Factors associated with the discrepancy between perceptions of meeting, and actually meeting, Canada's Food Guide recommendations for fruits and vegetables among breast cancer survivors

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ABSTRACT

This study aimed to compare breast cancer survivors' (BCS; N=169) body mass index (BMI), perceived competence in maintaining a healthy diet, value for a healthy diet, and diet- and weight-related stressors, across four discrepancy groups. The groups were created based on the discrepancy between perceptions of meeting, and actually meeting, Canada's Food Guide (CFG) recommendations for fruits and vegetables (FV). The study also described healthcare professional (HCP) involvement in providing nutritional advice after treatment and explored whether perceptions of meeting CFG recommendations were associated with HCP involvement. The discrepancy groups did not differ significantly in terms of BMI (p=0.26), diet-related stressors (p=0.84) and weight-related stressors (p=0.27); however two of the four groups differed significantly with regards to perceived diet competence and value of a healthy diet. Survivors who perceived they met CFG recommendations and actually met them had higher perceived diet competence (p=0.001) and placed more value on healthy eating (p=0.004) than those who perceived they did not, and actually did not, meet recommendations. Lastly, 43% of survivors reported that HCP had not provided them with any nutritional information after treatment. Those who perceived they met CFG recommendations did not differ significantly from those who perceived they were not meeting recommendations with regards to reports of HCP involvement in nutrition care (p=0.36). These results suggest that BCS who perceive they are meeting CFG recommendations and actually meet them place more value on healthy eating and are more confident in their ability to maintain a healthy diet after cancer treatment. In addition, the findings suggests that there is room to improve the delivery of nutrition information to BCS, and HCP need to play a more prominent role after treatment.

RÉSUMÉ

Le but de cette étude est de comparer chez des survivantes du cancer du sein (SCS; N=169) : leur indice de masse corporelle (IMC), leur perception de leur habileté à maintenir de saines habitudes alimentaires, la saine alimentation et leurs préoccupations au sujet de l'alimentation et du poids (PAP). Les SCS sont réparties en 4 groupes selon la divergence de leur perception à savoir si elles rencontrent ou non les recommandations en fruits et légumes (RFL) du Guide alimentaire canadien (GAC). Cette étude se penche aussi sur la participation des professionnels de la santé (PS) à fournir des conseils nutritionnels (CN) après les traitements et de vérifier si la perception des SCS à rencontrer les RFL du GAC est associée à cette participation. Les résultats montrent qu'il n'y a pas de différence significative d'IMC (p=0.26) ni de PAP (p=0.84;p=0.27) entre les 4 groupes en comparaison. Par contre, les SCS qui pensent rencontrer les RFL du GAC (et qu'elles les rencontrent vraiment) montrent de plus grandes compétences dans leur habileté à maintenir de saines habitudes alimentaires (p=0.001) et accordent plus d'importance à bien manger (p=0.004) que celles qui pensent ne pas les rencontrer (et qu'effectivement ne les rencontrent pas). 43% des survivantes ont déclaré ne pas avoir reçu, après leurs traitements, de CN de la part de leur PS. En ce qui a trait à la participation des PS à la santé nutritionnelle, les résultats ne montrent pas de différence significative entre celles qui pensent rencontrer les RFL du GAC de celles qui pensent ne pas les rencontrer (p=0.36). En conclusion, les résultats suggèrent que les SCS qui pensent rencontrer les RFL du GAC (et qu'elles les rencontrent vraiment) accordent plus importance aux saines habitudes alimentaires et sont plus confiantes en leurs habiletés à les maintenir après leurs traitements. De plus, selon les résultats, il y a place à l'amélioration dans la délivrance de l'informations aux SCS; et que les PS devrait jouer un rôle plus important ce sens après les traitements pour le cancer du sein.

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LIST OF NOTABLE ABBREVIATIONS

ACS – American Cancer Society

BCS – Breast cancer survivors

BMI – Body Mass Index

CCS – Canadian Cancer Society

CFG – Canada's Food Guide

FV – Fruits and vegetables

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1.0 INTRODUCTION

Breast cancer is the most prevalent cancer worldwide; accounting for 17.9% of all cancer diagnoses (1). It is estimated that one in nine Canadian women will be diagnosed with breast cancer in their lifetime (1). It is encouraging to note that in the past few years cancer survivorship has increased. More specifically, breast cancer survivors represent 40% of all female cancer survivors and 22% of the 10.1 million cancer survivors in the United States today (2). The scientific literature specific to cancer has been extensive, examining possible predictors of the disease, preventive measures that can be taken, as well as its psychosocial effects (3-5). Studies examining breast cancer survivors have become increasingly more common as survivorship has increased dramatically over the past decade (1). Research on the importance of adopting a healthy lifestyle after cancer has suggested that diet and exercise can have positive effects on the body and mind – possibly preventing primary cancer diagnoses, psychological distress, and recurrence in survivors (3,6-8). The pressure of maintaining a healthy lifestyle may add to the already stressful lives of cancer survivors and thus it is critical that they are educated about the importance of adopting a healthy diet and physical activity patterns sooner rather than later. If breast cancer survivors are able to take a proactive approach and make positive health changes in their lives where it is possible and manageable to do so, stressors related to health may be reduced, body weight may be controlled, and health-related quality of life may subsequently be optimized.

Past research has suggested that stress is directly linked to physical and emotional health (9,10). It has been hypothesized that physical illness can be both a predictor and an outcome of stress. An adverse health outcome, such as cancer, may

lead to physical, emotional, and/or psychosocial stress. These stressors may in turn exacerbate the adverse health outcome, or lead to other negative health outcomes (11). Many breast cancer survivors have reported stressors similar to those of healthy Canadian women; however, they also encounter additional physical changes that can contribute to stress (12-15). Weight gain has been reported among many breast cancer survivors and has been linked to a number of factors including coping style, social support, eating behaviour and physical activity (15). In fact, weight gain and body image dissatisfaction are common among breast cancer survivors and are negatively associated with quality of life and increased anxiety and stress (17-28). Unfortunately, many (estimates around 48%) breast cancer survivors are overweight or obese which could greatly influence their long-term physical and mental health (29). Modifiable factors such as physical activity, lower sedentary behaviour, and healthy diet may be targeted behaviours for weight change among breast cancer survivors, and among women for prevention of breast cancer.

Specifically, among other guidelines such as Canada's Food Guide, the Canadian Cancer Society (CCS) has developed guidelines for cancer prevention which include eating at least five servings of fruits and vegetables daily, as well as reducing fat intake (3). These guidelines provide a goal for individuals to achieve in order to prevent cancer, or to help reduce the likelihood of recurrence once cancer has been diagnosed. Unfortunately, these guidelines may also foster experiences of stress and concern for meeting diet recommendations (30). Despite these concerns, Anis and colleagues found that physicians counsel their patients on dietary habits only 25% of the time (31). Without proper counselling and education about eating a balanced diet, it may be argued that breast cancer survivors may not adhere to the current dietary recommendations due

to lack of knowledge, or may believe their dietary habits are better than they actually are. The discrepancy that exists between actual and perceived abilities to meet guidelines is likely due to the lack of tools and knowledge about diet that should be provided by healthcare professionals. This lack of knowledge, coupled with the stress that comes with cancer diagnosis and weight and appearance changes, may increase overall stress of breast cancer survivors. Stress may have negative outcomes on health, exacerbating existing health issues and increasing risk for cancer recurrence. This vicious cycle further highlights the importance of identifying stressors of breast cancer survivors, specifically those related to diet and weight. Diet and weight are modifiable risk factors associated with a number of adverse health issues such as cardiovascular disease, diabetes, and obesity (32). With the proper education and counselling, appropriate dietary changes can be made that still allow enjoyment of food and satiety with the added benefits of possible weight loss and reduction of diet- and weight-related stress, all of which can aid in maximizing health-related quality of life in breast cancer survivors. Furthermore, education and counselling will also provide breast cancer survivors with the tools to change their behaviours and the knowledge to understand dietary recommendations and their importance for overall health. The purpose of this study is to examine whether breast cancer survivors in the Montreal area perceive they are meeting the fruit and vegetable recommendations provided by Canada's Food Guide, and whether they are actually meeting these recommendations, and to identify any associations this discrepancy may have with BMI and diet- and weight-related stressors. Furthermore, given the known association between perceptions of competence (self-efficacy) and value/importance perceptions towards behaviours such as diet, a secondary aim of this study is to examine whether perceptions of competence and value

differ across groups (33). Finally, as healthcare providers play an integral role in cancer treatment and management, this study will also explore whether healthcare professionals provide breast cancer survivors with nutritional information after cancer treatment.

2.0 LITERATURE REVIEW

Cancer accounted for 7.6 million deaths in 2008 worldwide (32). The World Health Organization (WHO) recognizes cancer as one of the leading causes of death worldwide and projects that mortality will increase further to 12 million deaths in 2030 (32). The CCS projected that an estimated 173,800 new cancer cases would be diagnosed in Canada in 2010; 23,200 of which would be breast cancer. Breast cancer is the most commonly diagnosed cancer and the second most common cause of cancer death among women, making it a serious public health concern (1). While one in nine Canadian women will be diagnosed with breast cancer in her lifetime, over two-thirds of those diagnosed (87%) will survive at least five years (1).

Like many cancer survivors, women who survive breast cancer often experience distress concerning drastic lifestyle changes that may have occurred during or following diagnosis and treatment– namely, fear of recurrence and the toll the disease takes on their physical and mental health (16,27,34-36). Researchers have suggested that cancer diagnosis can have somewhat of a 'domino effect', eliciting a string of psychological responses, many of which can lead to anxiety, extreme stress, and depression (37). The stress of diagnosis and the changes undergone throughout treatment and recovery may affect each woman differently: some women may react by coping effectively while others may react negatively, possibly exacerbating symptoms and worsening their physical and mental health. Psychological distress in cancer survivors has been linked to

a number of factors: younger age, negative body image, pre-existing psychological issues such as depression and anxiety, as well as a family history of psychological distress (38). Survivors are advised to follow the appropriate lifestyle recommendations in order to decrease their risk of recurrence as well as improve their psychosocial health; however, it is relatively unknown whether their knowledge translates into active behavioural changes (3). Furthermore, the literature on the diet- and weight-related concerns of breast cancer survivors is sparse (39-41). An increased focus in this area of research would enable healthcare professionals to better understand this growing population and in turn cater to their individual needs in hopes of improving their overall wellbeing.

2.1 Stressors of Breast Cancer Survivors

Extensive research on the breast cancer population has led to strong suggestive evidence that breast cancer does increase psychological distress and reduces quality of life (16,25-27,30,34-37,42-48); however, assessment of specific stressors that are responsible for stress, including diet and weight, have not been examined in depth. Research has shown that women who practice risk-reducing behaviours such as eating the recommended daily servings of fruits and vegetables report being less negatively impacted by their diagnosis than those who do not engage in these behaviours (37). Furthermore, Maunsell and colleagues found that women who reported changing their diets following cancer diagnosis were more distressed initially compared to those who did not make changes. Moreover, these women also experienced greater decreases in psychological distress over a 12-month period. These findings suggest that dietary

changes may not only benefit breast cancer survivors by maximizing their overall nutritional status, but also by improving their psychological wellbeing (8).

There are many underlying causes for psychological distress that manifest after cancer diagnosis. Factors including age, prior history of stress, and lack of social support can affect a woman's psychological health after a traumatic experience such as cancer (48). However, if modifiable factors such as diet and exercise can reduce overall stress and improve quality of life, it is important to ensure that breast cancer survivors are being informed of ways in which they can change health-related behaviours that may reduce stress.

Several studies have focused on the psychological distress experienced by women following breast cancer diagnosis, all of which have had similar findings (25,27,30,37,45,47). Lauver and colleagues conducted one of the few studies that have focused specifically on identifying stressors among breast cancer survivors (27). New cancer survivors were assessed at one month post treatment and again three to four months after treatment. At four months following treatment, 26% of survivors reported being stressed about their bodies. In response to open-ended interview questions about common stressors, 41% of the women found dealing with side effects of their treatment to be stressful. Furthermore, 5% of women reported changes in body image as being a stressor (27). Although Lauver's study did not include many stressors specific to diet or weight, women did report being stressed about changes their body underwent during treatment. As weight gain is a common change experienced by breast cancer survivors, negative body image may ensue. Following this study, Hadd and colleagues conducted a study examining stressors of breast cancer survivors which included diet- and weight-related stressors (30). The women in the study had a mean body mass index (BMI) of

25.8 kg⁄m^2 and were free of cancer for an average of 5.9 years. The study found that stress about making the right dietary choices was experienced more often than any other stressor apart from exercise-related stressors. Other stressors commonly experienced included feeling overweight and changes in appearance resulting from treatment (30). Taken together, the two studies which focused on stressors among breast cancer survivors suggest that diet and appearance/body image are critical antecedents to stress and emotion processes. It is therefore important to better understand factors associated with the experience of diet and appearance/body-related stressors.

Cancer survivors must focus on their health during and after treatment. Women often make health-related goals following diagnosis and treatment to reduce their risk of further complications. Most often, goals include improving physical activity, losing weight, and eating a healthier diet (27). These goals suggest that women worry about their health after cancer and hence focus on goals that will reduce stress-inducing feelings.

2.2 Weight Gain

Weight gain, often characterized by a simultaneous increase in body fat mass and a decrease in lean body mass, has been commonly reported among women diagnosed and treated for breast cancer (14,15,18). This weight gain has been shown to impact women negatively, leading to stress and decreased quality of life (16-19). Researchers have been attempting to find the underlying causes of weight gain after diagnosis of breast cancer for the past three decades. One of the first studies conducted to find a relationship between breast cancer and weight gain was done in 1978 (49). Following Dixon's study, a number of studies began to find a link between adjuvant

chemotherapy and weight gain (20,21,50). Types of adjuvant chemotherapy regimens, or chemotherapy administered following tumour removal, often varies. Research has shown that doxorubicin plus cyclophosphamide, which is often administered for a shorter duration, results in more modest weight gain than the treatment combination of cyclophosphamide, doxorubicin and 5-fluorouracil or cyclophosphamide, methotrexate and 5-flourouracil (51). However, type, dosage, and length of treatment were not the only factors associated with weight changes among women with breast cancer. Others found that factors including diet, physical inactivity, time since diagnosis, depression and anxiety may all play a role in weight changes (18,51-53).

