potential bias in those who completed the survey generally experiencing less anticancer therapy-induced side effects than those who did not. A second limitation of the pilot study was inclusion of all types of cancer. Our data did not allow use to distinguish between the differences in the effects of different types of cancer on nutritional preferences. Additionally, our main outcome was food preferences and not actual food intake. Food intake might have shown more conclusive shifts in what patients actually ate during chemotherapy treatment and how it might have deviated from what they were eating prior to diagnosis. It should be noted, though, that food preference checklists can serve as a proxy measure of food choices and eating habits, and while dislike is a strong predictor of non-use, more preferred foods are often reported as more frequently consumed (Drewnowski *et al.* 2000). Food preferences, a somewhat subjective measure of attitude, can be influenced by taste factors and a wide range of psychosocial issues (Drewnowski *et al.* 2000). Food preference checklists, however, provide a useful alternative to food frequency questionnaires in certain situations, such as this, where only specific food items that could be potentially offered to the patient in the clinic are of interest. Finally, the fourth limitation is that the food items that were offered by those in our CPSP have been offered for a number of years, so the patients may have indicated those choices more often because they are accustomed to having them offered. An example of this can be seen in the high response to doughnut preferences, given that a local doughnut manufacturer has generously donated this item to the cancer centre for many years, and patients may be inclined to have them offered, even though they may not represent a particularly healthful food choice.

Nonetheless, this survey provides meaningful information illustrating the importance of asking cancer patients about their particular snack/food preferences since those of the staff (who purchase the food) may not be the same as those of the patient. It remains an underlying goal of our CPSP to offer foods to patients that are the most tolerable while offering healthful options. We believe that efforts like this are truly significant in helping patients to feel as supported and comfortable as possible while going through the cancer treatment process.

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