With rates of overweight and obesity on a dramatic increase worldwide, obesity prevention has become a priority (20). However, there has been a gap in research specific to weight gain and cancer (4,54-59). A review of published studies which examined the association between weight gain and breast cancer recurrence found increased BMI and body weight to be a risk factor for cancer recurrence, death, or both (55). Using data from the Nurses' Health Study, it was reported that those who gained between five and 10 pounds after diagnosis had 50% higher rates of breast cancer recurrence or death (58). Other studies in parallel with Kroenke and Rock have shown that overweight breast cancer survivors tend to have poorer prognoses, and obese breast cancer survivors have a higher mortality rate in contrast to normal weight survivors (7,60,61). However, not all findings were consistent, with other studies showing no association between weight gain and disease progression (14,21,55). More research examining the effects of weight gain, before and after cancer diagnosis, is required to determine with more confidence whether a relationship exists between weight and cancer recurrence.

The interventions which focused on weight loss and prevention of additional post-diagnosis weight gain have had equivocal results (15,62-64). Loprinski and colleagues found that dietitian counselling specific to weight loss strategies and nutrition resulted in insignificant reductions in both calorie consumption and weight gain (63). However, the two interventions which combined physical activity with dietary changes both resulted in significant weight loss in overweight participants (15,64). A multidisciplinary approach was taken in a study by Goodwin and colleagues whereby psychosocial support and nutrition support were provided to breast cancer survivors. The combination of psychosocial support, individualized diet counselling, strength and flexibility training, aerobic activity, and regular everyday activity such as climbing stairs, resulted in weight changes that were not significantly different from zero (no weight gain observed); however, significant weight loss was observed in obese breast cancer survivors (15). These findings suggest that a multidisciplinary approach may be required to reduce weight gain and promote health among overweight and obese breast cancer survivors.

Dramatic changes in body weight have been reported to be the most distressing side-effect of treatment among women diagnosed with breast cancer (14,17,20,21,22,55,65-68). A study of African-American breast cancer survivors showed that most women, regardless of whether they gained or lost weight due to diagnosis and treatment, reported the changes as being major stressors contributing to psychological distress and concerns about their health and wellbeing. Much of the stress was related to the women feeling that their weight was out of control and was not a result of any of their behaviours (69). Furthermore, weight gain has been shown to negatively impact body image, increase anxiety and distress, and reduce quality of life among breast

cancer survivors (17-27). Demark-Wahnefried suggested that breast cancer survivors find weight gain undesirable due to its association with increased risk of cancer recurrence, diabetes and hypertension (18).

Physical changes are inevitable for those diagnosed with breast cancer; however it is important to view weight gain as a potentially modifiable risk factor rather than an uncontrollable result of cancer. With the appropriate help and education, weight may be controlled and managed in a way that does not inflict additional stress on breast cancer survivors.

2.3 Diet Changes

A serious life change like breast cancer and the weight gain associated with diagnosis may elicit the desire to change one's lifestyle in hopes of reducing the risk of cancer recurrence. Studies show that 40.4% of those who choose to make lifestyle changes after cancer diagnosis do so by altering their diet (70). Alarmingly, research has suggested that an estimated 35% of cancer deaths can be avoided with the help of dietary changes (71-73). Understanding the diet changes most often made by breast cancer survivors may aid in the development of interventions and individualized health promotion practices that focus on doing what is best and most feasible for each survivor based on their current knowledge and behaviour.

A number of organizations have developed guidelines to provide diet and exercise recommendations for cancer prevention (3,74). The CCS and the American Cancer Society (ACS) Guidelines for cancer prevention now recommend the consumption of five or more daily servings of vegetables and fruits, choosing whole grain options in the place of refined sugars, and limiting consumption of red meats or

those high in fat (74). Although there are no current guidelines specific to cancer survivors, cancer prevention guidelines are used for primary prevention as well as prevention of cancer recurrence. In addition to the cancer prevention guidelines, Canada's Food Guide (CFG) is also a well known source for dietary recommendations (75). Canada's Food Guide is comprised of age and gender specific recommendations for each major food group, as well as physical activity recommendations and tips for adopting a healthy lifestyle. More specifically, CFG recommends that women aged 19 to 50 years consume seven to eight daily servings of fruit and vegetables, and women 51 years old and older are recommended to consume seven daily servings (75). The emphasis on consumption of vegetables and fruits has been directed towards people of all ages as they are rich in vitamins and minerals which aid in fighting off infection and illness (3).

Fruit and vegetable consumption differs by age and gender in the general population. The Canadian Community Health Survey shows that on average, women between the ages of 31 and 50 years old consume 4.92 daily servings of fruits and vegetables, which is substantially less than the recommendations suggested by CFG (13,75). More importantly, as women advance over 70 years of age, their daily consumption drops to 4.76 servings, significantly less than women between the ages of 51 and 70 years old (13). A large cohort study (n=2,321) in the United States showed that early breast cancer survivors consume only 4.1 to 4.3 servings of fruits and vegetables per day (53). Furthermore, patterns of consumption appear to be similar to those of healthy women, with survivors over 70 consuming only 4.05 servings daily (13,53). It is noteworthy that half of breast cancer diagnoses occur in women between the ages of 50 and 69, and more deaths from cancer occur in women over 80 years old

(1). Therefore, it is important to focus on breast cancer survivors over 50 as they tend to consume less than the recommended daily servings of fruits and vegetables, and as they age, chances of mortality due to breast cancer diagnosis increase (1, 53).

There have been a number of hypotheses proposed to describe the possible mechanisms by which vegetables and fruit may protect against breast cancer progression. One mechanism involves fruit and vegetable effects on gonadal hormones, hormones that have a key role in mammary cell growth and function (76). Because breast cancer is a hormone-dependent disease, it is believed that by minimizing estrogen stimulation after diagnosis, it is possible to manage the cancer, as estrogen has a proliferative effect on mammary cells (76,77). Many diet-related studies that focus on breast cancer management are based on the hypothesis that a diet low in fat and high in fibre may change the status of hormones responsible for mammary cell growth. These studies have had promising results – showing that a low-fat diet, characterized as a diet of which 10 to 25 percent of calories come from fat, can reduce serum estradiol concentrations by as much as 23% in postmenopausal women (78). However, it should be noted that with fat reduction also came an increase in overall fibre intake as well as weight loss in many of the studies, therefore it is difficult to predict with any degree of certainty which of the factors were responsible for the lowered serum estradiol concentrations (78). Studies have shown that diets with 28 to 45 grams of fiber, such as those rich in whole grains and vegetables, can reduce estrogen concentrations by increasing fecal excretions of estrogens (78,79). In addition to fibre and fat, carotenoids, which increase in the tissue in response to a diet high in fruits and vegetables, have also been shown to have an inhibitory effect on mammary cell growth (80). With studies such as these, fruit and vegetable intake is being emphasized as a possible mechanism

by which to improve breast cancer prognosis and contribute to management of the disease.

Cancer prevention recommendations also place emphasis on fat reduction, although, studies have shown conflicting results regarding cancer survival and recurrence (6,7,55). Two important intervention trials, the Women's Intervention and Nutrition Study (WINS) and the Women's Healthy Eating and Living Study (WHELS) examined the effects of a dietary intervention on the risk of cancer recurrence. Although the two trials differed in their results pertaining to the effect of fat intake on cancer recurrence, the success of the dietary intervention was statistically significant. Specifically, the WHEL study showed that at the 12-month follow-up, the intervention group increased their daily fruit and vegetable consumption from 7.4 servings to an average of 12 servings, and at the four-year follow-up, the intervention group was consuming a mean intake of 65% more vegetables, 25% more fruit, 30% more fibre, and 13% less energy intake from fat (7). Although the WHEL study found no additional benefit of adopting a diet high in fruits and vegetables and low in fat, the WIN study did find that reducing dietary fat intake was associated with longer relapse-free survival among breast cancer survivors (6). The conflicting results from these two studies suggest the need for further trials to examine the effects of diet on cancer recurrence; however, the intervention groups did improve their diets, implying that dietary interventions directed towards breast cancer survivors can be successful in altering health behaviours (6,7). Despite the results from the WHEL and WIN studies, it is still important to acknowledge the benefits of eating a balanced diet. Healthy eating not only helps in maintaining a healthy weight and reducing the risk of obesity, but also reduces

the risk of other chronic illnesses for which breast cancer survivors are already at an increased risk due to their existing health condition (39).

2.4 Value and Perceived Competence

Research suggests that motivation, and perceptions of value and competence are strong predictors for adopting healthy lifestyle behaviours (33,81,82). Breast cancer survivors appear to be motivated to change their lifestyles in order to reduce the risk of cancer recurrence (30,60). While there is little evidence focused specifically on perceptions of competence and value for healthy eating in this population, evidence from behaviour change theories and empirical studies in other domains suggest that these self-perceptions are critical to actual behaviour change (33,60,81,82,). Many survivors consider diet to be a factor that contributes to their disease (39,41,60,70,83,84). In a study determining motivators of health behaviours after diagnosis, 69% of the women reported changing their diets due to concern about cancer, and 85% believed that diet could alter the course of the disease (39). However, lack of knowledge, low perceptions of competence to eat a healthy diet, and lack of interest and enjoyment of eating healthy are barriers to making lifestyle changes. Unfortunately, a gap exists in diet, nutrition and cancer literature that examines self-perception and its association with diet-related attitudes and beliefs. In a study examining readiness to pursue lifestyle changes, a large percentage of breast cancer survivors reported that their health was between good and excellent. Despite their perceived health quality, it was surprising to find that less than 50% of the respondents ate five daily servings of fruits and vegetables, a recommendation emphasized by the CCS (3,39). A number of other studies were in parallel with these findings, with the majority of participants failing to

consume five servings of fruits and vegetables (40,70,85,86). These studies suggest that breast cancer survivors may or may not be meeting fruit and vegetable recommendations; however, regardless of their actual dietary habits, their lack of knowledge and understanding of the guidelines may be leading to false perceptions of their health and diet quality. Furthermore, although there is a gap in this area of cancer research, value placed on eating well as well as perceived competence to maintain a healthy diet may also play a role in perception of diet quality. Research in this area is required in order to determine whether breast cancer survivors' perceptions of whether or not they are meeting CFG recommendations are consistent with whether or not they actually meet them. If most breast cancer survivors' perceptions differ from their actual diet quality, it could be due to a lack of perceived competence, low levels of interest or value in healthy eating, and/or a lack of guidance and individualized counselling from healthcare professionals. Furthermore, this discrepancy may lead to distress and concern about meeting fruit and vegetable recommendations. More research in this area will enable healthcare professionals to advise cancer survivors on CFG recommendations and in turn give women the tools and confidence they require to both perceive they are meeting dietary recommendations and actually meet them.

There is strong suggestive evidence that breast cancer survivors are ready to pursue lifestyle changes, more so than other survivors (8,39). In a study 978 men and women with prostate and breast carcinomas, respectively, breast cancer patients were more likely to consume more than five servings of fruits and vegetables as well as less than 30% of their total calories from fat, compared to prostate cancer patients (39). Despite these practices, if cancer survivors are not properly educated on effective and healthy ways to alter their behaviours, many may not be adopting and maintaining the

appropriate behaviours that are required to maximize their health (8,39,41,60,87). Additional research in this area is required in order to evaluate how much breast cancer survivors know about healthy eating.

2.5 Healthcare Professionals

Follow-up care is an important and necessary part of cancer survivorship because it helps patients monitor their health in hopes of detecting and treating recurrences, as well as other illnesses that may manifest over the years (88). Even still, research on physicians' advice and counselling has not been targeted towards cancer survivors. Few studies have examined the role of physicians in counselling patients about dietary habits and exercise (31,89-91).

The health belief model and the transtheoretical model, or "stages of change" theory, suggest that patients who perceive themselves as having an adverse health outcome, or are contemplating changing their behaviours, are likely to take action if prompted by a cue such as physician's advice, or materials found in a healthcare setting (92-95). If both healthcare professional advice and materials are used collectively, the effects of both may be greater on patients' knowledge and understanding, perhaps leading to behaviour change.

There are few studies that examine the effects of physicians' nutritional advice on behaviours (96-99). Cancer survivors have been known to take the advice of healthcare professionals seriously, and recommendations from a doctor or other healthcare professional often convince patients to take action and make dietary changes (31,40,41,83,90,100). Despite suggestive evidence of weight- and diet-related concerns among women, research has shown that physicians do not advise their patients on

dietary recommendations on a regular basis (31,90). A study by Anis and colleagues found that physicians counsel their patients on dietary habits only 25% of the time (31). Furthermore, in a study examining health behaviours of breast and prostate cancer survivors, 35% of the participants reported that their physician recommended a low fat diet; however far fewer reported receiving any advice on fruit and vegetable consumption (39). These suboptimal counselling rates do not coincide with the National Disease Prevention objectives and practice guidelines which justify the need for physicians to advise their patients on health behaviours such as smoking cessation, physical activity, and healthy eating, more routinely (101-103).

Healthcare practitioners should consider new cancer survivors to be optimal candidates for counselling and intervention. They should take advantage of the "teachable moment" in which patients are most likely to follow instructions and do their best to make healthy lifestyle choices. The fact that a large percentage of breast cancer survivors believe they are in good health despite not meeting dietary recommendations implies that many are not aware of the guidelines that are available to them (104). Adhering to the dietary guidelines will not only help maintain a balanced diet and possibly reduce cancer recurrence, but survivors can subsequently manage their weight by understanding what their body requires, increasing consumption of nutrient-dense foods and minimizing energy-dense foods that do not provide nutrients. Unfortunately, very little is known about the diet of breast cancer survivors, making it difficult to assess diet quality and make necessary changes (104). Additional research in this area can help healthcare professionals gather more information about the diet quality of breast cancer survivors. With this information, counselling groups and intervention strategies can be

formed that target early breast cancer survivors and educate them on the dietary guidelines that are available to them.

Despite results showing that some physicians do offer dietary advice to patients, whether or not the advice is correct, consistent and reliable has not been discussed in past studies. One study examining whether or not physicians provide advice on exercise found that two-thirds of physicians reported that they do talk to their patients about exercise. However, the same study showed that only 12% of the physicians asked to complete the survey were aware of the American College of Sports Medicine physical activity recommendations (105). These findings bring into question how reliable physicians are when it comes to diet and exercise advice and whether patients should refer to other healthcare professionals for information regarding these health issues. Unfortunately, evidence of nutrition counselling following breast cancer by a dietitian is lacking, therefore it is difficult to say whether or not breast cancer survivors are getting the nutritional help from the appropriate health professionals.

Breast cancer survivors are faced with a number of adverse health outcomes: many are overweight or obese, distress is very common, and like all cancer survivors, fear of recurrence is a constant concern. Therefore, ensuring that these women are actively involved in making healthy lifestyle choices is crucial as dietary habits and physical activity are important modifiable risk factors for heart disease, diabetes, hypertension, and stroke (97,101,106,107). After surviving a critical illness such as breast cancer, reducing their risk for any other complications should be a top priority – one that should be emphasized by healthcare practitioners. If patients feel that their physicians, dietitians, nurses, or other healthcare practitioners are providing them with

information about healthy eating and exercise, through both counselling and take-home materials, the likelihood of positive behavioural changes may significantly increase.

3.0 RATIONALE AND STUDY AIMS

Life after cancer is typically daunting and often very stressful (25,27,34-37,42-44,46-58). Maintaining a healthy lifestyle as a breast cancer survivor requires women to feel confident in taking control of both their physical and mental health. The completion of treatment may increase anxiety about recurrence, and getting back to a regular life often means taking on prior familial responsibilities while attempting to take care of one's own health (30,34,35). Given the potential risk for adverse health outcomes due to an unhealthy lifestyle; diet, weight and stress management are even more important than they were prior to diagnosis (9,16,97,101,106-108). The majority of studies on nutrition and breast cancer have focused on diet, weight, and stress independently of one another; however, there has been a void in the research examining stress and weight relative to diet. In addition, despite theoretical evidence that suggests a relationship between perceived competence and value and behaviour change, research examining these factors in a diet context is lacking (81,82). Seeing as diet, weight and stress can often be interrelated, examining the relationship among these three factors as they relate to breast cancer survivors may be very helpful for healthcare professionals as they consider health promotion strategies.

Breast cancer survivors may not be confident in their abilities to make lifestyle changes due to their lack of knowledge on the dietary recommendations available to them. However, there is suggestive evidence that breast cancer survivors place value and importance on healthy eating, and are motivated to make lifestyle changes to better

their overall health (60). These high values may play a critical role in the success and maintenance of diet changes. Although breast cancer survivors may place value on healthy eating, research suggests that breast cancer survivors' perceptions of their health may be inaccurate, which can negatively affect their dietary behaviours and prevent them from making changes where change is required (39). For this reason, breast cancer survivors may not alter their diet to include healthier options due to a false belief that they are meeting guidelines when they are not. Moreover, false perceptions of their health and diet quality may lead to unnecessary stress that in turn can exacerbate their overall health. A multidisciplinary approach which involves a number of healthcare professionals must be taken to ensure patients get the information and care they need to feel confident in their ability to manage their health after cancer.

It is essential for breast cancer survivors to know and understand the dietary recommendations that are available to them, and CFG is an excellent tool for breast cancer survivors to be familiar with. Physicians and oncologists have reported their own lack of nutritional knowledge as well as time constraints as barriers to delivering dietary advice to their patients (109). These reports suggest that dietitians should be more involved in breast cancer survivor care. Before this can be done, more research is required to examine the health of the population so that care can be individualized to patients according to their current health status and knowledge. Furthermore, breast cancer survivors are a heterogeneous group comprised of women, and men, of different ages, socioeconomic status, weight, physical health status, and mental health status. Each person is at a different stage of lifestyle change, many of whom may not know how to change their behaviours and require guidance. With more information healthcare practitioners can focus on providing breast cancer survivors with the appropriate

knowledge and counselling they require. With more knowledge and confidence in their ability to follow dietary guidelines, breast cancer survivors can manage their diet and weight, and in turn reduce any stress that may result from these modifiable factors.

4.0 PURPOSE

The purpose of this study was to examine the discrepancy between perceptions of meeting, and actually meeting CFG recommendations for fruits and vegetables (FV) among breast cancer survivors (BCS) in the Montreal area, and to identify any associations this discrepancy may have with BMI, perceptions of diet competence, value of healthy eating, and diet- and weight-related stressors. A secondary aim was to describe the role of the healthcare practitioner in providing diet-related information.

The following research objectives were developed:

1. Examine mean differences of BMI, perceived competence in maintaining a healthy diet, value of healthy eating, and diet- and weight-related stressors among BCS who: (i) perceive they are meeting CFG recommendations for FV and actually meet them (Positive Match); (ii) perceive they are meeting CFG recommendations for FV but fail to meet them (Positive Mismatch); (iii) perceive they are not meeting CFG recommendations for FV but actually meet them (Negative Mismatch); and (iv) perceive they are not meeting CFG recommendations for FV and fail to meet them (Negative Match).
2. Describe healthcare professional involvement in providing nutrition information to BCS and determine whether healthcare professional involvement differs among those who perceive they are meeting CFG recommendations and those who perceive they are not meeting

recommendations, and those who actually meet CFG recommendations and those who fail to meet them.

It was hypothesized that BCS in the Negative Mismatch and Negative Match groups would report higher mean scores on diet- and weight-related stressors compared to women in the Positive Match and Positive Mismatch groups. Women who perceived they met CFG recommendations for FV (Positive Match and Positive Mismatch groups) would report higher perceptions of competence and value for eating a healthy diet compared to those who perceived they did not meet CFG recommendations (Negative Mismatch and Negative Match groups). Furthermore, it was hypothesized that more than 50% of BCS would be overweight or obese. Lastly, at least 30% of survivors would report a lack of HCP involvement in providing nutritional information, and a significantly larger proportion of those who perceived they met recommendations as well as those who actually met recommendations would report getting HCP advice on nutrition, compared to their respective counterparts.

5.0 MANUSCRIPT

The discrepancy between perceptions of meeting, and actually meeting, Canada's Food Guide recommendations for fruits and vegetables and its association with diet- and weight-related factors among breast cancer survivors

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5.1 Abstract

Background: Breast cancer survivors (BCS) consume considerably fewer fruits and vegetables (FV) than Canada's Food Guide recommendation (CFGR) of 7-8 servings/day; however, their perceptions of whether they meet recommendations remain unclear. Perceptions of meeting recommendations may be associated with a number of factors, including diet- and weight-related stressors (DWS), which are often experienced by BCS. This study aimed to examine whether diet and weight-related factors, including prevalence of DWS, differ depending on perceived diet quality, particularly with respect to FV consumption.

Purpose: (1) To examine differences in body mass index (BMI), perceived diet competence, value of a healthy diet, and DWS across four groups of BCS created based on the discrepancy between perceptions of meeting, and actually meeting Canada's Food Guide recommendations (CFGR) for FV ; and (2) to describe HCP involvement in providing nutritional information to BCS.

Study Design: Data from 169 BCS 8-20 weeks post-treatment were included in the analyses. FV consumption was assessed using a modified version of the Rapid Risk Factor Surveillance System (RRFSS) questionnaire. Perceptions of meeting CFGR for FV, perceived diet competence, value of a healthy diet, DWS and HCP involvement were assessed using self-report questionnaires. BCS were categorized into four comparison groups: (i) Positive Match: perceived they met FV recommendations and actually met them; (ii) Positive Mismatch: perceived they met FV recommendations but did not; (iii) Negative Mismatch: perceived they did not meet FV recommendations but

met them; (iv) Negative Match: perceived they did not meet FV recommendations and did not.

Results: Mean (±*SD*) age was 54.4±10.8 years old. Sixty-six percent of BCS failed to meet CFGR for FV. Sixty percent of BCS reported diet-related stressors (i.e. concerns for making healthy dietary choices) often or very often. No significant differences were found across the four groups for DWS and BMI. Women in the Positive Match group had higher diet competence and placed more value on healthy eating than those in the Negative Mismatch and Negative Match groups ($p<0.05$). Finally, 43% of BCS reported having not received dietary advice from a HCP.

Conclusions: Despite a lack of group differences with regards to DWS and BMI, those who perceived they were meeting guidelines and actually met them were more confident in their ability to maintain a healthy diet, and placed more value on healthy eating. Future research should focus on healthcare professional involvement in managing and coping with diet-related factors within this population.

5.2 Introduction

Cancer is a major public health concern worldwide, accounting for 7.6 million deaths globally in 2008 (1). Breast cancer has been named the second most common cancer in the world, and is the most widespread cancer in women (2). In 2009, there were an estimated 22,700 new breast cancer cases in Canada, and 5,400 breast cancer-related deaths (3). In the United States, there were 194,280 new cases of breast cancer and 40,610 deaths related to breast cancer (2). Breast cancer survival rates have increased significantly since 1975, with approximately 87% of those diagnosed surviving at least 5 years (2). As more women are surviving breast cancer, additional emphasis needs to be placed on adopting healthy lifestyle behaviours in order to maximize well-being during survivorship and prevent additional adverse health outcomes.

Breast cancer survivors experience a number of physically and mentally taxing changes after cancer diagnosis. Weight gain is a common side effect of breast cancer, with gains often ranging from 2.2 to 6.0 kilograms (4-6). Weight gain after breast cancer diagnosis has been associated with elevated risk of cancer recurrence and mortality, with the risk increasing with increases in weight gain (6). In addition, greater weight gains have been associated with increased levels of distress, suggesting that weight gain, or weight-related stressors may have a negative impact on psychological health and overall quality of life (7). This weight gain is the result of a number of factors, including adjuvant therapies, physical inactivity, depression, and diet (8-12). In relation to the latter, women commonly bring changes to their diet, most notably by increasing fruit and vegetable intake (13-15). In spite of these diet changes, research suggests that breast cancer survivors have suboptimal fruit and vegetable intake when compared to Canada's

Food Guide (CFG) recommendations of seven to eight servings per day (16-18). Fruit and vegetable consumption has been related to mortality in the past, with one study showing survivors who consumed less than 3.5 servings per day experienced higher mortality rates than those consuming greater amounts of fruits and vegetables daily (18). These findings suggest that fruit and vegetable consumption likely plays a significant role in the overall health of breast cancer survivors and should therefore be promoted during and after treatment.

Breast cancer survivors often attempt to change their diets after diagnosis, suggesting that diet is important to cancer survivors (13-15). However, maintenance of behaviour changes, such as diet, are more complex than simply attempting change. Although there is little evidence specific to the diet context, behaviour change theories suggest that perceptions of competence and value are critical for shaping actual behaviour change (19,20). A gap exists in cancer literature on perceptions of competence to maintain a healthy diet and value of healthy eating. Not only do perceptions of competence and value of a healthy diet likely play an integral role in behaviour change, but these perceptions may also impact overall perceptions of diet quality and frequency of diet-related stressors (i.e. concerns for making healthy diet choices). If breast cancer survivors place value on healthy eating, and have low perceived competence in maintaining a healthy diet, this may contribute to diet-related stressors.

To date, little research has been done in relation to diet- and weight-related stressors among breast cancer survivors. One study examined sources of stress among breast cancer survivors and reported that 40% of women experienced diet- and weight-related stressors often or very often after cancer treatment, suggesting that diet and

weight are major concerns within this growing population (21). Additional research is required to explore diet- and weight-related stressors among breast cancer survivors and to determine whether prevalence of diet- and weight-related stressors differ depending on perceived diet quality. More specifically, perceived fruit and vegetable consumption and actual consumption need to be examined because discrepancies between these factors may also contribute to diet- and weight-related stress. In other words, if one perceives they are meeting diet recommendations but actually fails to meet them, this may provoke stress. Identifying relationships among these factors may aid healthcare professionals in providing breast cancer survivors with tailored care following treatment with the goal of simultaneously improving mental and physical health.

Healthcare professionals play a crucial role in cancer management. Unfortunately, it has been reported that healthcare professionals rarely provide cancer patients with nutritional recommendations (13). Given the suggestive evidence that breast cancer survivors are concerned about their diet and weight, more research is needed to explore healthcare professional involvement in providing nutritional information to breast cancer survivors after treatment in order to determine if changes in cancer care need to be made at the professional level.

The objectives of this study were: (1) to examine mean-level differences of body mass index (BMI), perceived competence in maintaining a healthy diet, value of a healthy diet, and diet- and weight-related stressors among breast cancer survivors who: (i) perceive they are meeting CFG recommendations for fruits and vegetables and actually meet them (Positive Match); (ii) perceive they are meeting CFG recommendations for fruits and vegetables but fail to meet them (Positive Mismatch); (iii) perceive they are not meeting CFG recommendations for fruits and vegetables but

actually meet them (Negative Mismatch); and (iv) perceive they are not meeting CFG recommendations for fruits and vegetables and fail to meet them (Negative Match); and (2) to describe healthcare professional involvement in providing nutritional information to breast cancer survivors and explore group differences in healthcare professional involvement between survivors who perceive they are meeting CFG recommendations and those who perceive they are not, and those who actually meet CFG recommendations and those who do not.

5.3 Methods

This study was a supplemental study to an ongoing Canadian Institute of Health Research (CIHR) funded investigation entitled "The impact of physical activity on physical and mental health among breast cancer survivors over time". The purpose of the main study was to examine the importance of lifestyle physical activity on short- and long-term physical and mental health among breast cancer survivors. This supplemental investigation added a nutrition component to the main study in order to explore knowledge of CFG recommendations, in addition to diet- and weight-related stressors, diet-related self-perceptions, and healthcare professional involvement in providing nutrition information to breast cancer survivors. The McGill University Institutional Review Board approved the study protocol.

Study Sample

Inclusion criteria were as follows: (1) female breast cancer survivors; (2) 18 years of age or older; (3) 8 to 20 weeks post treatment after a first diagnosis of breast cancer, with the exception of adjuvant hormonal therapies, (4) received chemotherapy

and/or radiotherapy, (5) diagnosed with Stage I to III breast cancer and, (6) reported no health concerns that prevented physical activity. Flyers and information cards outlining study information were placed in oncology waiting rooms of four major health centers within Montreal and surrounding areas of Quebec. Oncologists in these health centers were supportive of this investigation. Women who were interested in this study contacted the project manager to schedule an initial meeting where additional information about the study was provided to them. Women who agreed to participate in the study were asked to provide informed consent and were given a self-administered questionnaire packet to complete and mail back. The questionnaire assessed background and cancer characteristics and a series of psycho-social and physical activity questionnaires for the purpose of the physical activity study. In addition, questions assessing pre-diagnosis and current weight status, competence and value, diet- and weight-related stressors, fruit and vegetable consumption, and healthcare professional involvement were included for the purpose of this study. The personal and cancer-specific demographic data from the main study were used to describe the sample.

Measures

Demographic and Cancer Characteristics. Age, height, weight (pre-diagnosis, current), ethnicity, income, familial information, menopausal status, and cancer characteristics (stage of cancer at diagnosis, type of treatments) were assessed to describe the study population. Weight change was determined by computing the difference between self-reported pre-diagnosis weight and current weight. BMI was calculated by dividing participants' reported weight in kilograms by their squared height in meters. BMI was categorized as less than 18.5 kg/m^2 (underweight), 18.5-24.9 kg/m^2

(healthy weight), 25.0-29.9 kg/m^2 (overweight), and 30.0 kg/m^2 or higher (obese), according to the World Health Organization categories (22).

Fruit and Vegetable Intake. A 6-item food frequency questionnaire (FFQ) was used to assess usual fruit and vegetable intake. The FFQ is a modified version of an optional addition to the Rapid Risk Factor Surveillance System (23). It has been validated against three 24-hour recalls and found to be a good proxy of fruit and vegetable servings (24). Participants were asked to report how many times they consumed juice, fruit, salad, potatoes, carrots and other vegetables per day, per week, or per month. For the purpose of this study, participants were asked the open-ended question "How many daily servings of fruits and vegetables does Canada's Food Guide recommend for women your age?" The follow-up question "Based on your response, are you meeting the recommendations for fruits and vegetables?" was used to determine whether or not participants perceived they were meeting CFG recommendations for fruits and vegetables.

Participants were categorized into four groups based on whether or not they actually met CFG recommendations of 7-8 servings/day of fruits and vegetables and whether or not they perceived they were meeting recommendations: Positive Match included breast cancer survivors who perceived they were meeting CFG recommendations for fruits and vegetables and were meeting them; Positive Mismatch perceived they were meeting CFG recommendations for fruits and vegetables but failed to meet them; Negative Mismatch perceived they were not meeting CFG recommendations for fruits and vegetables but actually met them; and Negative Match

perceived they were not meeting CFG recommendations for fruits and vegetables and failed to meet them.

Diet- and Weight-related Stressors. Four diet- and weight-related stressors were assessed in this study. Two of the four stressors, overweight feelings, and concerns for making healthy dietary choices were among other emotional health stressors that had been used in a past study on active breast cancer survivors (21). Due to the lack of research assessing frequency of diet- and weight-related stressors, two additional items that were of interest to this work (i.e. concerns for meeting dietary recommendations and negative attitudes about body shape and appearance), were added to the list of stressors. These items were added to the scale based on previous qualitative research with breast cancer survivors (25-27). Preliminary analyses were conducted to demonstrate the psychometrics of these items. The negative attitudes about body shape and appearance stressor was validated with a well-known measure of negative attitudes about body shape and appearance called the Social Physique Anxiety Scale (28) – a measure included in the larger study protocol. The correlation between the negative attitudes about body shape and appearance stressor and social physique anxiety was $r=0.65$, $p<0.001$, suggesting that this stressor is related to measures of negative attitudes about body and appearance. The two items for diet stress were correlated at 0.72. The two items assessing weight-related stress were correlated at 0.78.

Participants were asked to indicate how often they experienced each stressor (negative attitudes about their body shape and appearance, feeling overweight, concerns for making healthy dietary choices, concerns for meeting dietary recommendations), on

a 5-point Likert scale(1=not at all; 5=very often). Mean stressor scores were derived for weight-related stressors and diet-related stressors independently.

In addition to the four diet- and weight-related stressors assessed, participants were given the option of listing additional diet- and weight-related stressors that they experienced that were not listed in the questionnaire. The open-ended questions were not used in the current study because not all women had scores for these open-ended stressors.

Perceived Diet Competence and Value of Healthy Diet. One item from the Perceived Competence Scale for Healthy Eating was used to assess participants' confidence in their ability to maintain a healthy diet (29). Participants were asked to rank the statement "I feel confident in my ability to maintain a healthy diet" on a 5-point Likert Scale (ranging from 1 = not at all true to 5 = very true). Value of healthy diet was assessed using two items from the Self- and Task-Perception Questionnaire, modified to a diet context (30,31). Participants were asked to rank on a 5-point Likert Scale "How important is eating a healthy diet?" and "How valuable do you find eating a healthy diet?", with responses ranging from 1=not at all important/valuable to 5=very important/valuable. The value and importance items from the modified Self- and Task-Perception Questionnaire were grouped together to compute a mean Diet Value Score, and the competence item was used as a Perceived Diet Competence Score.

Healthcare Professional Involvement. Participants were asked to select from a list of possible sources where they received the majority of their nutritional information. The list included: family, friends, other cancer survivors, healthcare professionals, books,

pamphlets, Internet, and other. Participants had the option to select more than one source from the list. If participants selected "other", they were asked to list these other sources. Additional questions specific to healthcare professionals were included whereby participants were asked which healthcare professionals provided them with nutritional information. Participants were again asked to select from a list of healthcare professionals, with the option of selecting more than one and an open ended selection where they could list any other healthcare professionals who provided them with nutrition information that were not on the list. The list included: physician, dietitian, nurse practitioner, psychologist, physical therapist, and other. Participants were also asked to list and/or select possible ways in which nutritional information was provided (books, pamphlets, face-to-face counselling, and other).

Statistical Methods

Descriptive statistics (means, standard deviations, percentages) were used to describe the study sample in terms of fruit and vegetable consumption, pre- and post-diagnosis weight, BMI, perceptions of diet competence and value, diet-stressors, weight-stressors, and healthcare professional involvement. Pearson correlation coefficients were computed to examine associations among BMI, perceived diet competence score, diet value score, and mean diet and weight stressor scores. Chi-square (χ^2) was used to compare the proportion of breast cancer survivors in each of the four comparison groups and a Kappa Agreement test was run to determine the percent agreement between perceptions of meeting, and actually meeting CFG recommendations.

To examine mean score differences between the four groups on measures of BMI, perceived diet competence, diet value, and diet and weight-related stressors, a multivariate analysis of variance (MANOVA) was conducted with a follow-up univariate analysis of variance (ANOVA) and Tukey's post-hoc tests to examine significant differences. Descriptive statistics (i.e. percentages) were used to describe healthcare professional involvement and χ^2 was used to compare the proportions of women reporting healthcare professional involvement in nutrition care across each of the groups. Statistical analyses were done using SPSS Statistics 18 (32). Alpha was set at $p<0.05$.

5.4 Results

Preliminary Analyses

Descriptive Characteristics. Eighty-six percent of participants were Caucasian. Sixty-six percent of the women were married or living with a partner, and 72.8% had children. Furthermore, 94% of participants reported having at least a high-school diploma and 63.1% reported being post-menopausal. These data can be seen in Table 1.

Total fruit and vegetable servings were computed to represent daily servings. On average, the women consumed 6.0 servings of fruits and vegetables per day (range= 0 to 13.5 servings/day). Those whose daily servings added up to seven or more servings per day were classified as meeting recommendations as were participants who consumed between 6.5 and 7.0 servings per day.

Half of participants (50%) were overweight or obese based on having a BMI of greater than 25 kg/m^2. Furthermore, 42% of participants gained weight since cancer

diagnosis (mean weight gain=4.2 kg), 37.9% of participants lost weight (mean weight loss=3.5 kg), and 16.6% had no weight change.

Concerns for meeting dietary recommendations, and concerns for making healthy dietary choices were experienced "often" or "very often" (a score of 4 out of 5 or greater) by 65% of breast cancer survivors. Twenty-four percent of participants reported weight-stressors (i.e. feeling overweight, negative attitudes about body shape and appearance) "often" or "very often". Approximately 33% of participants listed at least one additional stressor. Other diet-related stressors listed by participants included: concerns regarding phytoestrogens, carcinogens found in food, financial ability for a healthy diet, and confusion regarding soy food products. Other weight-related stressors included: attaining a goal weight, changes in body composition resulting from cancer treatment, and fear of gaining weight during treatments.

Weight-stressor score was significantly positively associated with BMI and diet-stressor score, and significantly negatively correlated with perceived diet competence. Diet-stressor score was significantly positively associated with weight-stressor score, perceived diet competence and diet value. Pearson correlation coefficients are presented in Table 2.

Canada's Food Guide Recommendations

Descriptively, the majority of participants (66.3%) were not meeting CFG recommendations, and 55% of those not meeting recommendations perceived that they were. The comparison of proportions of survivors in each group showed that 24% of participants were categorized in the Positive Match group, followed by 36% in Positive Mismatch, 10% in Negative Mismatch, and 30% in Negative Match (χ^2=3.88; p=0.05).

Furthermore, there was poor agreement between the participants' perceptions of meeting CFG recommendations and whether or not they actually met them (Kappa=0.13). When asked what the fruit and vegetable guidelines were, the most recurrent response was five servings per day, followed by seven to eight servings per day (Figure 1). In addition, after categorizing the participants into the four discrepancy groups, descriptive statistics showed that 30.8% of survivors in the Positive Match group correctly identified the fruit and vegetable guidelines, compared to 24.6% of the Positive Mismatch group, 29.4% of the Negative Mismatch group, and 38.5% of the Negative Match group.

BMI, perceived diet competence, diet value, and diet- and weight-related stressors

In support of the first research objective, the overall MANOVA comparing the four groups on the basis of BMI, perceived diet competence, diet value, and diet- and weight-related stressors was significant, Pilai's Trace = 0.25, F (3,161) = 2.93, $p <$ 0.001. Follow-up univariate analyses showed no significant differences among the groups for BMI ($p = 0.26$), diet-related stressors *(*$p = 0.84$*)* and weight-related stressors *(*$p = 0.27$). The univariate model was significant for perceived diet competence, F (3,165) = 9.02, $p < 0.001$ and perceptions of diet value F (3,165) = 5.12, $p = <0.01$. Tukey's post-hoc analysis revealed that women in the Negative Match group had significantly lower perceived diet competence than those in the Positive Match group and Positive Mismatch group ($p<0.001$*)*. Furthermore, those in the Positive Match group placed more value and importance on healthy eating than those in the Negative

Mismatch and Negative Match groups (p <0.05*)*. Results of the MANOVA are presented in Table 3[1].

In order to examine perceptions of meeting CFG recommendations specifically, the groups were further collapsed into two groups (Perceived Meeting and Perceived Not Meeting CFG recommendations) and compared on the basis of the study variables. The two groups differed significantly with regards to perceived competence in maintaining a healthy diet, Pilai's Trace = 0.17, F (1,167) = 25.40, p < 0.001, and value placed on a healthy diet, F (1,167) = 12.21, p = 0.001; however groups did not differ significantly with regards to BMI or mean scores of diet-stressors and weight-stressors.

Healthcare professional involvement

Forty-three percent of breast cancer survivors reported that no healthcare professional had provided them with dietary recommendations or information. Of those who reported that a healthcare professional had provided them with any nutritional information, 18.5% reported that a physician provided them with information, and 34.5% reported that a dietitian had provided them with information, as displayed in Figure 2. Of the 57% who reported receiving information from a healthcare professional, 73% reported receiving face-to-face counselling. In addition, 74% of survivors reported receiving additional information from books/pamphlets, as presented in Figure 3.

[1] Potential confounding variables that were assessed as part of the larger study (physical activity, stage of cancer at diagnosis, breast cancer treatment) were assessed for possible relationships with the study variables (BMI, diet value, perceived diet competence, stressors). None of these variables were significantly associated with the study variables and were not included in the final analyses in order to present the most parsimonious model.

The χ^2 analyses showed no significant differences in the percentage of women who perceived they were meeting recommendations compared to those who perceived they were not meeting recommendations with regards to reported healthcare professional involvement in providing nutritional information (χ^2=0.82, p=0.36). Similarly, no significant difference was observed between those actually meeting recommendations and those not meeting recommendations in terms of healthcare professional involvement (χ^2=0.11, p=0.74).

5.5 Discussion

The psychological health and well-being of cancer survivors is an emerging and increasingly important field of research (33,34). In addition, past research suggests that fruits and vegetables may play a protective role in cancer risk; making them a topic of interest within the cancer population (35,36). To our knowledge, this was the first investigation to examine diet- and weight-related stressors in relation to fruit and vegetable consumption and knowledge of CFG recommendations in a breast cancer survivor population, as well as perceived competence and value in a diet context among cancer survivors. Our findings suggest that breast cancer survivors are very concerned about healthy eating, with over 60% experiencing diet-related stressors often or very often. However these diet-related concerns are not associated with perceptions of meeting, or actually meeting, Canada's Food Guide recommendations for fruits and vegetables. These concerns may be due to a number of other underlying factors, including an overall confusion concerning what the dietary recommendations are (13). Further research is required to examine these factors in order to determine whether

changes at the healthcare level, as well as nutrition information using consistent and reliable dietary recommendations has an effect on diet-related concerns among breast cancer survivors.

Women between the ages of 19 and 50 years old are advised to consume at least 7-8 servings of vegetables and fruits every day, and women 51 years of age or older are advised to consume at least 7 servings per day (17). This study found breast cancer survivors are not aware of CFG recommendations, with only 31% correctly identifying fruit and vegetable recommendations. These findings suggest that there is a large gap in knowledge of dietary guidelines. Due to the number of mediums that are used to disseminate information (i.e. television, radio, Internet, books, etc.), it is difficult to ensure that breast cancer survivors are receiving/accessing reliable information. For example, unlike the CFG recommendations, the Canadian Cancer Society and the American Cancer Society suggest that men and women consume at least five servings of fruits and vegetables everyday to prevent cancer (17, 37,38). While these guidelines are not specific to cancer survivors, it is likely that guidelines supported by cancer agencies – regardless of their target audience – will be of more interest to women who have been diagnosed and treated for breast cancer. The differences in the available guidelines may account for some of the discrepancies in knowledge of the guidelines observed in this study population. Canada's Food Guide is an excellent educational tool, as its complex development was based on diets comprised of foods eaten most often by Canadians. These diets were assessed relative to Dietary Reference Intakes (DRI) to ensure that the micronutrient recommendations are met. The food guide provides recommendations that promote a balanced diet that meets nutritional needs and promotes health (39). As breast cancer survivors begin to make lifestyle changes after diagnosis, it is crucial that

healthcare professionals provide them with reliable, easily accessible nutrition tools such as CFG with which they can make healthy dietary choices that result in a well-balanced diet and healthy weight.

This study also found that breast cancer survivors who perceived they met, and actually met CFG recommendations were both more confident in their ability to maintain a healthy diet and placed more value on healthy eating compared to those who perceived they were not meeting, and failed to meet recommendations. These findings support past research that suggests the importance of value and competence on health promotion behaviours (19,20,30). If value and competence are both predictors of successful behaviour change, health promotion practices during and after treatment should be geared towards educating breast cancer survivors on the value of healthy practices such as nutrition, and helping them increase their confidence in their ability to manage their diet after cancer treatment. Health professionals can play a key role in informing cancer survivors of the importance of a healthy diet and maintaining a healthy weight.

Understanding the risks of an unhealthy diet may not translate into behaviour change immediately, but rather contribute to diet-related stress if survivors perceive their diet is unhealthy. Our study showed no significant differences in mean diet- and weight-related stressor scores across comparison groups. This may be due to a number of different factors. For instance, diet-related stressors may not be associated with fruit and vegetable consumption, but rather with other unhealthy eating behaviours, such as diets high in fat, that were not examined within this study. In addition, it might be argued that breast cancer survivors who were meeting recommendations and/or perceived they were meeting recommendations were experiencing diet- and weight-

related stressors, and these concerns were thus leading them to make positive changes to their diet and therefore meet dietary recommendations. In contrast, diet- and weight-related stressors may have been the outcome of perceiving that dietary guidelines were not being met. Although there were no differences across the groups with regards to how often diet- and weight-related stressors were experienced, the fact that all groups were experiencing these stressors is an indication that more needs to be done from a professional standpoint to help breast cancer survivors cope with these concerns and help make positive behavioural changes.

To our knowledge, this was the first study to examine healthcare professional involvement in providing dietary information to breast cancer survivors following treatment. This investigation showed that breast cancer survivors who receive nutrition information from a healthcare professional will most likely get this information from a dietitian (Figure 2). However, our study found that over 60% of survivors are concerned about their diets and 50% are overweight or obese. These findings suggest that healthcare professionals, especially dietitians, may need to modify their health promotion strategies in order to ensure that these diet-related concerns and overweight status are addressed during and after cancer treatment. More specifically, a multidisciplinary healthcare team should work on preventive health practices that focus on weight management strategies, patient-centered approaches to limiting the occurrence of diet-related stressors, educating survivors on the value of healthy eating, and educating breast cancer survivors on healthy dietary practices using consistent, reliable tools such as CFG. With the help of a multidisciplinary healthcare team, breast cancer survivors may achieve a healthy body weight through healthy eating and

exercise, feel confident in their abilities to take control and manage their disease after completing treatment, and hopefully increase their chances of survival.

Strengths and Limitations

This study provided a unique perspective on dietary practices of breast cancer survivors. Categorizing breast cancer survivors based on the discrepancy between those who perceive they are meeting guidelines and those who actually meet guidelines provided a novel way of examining this growing population. To our knowledge, this study was the first to examine breast cancer survivors' knowledge of CFG recommendations in relation to diet- and weight-related stressors as well as healthcare professional involvement in providing nutritional information.

We acknowledge that this study also had some limitations that must be considered when interpreting the results. First, due to the cross-sectional design of the study, we were unable to determine if breast cancer survivors were meeting CFG recommendations before or after cancer diagnosis in order to determine if current intake was a result of cancer diagnosis. In addition, participants willingly participated in the study and may have been more health conscious and more motivated to pursue lifestyle changes than those who chose not to participate; thus limiting the generalizability of the results. Furthermore, although the FFQ used to asses fruit and vegetable intake was validated, the questionnaire used to assess whether survivors perceived they were meeting CFG recommendations or not was self-developed for the purpose of this study. Also, individual items were taken from the Perceived Competence Scale for Healthy Eating and the Self- and Task-Perception Questionnaires. Out of context, these items might not have been as significant as they would have been if used as part of their

respective scales as a whole. Despite these limitations, the results from this study can be used to help healthcare professionals better understand this population of cancer survivors and in turn individualize care after cancer treatment. By understanding the diet-related concerns of breast cancer survivors and their perceptions of their diet, dietitians can work to provide patients with personalized healthy eating strategies to help them achieve or maintain a healthy diet, and aid in weight loss and reduced diet- and weight-related stress over time.

5.6 Conclusion

This study provides new details about nutritional knowledge of breast cancer survivors, diet value and competence, common stressors experienced, and healthcare professional involvement in breast cancer care. The findings suggest that although a large proportion of breast cancer survivors often experience diet-related stressors following cancer treatment, the discrepancy between perception of meeting recommendations and actually meeting recommendations has no significant effect on frequency of diet- and weight-related stressors. However, perception of meeting recommendations is associated with higher perceived competence in maintaining a healthy diet and higher value in healthy eating. Future studies should continue to fill the gap in nutrition literature within the cancer population by examining whether the involvement of dietitians during and after treatment may improve perceived competence in maintaining a healthy diet, and further educate cancer survivors on the value of healthy eating.

Cancer diagnosis has been described as a teachable moment, an opportunity for healthcare professionals to promote healthy lifestyle behaviours (40). Healthcare

professionals need to improve their health promotion strategies as early as possible in order to aid in weight management and in the prevention of unhealthy dietary practices throughout survivorship. With the right support and educational tools, survivors may have a greater chance at leading a healthier life, and subsequently decreasing their risk of cancer recurrence.

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5.8 - Tables

Table 1.
Descriptive characteristics of breast cancer survivors.

Characteristic (n=169)	Mean ± standard deviation	
Age (years)	54.4 ± 10.8	
Height (cm)	161.8 ± 7.3	
Weight (kg)	68.1 ± 14.2	
BMI (kg/m^2)	26.1 ±5.5	
Fruit & Vegetable Intake (servings/day)	6.0 ± 2.1	
Waist Circumference (cm)	89.7 ±14.9	
Diet Stressor Score (out of 5)	3.9±1.0	
Weight Stressor Score (out of 5)	2.8±1.1	
Perceived Diet Competence Score (out of 5)	4.0±0.8	
Diet Value Score (out of 5)	4.6±0.5	
	N	**%**
Vitamin Supplementation	116	69
Ethnicity		
Caucasian	146	86.2
Other	23	13.8
Income		
$0 to $30,000	18	13.1
$30,001 to $60,000	46	33.6
60,001 to 90,000	26	19.0
90,001 to 120,000	22	16.1
Over 120,000	25	18.2
Did not answer	32	
Highest Level of Education		
Did not complete high school	10	6.0
High school diploma	21	12.5
Some post-secondary; did not complete diploma or degree	16	9.5
College or tech diploma or certificate	36	21.4

University undergraduate degree	50	29.8
Post-graduate degree	35	20.8
Did not answer	1	
Marital Status		
Married or living with partner	111	66.1
Single	20	11.9
Separated	3	1.8
Divorced	24	14.3
Widowed	10	6.0
Did not answer	1	
Menopausal Status		
Pre-menopausal	28	17.5
Peri-menopausal	31	19.4
Post-menopausal	101	63.1
Children		
Have children	123	72.8
No children	46	27.2
Cancer Characteristics		
Chemotherapy	113	67.3
Radiotherapy	139	82.7
Hormonal Therapy	92	54.8

Table 2.
Pearson correlations among BMI[†], perceived diet competence, diet value, diet stressors and weight stressors among breast cancer survivors (N = 169).

	BMI	Perceived Diet Competence	Diet Value	Diet Stressors	Weight Stressors
BMI	-				
Perceived Diet Competence	0.31**	-			
Diet Value	-0.17*	0.37**	-		
Diet Stressors	0.01	0.18*	0.31**	-	
Weight Stressors	0.50**	-0.23**	-0.07	0.24**	-

p<0.05
****p<0.01***
[†]**BMI – Body Mass Index (Weight in kilograms)/ (Height in meters)^2**

Table 3.
Mean group comparisons of BMI*, perceived diet competence, diet value and diet- and weight-related stressors among breast cancer survivors

	Group 1: POSITIVE MATCH (n= 40)	Group 2: POSITIVE MISMATCH (n= 61)	Group3: NEGATIVE MISMATCH (n=17)	Group 4: NEGATIVE MATCH (n=51)	F	n
BMI	25.0	26.1	28.2	26.5	1.33	169
Perceived Diet Competence	4.2	4.3	4.0	3.6†	9.02**	169
Diet Value	4.9‡	4.7	4.4	4.5	5.12**	169
Diet-Stressor Score	4.0	3.9	4.1	3.9	0.28	169
Weight-Stressor Score	2.5	2.8	3.1	2.9	1.36	169

***BMI – Body Mass Index (Weight in kilograms)/ (Height in meters)^2**
****p<0.01**
†Negative Match group had statistically lower perceived diet competence compared to Positive Match and Positive Mismatch Groups (p<0.05)
‡Positive Match group had statistically higher diet value compared to Negative Mismatch and Negative Match groups (p<0.05)

5.9 - Figures

Figure 1 – Breast Cancer Survivors' Knowledge of Canada's Food Guide Recommendations for Fruits and Vegetables (n=169)

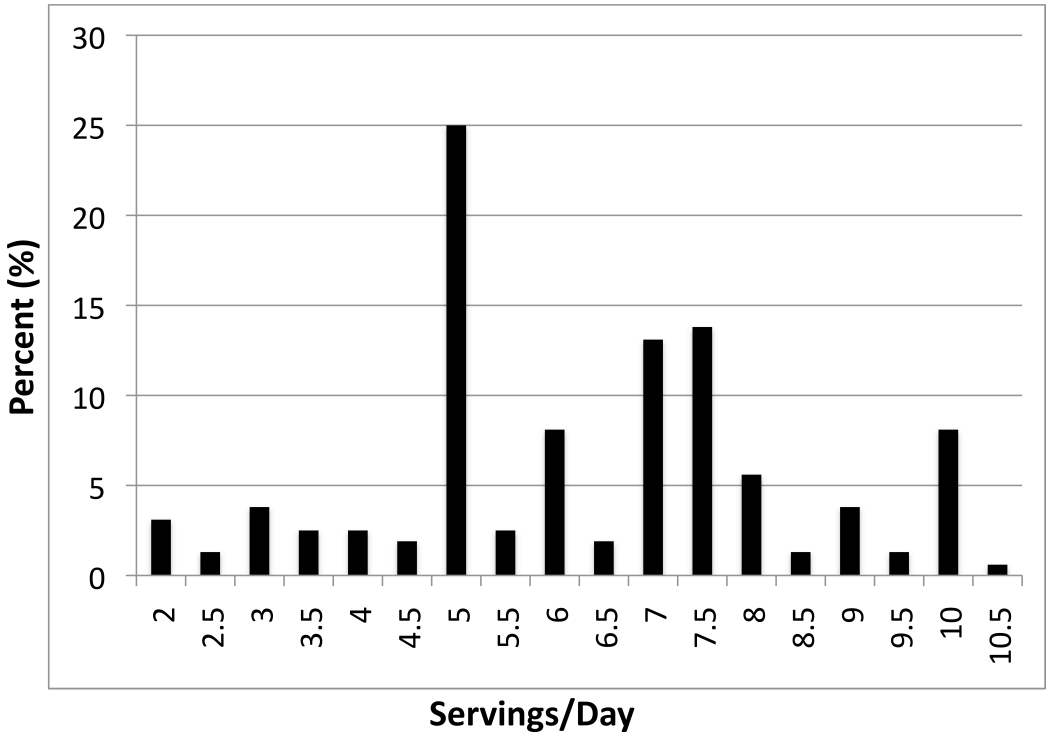


Figure 2 – Healthcare Professional Involvement in Providing Nutritional Information to Breast Cancer Survivors (n=169)

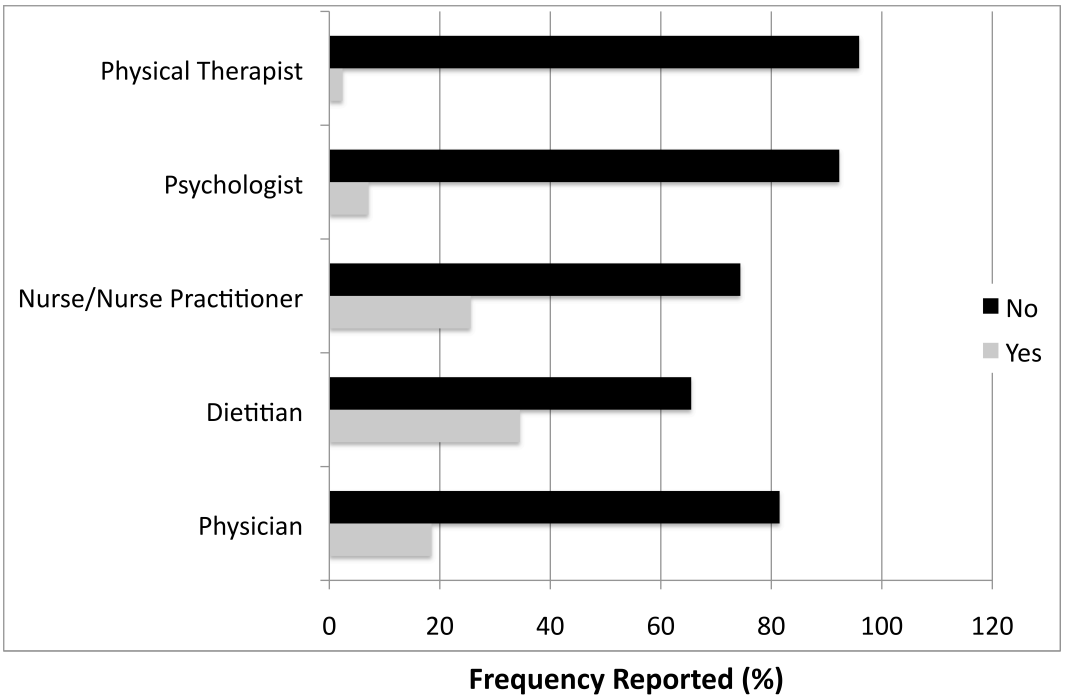
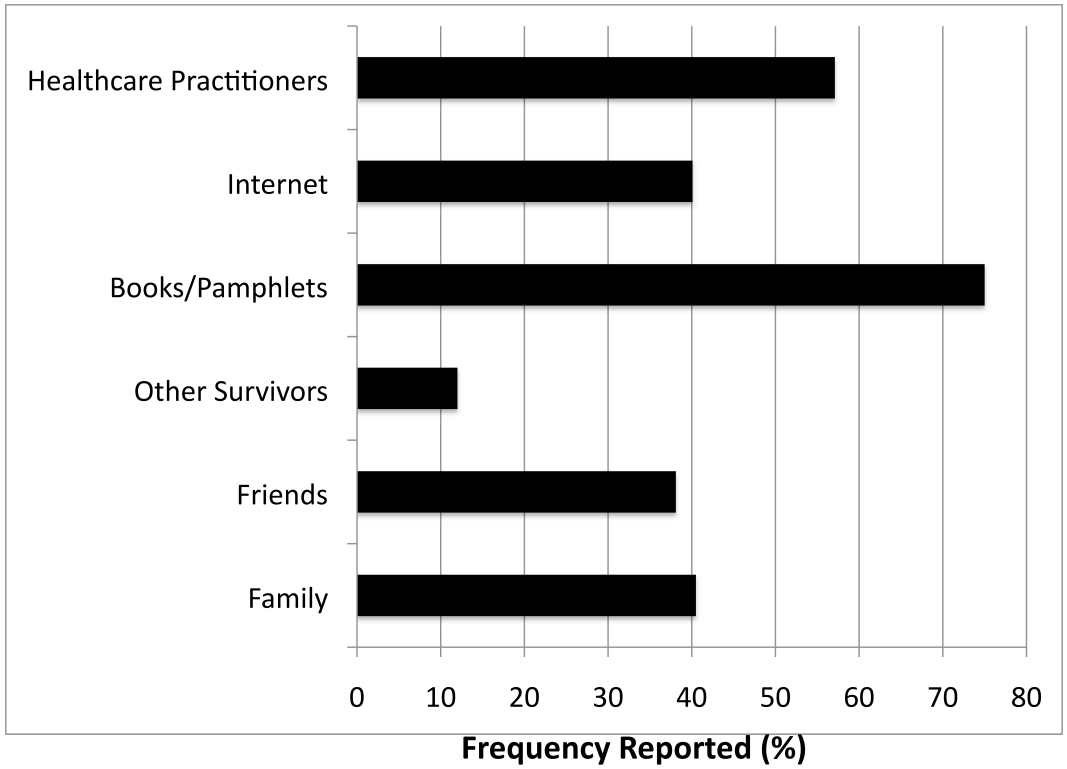


Figure 3 – Sources of Nutritional Information for Breast Cancer Survivors (n=169)



6.0 CONCLUDING STATEMENT

This research provides relevant information on breast cancer survivors that can be used to understand this growing population for future health promotion strategies. The findings from this study suggest that many breast cancer survivors are struggling with their diet and weight. Half of our study population was overweight or obese, and 66% were not meeting Canada's Food Guide recommendations for fruits and vegetables. Furthermore, diet-related stressors were experienced often or very often by the majority of breast cancer survivors. Despite the frequency of diet-related stressors, only 30% of breast cancer survivors were aware of Canada's Food Guide recommendations for fruits and vegetables, and a large proportion of breast cancer survivors (36%) perceived they were meeting guidelines but actually were not. These alarming findings highlight the need for a more diet-centered approach to cancer care for breast cancer survivors who have recently completed treatment. Due to the suggestive evidence that diet and weight play a role in cancer survival, the inclusion of dietitians in the multidisciplinary healthcare team is critical as they are the most educated in nutrition and can provide breast cancer survivors with the necessary tools and information with which to improve their diet, and maintain a healthy weight.

Examining diet, weight, perceived diet competence and value, and stressors in relation to the discrepancy between perception of meeting, and actually meeting fruit and vegetable guidelines was a unique way of combining the mental and physical changes that are experienced after cancer diagnosis. To our knowledge, this was the first study to group breast cancer survivors in a way that took into account both perception of meeting dietary guidelines and actually meeting guidelines. Although we did not find

that the groups differed significantly with regards to BMI, diet stressors or weights stressors, our findings were useful in that on average all groups experienced diet-related stressors often, and the groups did differ significantly in terms of diet value and perceived competence in maintaining a healthy diet. This suggests that diet, independent of self-perception of meeting guidelines, is concerning and may be contributing to overall stress of breast cancer survivors, and that value and competence are related to perceptions of meeting guidelines. These findings can be used at the clinical level to aid in developing health promotion strategies that involve diet education at an early stage for cancer patients. Perhaps more knowledge of the guidelines can result in healthy dietary changes as well as increased confidence in ability to manage health.

Fruit and vegetable consumption was the focus of this research; however there is more to healthy eating than simply the addition of fruits and vegetables. Perception of overall diet quality may contribute to diet- and weight-related stress more than perception of meeting fruit and vegetable recommendations. Exploring other aspects of the diet using food records or diet recalls and more comprehensive nutrient analyses may provide a more detailed picture of the diet quality of breast cancer survivors and may in turn yield different results on the relationship between diet and stress.

Due to the novelty of this research design, future studies must build on the methods used within this study to produce additional findings that hopefully support the need for nutrition education and weight management after cancer treatment. Future research needs to examine these issues in a longitudinal study design in order to determine whether perceived diet quality and weight status change over the course of survivorship. In addition, controlled studies should be done to determine whether interventions after treatment can improve weight status and diet quality, and prevent

diet- and weight-related stressors, and whether these factors are associated with survival. Future studies should also explore the issue of healthcare professional involvement in more detail, and perhaps examine whether healthcare professionals are aware of the concerns of breast cancer survivors. Ultimately, changes need to be made at a professional level; dietitians may need to play a larger role in nutrition education and weight management after treatment and the multidisciplinary healthcare team must be aware of the concerns of breast cancer survivors in order to provide effective patient-centered care.

To our knowledge, this study was the first to explore self-perception relative to nutrition. Our findings did not support our hypothesis that women who perceived they were meeting guidelines would report experiencing diet- and weight-related stressors less often than those who perceived they were not meeting guidelines. The measures used to evaluate perception were self-developed due to the originality of the study objectives. Future studies should also look into the notion of self-perception within this population by modifying measures of self-perception used in the past and tailoring them to the diet. Pre-existing measures validated in other populations could also increase the validity of future studies.

Diet, weight and stress are major issues that need to be explored within this population and more needs to be done at both the research and clinical levels to help maximize the physical and mental health of these women. The question still remains whether increases in fruits and vegetables and maintaining a healthy weight reduce the risk of cancer recurrence; however as shown in the literature review, studies have found that obesity can reduce the risk of cancer survival and fruit and vegetable intake may also reduce the risk of cancer recurrence. It is therefore critical that healthcare

professionals intervene at an early stage to ensure that breast cancer survivors have the tools and knowledge they need to make healthy lifestyle changes that result in healthy weight status and a balanced diet in order to hopefully maintain a healthy weight and improve their chances of survival.

Overall, this research provided important information which can help improve the health and well-being of breast cancer survivors. The findings from this study are a strong foundation on which future studies can build. At the clinical level, healthcare professionals need to take advantage of this "teachable moment" and apply the information they know about this population to develop realistic and effective health promotion strategies that breast cancer survivors can use throughout survivorship.

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8.0 APPENDICES

Appendix A

Department of Kinesiology Physical Education
475 Pine Avenue West
Montreal, Quebec
H2W 1S4
Phone: 514-398-4184

CONSENT FORM

Project funded by:	The Canadian Institutes of Health Research & Canadian Breast Cancer Research Alliance
Title of research project:	The impact of physical activity on physical and mental health among breast cancer survivors over time.
Principle investigator:	Catherine M. Sabiston, Ph.D., McGill University
Co-investigators:	Carsten Wrosch, Ph.D., Concordia University; Jennifer O'Loughlin, Ph.D., L'Université de Montréal (CHUM)

Purpose:
The purpose of this study is to examine the importance of lifestyle physical activity on short- and long-term physical and mental health among breast cancer survivors. We are asking for your participation in this research so that we can better understand emotional and physical health over time, following your treatment for breast cancer. Results from this study will be presented at scientific conferences, will be published in academic journals, and will be widely distributed for health promotion efforts.

Study Procedures:
You will be asked to complete six questionnaires over the next 18 months. The survey takes approximately 30 minutes to complete, and is available in paper/pencil format or an electronic copy can be mailed to you. On six occasions in the next 18 months, you will also be asked to wear an accelerometer (a small device that goes on your waist and tracks your physical activity levels) for seven days, to collect saliva samples on a small gauze pad on three non-consecutive days as you go about your regular routines, and to provide a blood sample (via a finger prick). You will be asked to come to the McGill University exercise psychology laboratory for baseline measures and final assessments (heart rate and blood pressure). Alternatively, we can meet you at your home for the baseline measures. We will mail you the remaining kits for collection during the 18 month period. You may also be asked to wear a pedometer at least 3 days a week throughout the study.

Benefits to Participants:
There may or may not be a direct medical benefit to you for taking part in this study; however, the overall impact for the breast cancer survivor community's physical and mental health will be significant.

Risks to Participants:
There are no foreseeable risks associated with your involvement in this study.

Compensation:
You will receive a total of $150.00 over the course of the study. This compensation is based on providing you with $25.00 per assessment session (6 times in 18 months). Additionally, you will be reimbursed for parking/transportation expenses while at McGill University for the baseline and final measures.

Confidentiality:
Information gathered during this study will be used for research purposes only (i.e., preparation of academic research publications and presentations). A number of precautions will be taken to guarantee the confidentiality of the information that you will provide. Results from this study will be analyzed in group form and participants from this study will be identified as 'women who have been treated for breast cancer'. Furthermore, in all databases and documentation, participants will be identified by unique identification number only. The Institutional Review Board of the Faculty of Medicine may access the study data to ensure proper data management and to verify the ethical conduct of the study. No additional persons other than the members of the research team will have access to the completed questionnaires, or any other supporting documentation, which will be securely stored for five years as required by McGill University. After this time, the principal investigator will destroy all related study documents.

Participants concerns:
- Your participation in this study is voluntary. Also, you will be advised of any new information that may influence your decision to participate in this study.
- If you decide not to take part, you will not lose any health care benefits or services to which you are otherwise entitled.
- If you decide to participate in this study, you may refuse to answer any questions you are uncomfortable with or withdraw from this study at any time. By signing this consent form to participate in this study, you do not waive any legal rights.
- There are no known conflicts of interest on the part of the researchers or McGill University.

Contact information about your rights as a participant in this study:
If you have any questions about the treatment or rights of research participants, you may anonymously contact the Senior Ethics Administrator, Ilde Lepore, at 514-398-8302.
Contact information about the study:
If you have any questions concerning the procedures of this study, you may anonymously contact Sylvie Moisan (project manager) at 398-4184 ext: 0481.

McGill

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475 Pine Avenue West
Montreal, Quebec
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Phone: 514-398-4184

PARTICIPANT CONSENT FORM

Title of research project:
The impact of physical activity on physical and mental health among breast cancer survivors over time.

This study has been explained to me and I accept the terms of this study. I have had an opportunity to ask questions and my questions have been answered to my satisfaction. I have been informed that I may refuse to participate or withdraw at any time without any loss of health care benefits to which I am otherwise entitled. I voluntarily agree to participate in this study, which involves the pre-determined completion of 6 questionnaires, the collection of saliva on 3 non-consecutive days, a small finger prick to collect one drop of blood onto a sterile pad, and the wearing of an accelerometer for a 7-day period at 6 points in time during the next 18 months, and wearing a pedometer throughout the duration of the study. I have signed and received a copy of this form for my records.

Date	Participants signature	Printed name
Date	Investigator/Co-investigator's signature	Printed name

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Department of Kinesiology Physical Education
475 Pine Avenue West
Montreal, Quebec
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Phone: 514-398-4184

PARTICIPANT CONSENT FORM (COPY)

Title of research project:
The impact of physical activity on physical and mental health among breast cancer survivors over time.

This study has been explained to me and I accept the terms of this study. I have had an opportunity to ask questions and my questions have been answered to my satisfaction. I have been informed that I may refuse to participate or withdraw at any time without any loss of health care benefits to which I am otherwise entitled. I voluntarily agree to participate in this study, which involves the pre-determined completion of 6 questionnaires, the collection of saliva on 3 non-consecutive days, a small finger prick to collect one drop of blood onto a sterile pad, and the wearing of an accelerometer for a 7-day period at 6 points in time during the next 18 months, and wearing a pedometer throughout the duration of the study. I have signed and received a copy of this form for my records.

_____	_____	_____
Date	Participants signature	Printed name

_____	_____	_____
Date	Investigator/Co-investigator's signature	Printed name

Appendix B

McGill

Département de kinésiologie et d'éducation physique
475, avenue des Pins Ouest
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FORMULAIRE DE CONSENTEMENT ÉCLAIRÉ

Projet appuyé par: Instituts de recherche en santé du Canada et l'Alliance canadienne pour la recherche sur le cancer du sein

Titre du projet: L'impact de l'activité physique sur la santé physique et mentale chez les survivantes du cancer du sein au cours du temps.

Investigatrice principale: Catherine M. Sabiston, Ph.D., Université McGill

Co-investigateur: Carsten Wrosch, Ph.D., Université Concordia
Co-investigatrice: Jennifer O'Loughlin, Ph. D., Université de Montréal (CHUM)

But :
Le but de ce projet de recherche est d'étudier l'importance d'un mode de vie basé sur l'activité physique en fonction des indicateurs de qualité de vie subjective, à court et à moyen terme; des marqueurs biologiques du stress et; de la santé physique chez des survivantes du cancer du sein ayant un excès de poids. Nous vous demandons de participer à cette étude afin de mieux comprendre la santé émotionnelle et physique au cours du temps à la suite de votre traitement pour le cancer du sein.

Structure de l'étude :
Vous serez appelée à remplir six (6) questionnaires au cours des 18 prochains mois. Le sondage prend approximativement 30 minutes à compléter et est offert, à votre choix, soit sous la forme papier et crayon ou en ligne. Vous serez également appelée: six fois au cours des 18 prochains mois, à porter un accéléromètre (un petit appareil qui se porte à la taille et qui enregistre votre niveau d'activité physique),et ce, pour une durée de sept (7) jours; à fournir des échantillons de salive sur un petit tampon de gaze lors de trois (3) jours non consécutifs au cours de votre séance d'exercice régulière et; à fournir un échantillon de sang (par prélèvement au bout du doigt). Vous serez demandée de vous présenter au laboratoire de psychologie de l'exercice de l'Université McGill, ou à un endroit de votre choix pour les mesures de départ et pour l'évaluation finale (fréquence cardiaque et pression artérielle) et nous vous ferons parvenir par courrier le nécessaire de collecte pour la période de 18 mois. Vous serez aussi appelée à porter un podomètre pour la plupart des jours tout au long de la période de 18 mois.

Avantages pour les participantes :

Il est peu probable que vous retirerez des avantages directs de votre participation. Par contre, vous augmenterez vos connaissances des stratégies liées à un mode de vie basé sur l'activité physique et aurez une meilleure perception de votre condition physique actuelle.

Risques pour les participantes:
Il n'y a aucun risque connu associé à votre participation à cette étude.

Compensation :
Au cours de l'étude, vous recevrez un montant total de 150,00 $. Cette compensation est répartie de façon à ce que vous receviez 25,00 $ par période d'évaluation (6 fois en 18 mois). De plus, vous serez remboursées pour vos dépenses associées au stationnement ou au transport lors de vos déplacements à l'Université McGill pour les périodes de mesures de départ et pour l'évaluation finale.

Confidentialité:
L'information compilée au cours de cette étude sera utilisée à des fins de recherche seulement (c.-à-d. en préparation à la publication universitaire et aux présentations de la recherche universitaire). Un bon nombre de mesures de sécurité seront prises afin de garantir la confidentialité de l'information que vous allez fournir. Les résultats de cette étude seront analysés sous forme agrégée et les participantes de cette étude seront identifiées sous l'appellation : « femmes qui ont reçu des traitements pour le cancer du sein ». De plus, dans toutes les bases de données et dans la documentation, les participantes seront seulement identifiées par un numéro d'identification unique. Le Comité d'éthique médical de la Faculté de médecine pourrait accéder aux données de l'étude afin d'assurer une gestion adéquate des données et pour vérifier l'éthique de l'étude. Nul autre que les membres de l'équipe de recherche n'aura accès aux questionnaires complétés, ni à tout autre document associé à l'étude, qui seront archivés d'une façon sécuritaire pour une durée de cinq ans, comme prescrit par l'Université McGill. Après ce temps, l'investigatrice principale détruira tous les documents reliés à l'étude.

Les résultats de cette étude seront présentés lors de conférences scientifiques, seront publiés dans des journaux universitaires, et seront largement distribués à des fins d'efforts de promotion de la santé.

À l'attention des participantes :

- Votre participation à cette étude est volontaire. De plus, vous serez avisée de tout nouveau renseignement qui pourrait influencer votre décision à participer à cette étude.
- Si vous décidez de ne pas participer, vous ne perdrez aucun de vos avantages de prestation pour soin de santé auxquels vous auriez droit en d'autres circonstances.
- Si vous décidez de participer à cette étude, vous pouvez refuser de répondre à toutes questions pour lesquelles vous n'êtes pas à l'aise ou encore vous pouvez vous retirer de l'étude en tout temps. En signant ce formulaire de consentement

éclairé, pour votre participation à cette étude, vous ne renoncez en rien à vos droits légaux.

- Il n'existe aucun conflit d'intérêts connu de la part des chercheurs ni de l'Université McGill.

Coordonnées pour les renseignements sur vos droits en tant que participante dans cette étude:
Pour toutes questions ou inquiétudes au sujet du traitement ou des droits des participantes de l'étude, vous pouvez communiquer d'une façon anonyme avec l'administratrice d'éthique principale, Ilde Lepore, au 514-398-8302.

Coordonnées pour les renseignements sur cette étude :
Pour toutes questions à propos de la structure de cette étude ou si vous désirez de plus amples renseignements, vous pouvez communiquer d'une façon anonyme (gestionnaire de recherche) au 514-398-4184 poste : 0481. De plus, vous pouvez également communiquer avec l'investigatrice principale, Dre Catherine Sabiston, au 514-398-4184 poste : 00890.

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CONSENTEMENT ÉCLAIRÉ - FORMULAIRE DE LA PARTICIPANTE

Titre du projet de recherche :
L'impact de l'activité physique sur la santé physique et mentale chez les survivantes du cancer du sein au cours du temps.

Cette étude m'a été expliquée et j'en accepte les termes. J'ai eu l'occasion de poser des questions et j'ai reçu des réponses satisfaisantes à mes questions. J'ai été avisée que je peux refuser de participer ou que je peux me retirer en tout temps, et ce, sans perte des avantages de prestation pour soin de santé auxquels j'aurais droit en d'autres circonstances. J'accepte de plein gré de participer à cette étude, qui consiste à remplir 6 questionnaires prédéterminés, à fournir des échantillons de salive lors de 3 jours non consécutifs, à fournir un petit prélèvement de sang pour donner une goutte de sang sur un tampon stérile, de porter un accéléromètre pour une période de 7 jours à 6 occurrences au cours des 18 prochains mois, et de porter un podomètre tout au long de la durée de l'étude. J'ai signé et reçu une copie de ce formulaire pour mes dossiers.

Date	Signature de la participante	Écrire en caractères d'imprimerie
Date	Investigatrice/Co-investigateur (trice)	Écrire en caractères d'imprimerie

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Téléphone : 514-398-4184

CONSENTEMENT ÉCLAIRÉ - FORMULAIRE DE LA PARTICIPANTE (copie)

Titre du projet de recherche :
L'impact de l'activité physique sur la santé physique et mentale chez les survivantes du cancer du sein au cours du temps.

Cette étude m'a été expliquée et j'en accepte les termes. J'ai eu l'occasion de poser des questions et j'ai reçu des réponses satisfaisantes à mes questions. J'ai été avisée que je peux refuser de participer ou que je peux me retirer en tout temps, et ce, sans perte des avantages de prestation pour soin de santé auxquels j'aurais droit en d'autres circonstances. J'accepte de plein gré de participer à cette étude, qui consiste à remplir 6 questionnaires prédéterminés, à fournir des échantillons de salive lors de 3 jours non consécutifs, à fournir un petit prélèvement de sang pour donner une goutte de sang sur un tampon stérile, de porter un accéléromètre pour une période de 7 jours à 6 occurrences au cours des 18 prochains mois, et de porter un podomètre tout au long de la durée de l'étude. J'ai signé et reçu une copie de ce formulaire pour mes dossiers.

_____	_____	_____
Date	Signature de la participante	Écrire en caractères d'imprimerie
_____	_____	_____
Date	Investigatrice/Co-investigateur (trice)	Écrire en caractères d'imprimerie

Appendix C

Background & Demographics

The following information will only be asked of you once. Please report as accurately as possible.

Date (day/month/year): _____

Personal Information

1. Identification number (provided by researcher): _____
2. Date of birth (day/month /year) _____
3. People living in Canada come from many different cultural and racial backgrounds.
   Are you (check all that apply):

   ☐… White?
   ☐… Chinese?
   ☐… South Asian (e.g., East Indian, Pakistani, Sri Lankan)?
   ☐… Black?
   ☐… Filipino?
   ☐… Latin American?
   ☐… Southeast Asian (e.g., Cambodian, Indonesian, Laotian, Vietnamese)?
   ☐… Arab?
   ☐… West Asian (e.g., Afghan, Iranian)?
   ☐… Japanese?
   ☐… Korean?
   ☐…Other – Specify _____

4. What language you speak most often at home?

☐ English	☐ Portuguese
☐ French	☐ Punjabi
☐ Arabic	☐ Spanish
☐ Chinese	☐ Tagalog (Pilipino)
☐ Cree	☐ Ukrainian
☐ German	☐ Vietnamese
☐ Greek	☐ Persian
☐ Dutch	☐ Hindi
☐ Hungarian	☐ Russian
☐ Italian	☐ Tamil

☐ Korean

☐ Other, specify: _____

5. What is your highest level of education?

☐ Did not complete high school
☐ High school diploma
☐ Some post-secondary, but did not complete diploma or degree
☐ College or technical diploma or certificate (CEGEP, community college)
☐ University undergraduate degree
☐ Post-graduate degree

6. What is your best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months?

$ ☐☐☐☐☐☐

7. How many members of the household contribute to the total income? ☐☐

8. How many individuals live in the home? ☐☐

   a. How many individuals are less than 12 years of age? ☐☐
   b. How many individuals are 13 to 18 years of age? ☐☐
   c. How many individuals are 19 to 30 years of age? ☐☐
   d. How many individuals are 31 to 64 years of age? ☐☐
   e. How many individuals are 65 years of age and older? ☐☐

9. What is your marital status?

☐ Single
☐ Married or living with a life partner
☐ Separated
☐ Divorced
☐ Widowed

10. Which of the following describes you :

☐ I have no children OR, I have :

☐ Daughter(s) ⇒ How many daughters? |_|_|
☐ Step-Daughter(s) ⇒ How many step-daughters? |_|_|
☐ Son(s) ⇒ How many sons? |_|_|
☐ Step-son(s) ⇒ How many daughters? |_|_|
☐ Grand-Daughter(s) ⇒ How many grand-daughters? |_|_|
☐ Grand-son(s) ⇒ How many grand-sons? |_|_|

Breast Cancer Information

1. What was the date of your most recent diagnosis for breast cancer? _____

   _____

2. What stage of breast cancer were you diagnosed with?

   - ☐ Stage 0
   - ☐ Stage I
   - ☐ Stage II
   - ☐ Stage III
   - ☐ Stage IV

3. Indicate which medical treatments have you received for breast cancer and the date of the last treatment, if applicable

Treatment	**Received?**	**Date of last surgery/treatment (day/month/year)**
Lymph or axillary node dissection	☐ Yes ☐ No	_____
Lumpectomy	☐ Yes ☐ No	_____
Single Mastectomy	☐ Yes ☐ No	_____
Double Mastectomy	☐ Yes ☐ No	_____
Reconstructive surgery	☐ Yes ☐ No	_____
Chemotherapy	☐ Yes ☐ No	_____
Radiotherapy	☐ Yes ☐ No	_____
Hormonal therapy	☐ Yes ☐ No	_____
Other Specify:		_____

4. Please describe:

    a. The type of chemotherapy you were prescribed: _____

    _____

    _____

    b. The location of radiation you received: _____

    _____

    _____

    c. The hormones you have been prescribed: _____

    _____

    _____

5. What was your usual weight, in pounds, before breast cancer diagnosis?_____lbs

6. Describe your adult weight status before breast cancer diagnosis:

    ☐ Very steady adult weight (little to no weight losses or gains per year)
    ☐ Fairly steady adult weight (weight changed by less than 2 pounds per year)
    ☐ Fairly unstable adult weight (weight changed by 2 to 5 pounds per year)
    ☐ Very unstable adult weight (weight changed by more than 5 pounds per year)

7. What is your height, in feet and inches? _____ft, _____in.

8. Are you:

    ☐ Pre-menopausal
    ☐ Going through menopause
    ☐ Post-menopausal

Weight and Diet

For each of the following stressors listed below, please indicate how often you experience them on a 5-point scale. (1=almost never to 5=very often)

	Almost Never	Seldom	Some-times	Often	Very often
Negative attitudes about my body shape and appearance	1	2	3	4	5
Feeling overweight	1	2	3	4	5
Changes in appearance resulting from cancer treatment	1	2	3	4	5
Concerns for making healthy dietary choices	1	2	3	4	5
Concerns for meeting dietary recommendations	1	2	3	4	5
Limited contact with healthcare	1	2	3	4	5

2. Are there any other weight or diet concerns that were not listed above that are of concern to you? (Please specify and indicate how often you experience the stressor):

	Almost Never	Seldom	Some-times	Often	Very often
1.	1	2	3	4	5
2.	1	2	3	4	5
3.	1	2	3	4	5
4.	1	2	3	4	5
5.	1	2	3	4	5

3. In general, how motivated are you to make positive bahavioural/lifestyle changes?

Not at all motivated				**Very motivated**
1	**2**	**3**	**4**	**5**

4. In general, do you believe you are a healthy eater?

Not at all				**Very healthy**
1	**2**	**3**	**4**	**5**

5. For you, how important is eating a healthy diet?

Not at all important				**Very important**
1	**2**	**3**	**4**	**5**

6. Within the past year, have you thought about making positive changes to your diet?

☐ Yes ☐ No

7. Within the past year, have you made positive changes to your diet?

☐ Yes ☐ No

8. In general, how motivated are you to make positive changes to your diet?

Not at all motivated				**Very motivated**
1	**2**	**3**	**4**	**5**

9. How valuable do you find eating a healthy diet?

Not at all valuable				**Very valuable**
1	**2**	**3**	**4**	**5**

1. In general, how many timers per day, week or month do you drink 100% fruit juice such as orange, grapefruit, or tomato juice?
   **100% fruit juice: a juice with no sugar or sweetener added*

_____ ☐ per day ☐ per week ☐ per month

2. Not counting juice, how many times per day, week or month do you eat fruit?
   ** This can include canned, frozen and fresh fruit, eaten on its own or with other food, cooked or raw*

_____ ☐ per day ☐ per week ☐ per month

3. How many times per day, week or month do you eat a green salad?
   **A green salad includes lettuce with or without other ingredients*

_____ ☐ per day ☐ per week ☐ per month

4. NOT including french fries, fried potatoes, or potato chips, how many times per day, week or month do you eat potatoes?

_____ ☐ per day ☐ per week ☐ per month

5. How many times per day, week or month do you eat carrots?

_____ ☐ per day ☐ per week ☐ per month

6. Not counting carrots, potatoes, or green salad, how many times per day, week or month do you eat other vegetables?

_____ ☐ per day ☐ per week ☐ per month

7. On average, how many times per day, week or month do you consume grain products?
   **examples of grains: bread, bagel, rice, pasta, cereal*

_____ ☐ per day ☐ per week ☐ per month

8. On average, how many times per day, week or month do you consume meat or meat alternative products?
   **meat alternatives: beans, eggs, peanut butter*

_____ ☐ per day ☐ per week ☐ per month

9. On average, how many times per day, week or month do you consume milk or milk alternative products?
   **milk alternatives: soy beverages*

_____ ☐ per day ☐ per week ☐ per month

10. How many daily servings of fruits and vegetables does Canada's Food Guide recommend for women your age?

    ☐ 19-50 years old _____

    ☐ 51+ years old _____

11. Based on your response to Q19, are you meeting the recommendations for fruits and vegetables?

    ☐ Yes ☐ No

12. Within the past year, have you taken any vitamin supplements? *If yes, please specify the type.*

    ☐ Yes ☐ No

    _____
    _____
    _____

13. I feel confident in my ability to maintain a healthy diet.

Not at all true				**Very true**
1	**2**	**3**	**4**	**5**

23. In general, where do you get most of your information about healthy eating? (Check all that apply)

- ☐ Family
- ☐ Friends
- ☐ Other cancer survivors
- ☐ Books/pamphlets
- ☐ Internet
- ☐ Healthcare practitioners
- ☐ Other (please specify) : _____

24. Since your cancer diagnosis, have any of the following healthcare practitioner(s) provided you with dietary recommendations and information? (Check all that apply)

- ☐ No healthcare practitioner has provided me with dietary information
- ☐ Physician
- ☐ Dietitian
- ☐ Nurse/ Nurse practitioner
- ☐ Psychologist
- ☐ Physical Therapist
- ☐ Other (please specify) :_____

25. How was this information given to you? (Check all that apply)

- ☐ Face-to-face counselling
- ☐ Book/pamphlet/flyer
- ☐ Other (please specify) :_____

26. Current weight:

Weight (pounds) _____lb

Appendix D

Antécédents et données démographiques

Les questions qui suivent vous seront demandées qu'une seule fois. Veuillez répondre aussi précisément que possible.

Date (jour/mois/année) : _____

Information personnelle

11. Numéro d'identification (fourni par la chercheuse): _____

12. Date de naissance (jour/mois/année) _____

13. Les gens qui vivent au Canada viennent de différentes cultures et sont de différents antécédents raciaux ou ethniques.
Êtes-vous (cochez tout ce qui s'applique):

☐… de race blanche?
☐… Chinois?
☐… d'Asie du Sud (p. ex. Indien d'Asie, Pakistanais, Sri-Lankais)?
☐…de race noire?
☐…Filipien?
☐… d'Amérique latine?
☐… de l'Asie du Sud-Est (p. ex., Cambodgien, Indonésien, Laotien, Vietnamien)
☐… Arabe?
☐… De l'Asie occidentale (p. ex., Afghan, Iranien)?
☐… Japonais?
☐… Koréen?
☐…Autres – Veuillez préciser_____

4. Quelle langue parlez-vous le plus souvent à la maison?

☐ Anglais	☐ Portugais
☐ Français	☐ Punjabi
☐ Arabe	☐ Espagnol
☐ Chinois	☐ Tagal (Pilipino)
☐ Cri	☐ Ukrainien
☐ Allemand	☐ Vietnamien
☐ Grec	☐ Persan
☐ Néerlandais	☐ Hindi
☐ Hongrois	☐ Russe
☐ Italien	☐ Tamil

☐ Coréen

☐ Autre, veuillez préciser: _____

5. Quel est votre plus haut niveau de scolarité que vous avez atteint?

☐ Études secondaires non complétées
☐ Diplôme de fin d'études secondaires
☐ Études postsecondaires non complétées, sans diplôme
☐ Études collégiales ou diplôme technique ou certificat (CEGEP, collège communautaire)
☐ Universitaire, diplôme d'études de premier cycle
☐ Universitaire, diplôme d'études de cycles supérieurs

6. À combien estimez-vous le revenu total, avant impôts et déductions, de tous les membres de la maisonnée, provenant de toutes sources au cours des 12 derniers mois?

☐☐☐☐☐☐$

7. Combien de membres de votre ménage contribuent au revenu total de votre maisonnée? ☐☐

8. Combien de personnes vivent dans votre résidence? ☐☐

   a. Combien de personnes sont âgées de moins de 12 ans? ☐☐
   b. Combien de personnes sont âgées de 13 et 18 ans? ☐☐
   c. Combien de personnes sont âgées de 19 et 30 ans? ☐☐
   d. Combien de personnes sont âgées de 31 et 64 ans? ☐☐
   e. Combien de personnes sont âgées de plus de 65 ans? ☐☐

9. Quel est votre état matrimonial?

☐ Célibataire
☐ Mariée ou vivant avec conjoint de fait
☐ Séparée
☐ Divorcée
☐ Veuve

10. Lequel des énoncés suivants vous décrit le mieux :

☐ Je n'ai pas d'enfant OU, j'ai des:

☐ Filles ⇒ Combien de filles? |_|_|
☐ Belles-filles ⇒ Combien de belles-filles? |_|_|
☐ Fils ⇒ Combien de fils? |_|_|
☐ Beaux-fils? ⇒ Combien de beaux-fils? |_|_|
☐ Petites-filles ⇒ Combien de petites-filles? |_|_|
☐ Petits-fils ⇒ Combien de petits-fils? |_|_|

Questions sur le cancer du sein

1. À quelle date avez-vous reçu votre plus récent diagnostic du cancer du sein

2. Pour quel stade du cancer du sein avez-vous été diagnostiquée?

   ☐ Stade 0
   ☐ Stade I
   ☐ Stade II
   ☐ Stade III
   ☐ Stade IV

3. Veuillez indiquer quels traitements médicaux vous avez reçus pour le cancer du sein et la date du dernier traitement, s'il y a lieu

Traitement	**Reçu?**	**Date de la dernière opération ou du dernier traitement (jour/mois/année)**
Curage ganglionnaire ou axillaire	☐ Oui ☐ Non	
Chirurgie mammaire conservatrice (tumorectomie)	☐ Oui ☐ Non	
Mastectomie simple	☐ Oui ☐ Non	
Mastectomie totale	☐ Oui ☐ Non	
Chirurgie reconstructive	☐ Oui ☐ Non	
Chimiothérapie	☐ Oui ☐ Non	
Radiothérapie	☐ Oui ☐ Non	
Hormonothérapie	☐ Oui ☐ Non	
Autre, veuillez préciser:		

4. Veuillez décrire:

   a. Le type de chimiothérapie prescrit: _____

      _____

      _____

b. L'endroit traité par radiation: _____

_____

_____

c. Les hormones qui vous ont été prescrites: _____

_____

_____

5. Quel était votre poids régulier, en livres, avant le diagnostic du cancer? _____livres

6. Décrivez votre poids adulte avant et après le diagnostic de cancer du sein:

☐ Poids adulte très stable (peu de perte ou de gain de poids par année)
☐ Poids adulte assez stable (variation de moins de 2 livres par année)
☐ Poids adulte assez instable (variation de 2 à 5 livres par année)
☐ Poids adulte très instable (variation de plus de 5 livres par année)

7. Quelle est votre grandeur en pieds et pouces? _____pied,
_____pouce

8. Êtes vous:

☐ en préménopause
☐ en cours de ménopause
☐ ménopausée

Poids et diète

Pour chacun des énoncés suivants, veuillez indiquer combien de fois vous les éprouvez selon l'échelle indiquée (1= Presque jamais jusqu'à 5= très souvent)

	Presque jamais	Rarement	Parfois	Souvent	Très souvent
Des attitudes négatives à propos de mon corps	1	2	3	4	5
Je me sens avec un surplus de poids	1	2	3	4	5
Je ressens un changement dans mon apparence résultant du traitement contre le cancer	1	2	3	4	5
Désirs de faire des choix alimentaires sains	1	2	3	4	5
Désirs de rencontrer les recommandations alimentaires	1	2	3	4	5
J'ai peu de communication avec des professionnels de la santé	1	2	3	4	5

2. Y a-t-il d'autres inquiétudes à propos du poids et de la diète qui n'ont pas été mentionnées ci-haut et que vous jugez importantes? (Veuillez les nommer et préciser combien de fois vous éprouvez cet élément de stress):

	Presque jamais	Rarement	Parfois	Souvent	Très souvent
1.	1	2	3	4	5
2.	1	2	3	4	5
3.	1	2	3	4	5
4.	1	2	3	4	5
5.	1	2	3	4	5

3. Normalement, dans quelle mesure êtes-vous encouragée à faire des changements positifs dans vos habitudes ou votre mode de vie?

Pas du tout motivée				**Très motivée**
1	**2**	**3**	**4**	**5**

4. D'une façon générale, est-ce que vous vous percevez comme une personne ayant de saines habitudes alimentaires?

Pas du tout				**Vraiment saine**
1	**2**	**3**	**4**	**5**

5. Est-ce important pour vous d'avoir une alimentation saine?

Pas important du tout				**Très important**
1	**2**	**3**	**4**	**5**

6. Au cours de la dernière année, avez-vous pensé faire des changements positifs à votre alimentation?

☐ Oui ☐ Non

7. Au cours de la dernière année, avez-vous fait des changements positifs à votre alimentation?

☐ Oui ☐ Non

8. D'une façon générale, êtes- vous motivée à faire des changements positifs dans votre alimentation

Pas du tout motivée				**Très motivée**
1	**2**	**3**	**4**	**5**

9. À quel point trouvez-vous cela bon d'avoir de saines habitudes alimentaires?

Pas du tout				**Très bénéfique**
1	**2**	**3**	**4**	**5**

10. D'une façon générale, combien de fois par jour, par semaine ou par mois buvez-vous des jus de fruits 100% fruits (par. ex. Jus d'orange, de pamplemousse ou de tomate?

**les jus 100 % sont des jus sans sucre ou sans édulcorant ajouté*

_____ ☐ par jour ☐ par semaine ☐ par mois

11. Sans compter les jus, combien de fois par jour, par semaine ou par mois mangez-vous des fruits?

**Incluant les fruits en conserve, congelés ou frais, consommés seuls ou avec d'autres aliments ou crus.*

_____ ☐ par jour ☐ par semaine ☐ par mois

12. Combien de fois par jour, par semaine ou par mois mangez-vous une salade verte?
**Une salade verte comprend de la laitue avec ou sans d'autres ingrédients*

_____ ☐ par jour ☐ par semaine ☐ par mois

13. En excluant les frittes, les pommes de terre rôties ou les croustilles, combien de fois par jour, par semaine ou par mois mangez-vous des pommes de terre?

_____ ☐ par jour ☐ par semaine ☐ par mois

14. Combien de fois par jour, par semaine ou par mois mangez-vous des carottes?

_____ ☐ par jour ☐ par semaine ☐ par mois

15. Excluant les carottes, les pommes de terre et les salades vertes, combien de fois par jour, par semaine ou par mois mangez-vous d'autres légumes?

_____ ☐ par jour ☐ par semaine ☐ par mois

16. En moyenne, combien de fois par jour mangez-vous des produits céréaliers?
**exemple de produits céréaliers : pain, bagel, riz, pâtes*

_____ ☐ par jour ☐ par semaine ☐ par mois

17. En moyenne, combien de fois par jour mangez-vous de la viande ou des substituts de la viande?
** substituts de la viande : fèves, œufs, beurre d'arachide*

_____ ☐ par jour ☐ par semaine ☐ par mois

18. En moyenne, combien de fois par jour consommez-vous du lait ou des substituts au lait?
**substituts au lait: breuvages de soya*

19. À votre avis, combien de portions de fruits et de légumes sont recommandées pour une femme de votre âge?

☐ de 19 à 50 ans _____

☐ 51 ans et plus _____

20. À partir de votre réponse à la question 19, est-ce que vous rencontrez les quantités de fruits et de légumes recommandés?

☐ Oui ☐ Non

21. Au cours de la dernière année, avez-vous consommé des suppléments vitaminiques? Si oui, veuillez en indiquer le type.

☐ Oui ☐ Non

_____
_____
_____

22. J'ai confiance dans mes capacités de maintenir une alimentation saine.

Pas important du vrai				**Très vrais**
1	**2**	**3**	**4**	**5**

23. De façon générale, quelle est votre principale source d'information à propos d'une alimentation saine? (Cochez tout ce qui s'applique)

☐ Famille
☐ Amis
☐ Autres survivantes du cancer
☐ Livres/ brochures
☐ Internet
☐ Professionnels de la santé
☐ Autre (veuillez préciser) : _____

24. Depuis votre diagnostic de cancer, est-ce qu'un ou plusieurs professionnels de santé de la liste suivante vous ont fourni des renseignements sur les recommandations alimentaires? (Cochez tout ce qui s'applique)

☐ Non, aucun professionnel de santé de m'a fourni des renseignements à propos des recommandations alimentaires.
☐ Médecin
☐ Diététiste
☐ Infirmière / infirmière praticienne
☐ Psychologue
☐ Physiothérapeuthe
☐ Autre (Veuillez préciser) :_____

25. Comment ces renseignements vous ont-ils été donnés? (Cochez tout ce qui s'applique)

☐ Consultation face-à-face
☐ Livres/ brochures /dépliants
☐ Autre (Veuillez préciser) :_____

26. Votre poids actuel: poids _____ lb