Hunger on Campus: Food Insecurity among Post-Secondary Students with Children at the University of Alberta

by

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Abstract

Background: Food insecurity is the limited or uncertain ability to obtain the quantity or quality of food that an individual or household needs due to financial constraints. Food insecurity has been shown to have a variety of negative impacts on health and wellbeing. Post-secondary students represent a group that may be vulnerable to food insecurity, but research in this area is limited.

Objectives: The objectives of this research were to review the literature about food insecurity among post-secondary students and explore the qualitative experience of food insecurity among post-secondary students with children.

Methods: In study one a narrative review of the literature was conducted using electronic databases and grey literature searches. In study two, face-to-face semi-structured interviews were conducted with food insecure student clients of a Campus-based food bank who had children under the age of 18 in their care. Transcripts underwent conventional content analysis.

Results: In study one, 21 studies were included which examined food insecurity in 18,450 students. Prevalence estimates of food insecurity ranged from 12.7 to 89%. Food insecurity risk factors included being low income, living away from home, or being an ethnic minority. A variety of negative consequences of food insecurity were reported (e.g. reduced academic performance, poor diet quality) and strategies to mitigate food insecurity were numerous (e.g. reducing the number or size of meals, borrowing from friends or relatives). In study two a total of nine students were included. All students were full-time students and had 1 (n=7) or 2 children (n=2) under 18-years-old in their care. Due to the breadth of issues examined, data

were organized into two separate, but related manuscripts. The first paper examined reasons why students used the food bank; feelings about using the food bank; the consequences of food insecurity for students; and, barriers to students of overcoming food insecurity. The primary impetus for food bank use was in response to a financial crisis that left students with insufficient funds to buy food such as loss of income, shortage in student loan funding, and unexpected bills. Students felt embarrassment, shame or conflicted feelings such as guilt about receiving food hampers. Students experienced negative effects on academic outcomes as well as on mental and social wellbeing. The second paper examined results relating to the impact of food insecurity on the wellbeing of students' children, the experience with the food received from the Campus Food Bank for students and their children as well as the coping strategies that students with children used to deal with food insecurity. Findings indicate that some students felt that the donated food they received was of poor quality or not appropriate for their culture or religion. Students tried to shield their children from the negative effects of food insecurity by sacrificing their own nutrition in times of food shortage, which included giving children higher quality foods, forfeiting food so children could eat, and ensuring children's dietary needs were met before their own. Students used a variety of coping strategies to manage their food insecurity

Discussion/Conclusions: Food insecurity is an issue among post-secondary students and is associated with a number of negative outcomes, and warrants further research to determine the causes and consequences of food insecurity in this population. Food insecure students with children experienced a range of negative effects on their academic achievement and mental

and social wellbeing and may be at risk for nutritional deficiencies by limiting or varying their own diet in order to ensure their children's needs are met.

Preface

This thesis is an original work by Sarah Lee. The research projects, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, "Qualitative research with student clients of the University of Alberta Campus Food Bank" No. Pro00040231, August 20, 2013.

Chapter 3 of this thesis has been submitted for publication as Lee, S., Hanbazaza, M., Ball, G.D.C., Farmer, A.P., Maximova, K., and Willows, N.D., "Food insecurity among post-secondary students in developed countries: a narrative review" *British Food Journal*. I was responsible for literature search, analysis and writing of the manuscript. Hanbazaza M. also verified the literature search and analysis and helped with the writing of the manuscript. Ball G.D.C. and Farmer A.P were involved in the development of concept and data analysis and contributed to the manuscript edits. Willows, N.D. was the supervisory author and was involved with concept formation, the data analysis plan, and manuscript edits.

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List of Abbreviations

AFSSM	Adult Food Security Survey Module
AHS	Alberta Health Services
CCHS	Canadian Community Health Survey
CFB	Campus Food Bank
CUFBA	College and University Food Bank Alliance
ECHA	Edmonton Clinic Health Academy
FSSM	Food Security Survey Module
HFSSM	Household Food Security Survey Module
NNFB	National Nutritious Food Basket
UAlberta	University of Alberta
USDA	United States Department of Agriculture

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Chapter 1: Introduction

On a global level, food security is defined as "a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life." (Food and Agriculture Organization [FAO], 2002) Over time, the definitions of food security and food insecurity have evolved and differentiations have been made for food insecurity at the individual, household and community levels as well as varying resources settings. At the individual level, food insecurity "exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain." (Anderson, 1990) In Canada, household food insecurity is defined as "inadequate or insecure access to food because of financial constraints." (Tarasuk et al., 2016) The experience of household food insecurity can vary substantially between developing and developed countries, as well as the primary causes and consequences of household food insecurity. (Food and Agriculture Organization, International Fund for Agricultural Development, & World Food Program, 2013) For the purpose of this thesis, I examined household food insecurity as it related to developed countries. In developed countries such as Canada, the United States and Australia, food insecurity at the household level is experienced along a gradient of severity ranging from anxiety about food to reduced quality and quantity of food and to severe food insecurity, including hunger. (Burns, 2004; Coleman-Jensen, Rabbitt, Gregory, & Singh, 2015; Kirkpatrick & Tarasuk, 2008)

Those experiencing food insecurity are at risk for a number of negative consequences including compromised diet quality (Fram, Ritchie, Rosen, & Frongillo, 2015; Kirkpatrick & Tarasuk, 2008) and both short- and long-term negative impacts on academic achievement, health and well-being, and social functioning. (Ashiabi, 2005; Holben, 2010; Jyoti, Frongillo, & Jones, 2005; McIntyre, Wu, Kwok, & Patten, 2017; Ramsey, Giskes, Turrell, & Gallegos, 2012) The food insecurity literature has focused primarily on low-income households, including households with children, visible minorities, and/or main sources of income from government assistance. (Coleman-Jensen et al., 2015; Lindberg, Lawrence, Gold, Friel, & Pegram, 2015; Tarasuk et al., 2016)

The food insecure use various coping strategies to acquire food when they do not have enough money to buy food, such as relying on food charities, budgeting, delaying bill payments, or purchasing food on credit. (Bazerghi, McKay, & Dunn, 2016; Holben, 2010; Kaiser, & Hermsen, 2015; Wood, Shultz, Edlefsen, & Butkus, 2006) Food insecurity among post-secondary students remains relatively unexplored with only a small number of studies published in recent years. (Bruening, Brennhofer, van Woerden, Todd, & Laska, 2016; Chaparro, Zaghlou, Holck, & Dobbs, 2009; Farahbakhsh et al., 2015; Gaines, Robb, Knol, & Sickler, 2014; Maroto, Snelling, & Link, 2013; Patton-Lopez, Lopez-Cevallos, Cancel-Tirad, & Vazquez, 2014) These studies are primarily quantitative in nature and examine the prevalence of food insecurity among post-secondary students in Canada, United States, and Australia; few qualitative studies have explored post-secondary food insecurity in depth. (Nugent, 2011; Stewin, 2013) There is especially a lack of qualitative literature examining the experience of food insecurity among this population and no literature focusing on students with children. The pervasiveness of charitable

food organizations on campuses in the United States and Canada suggests that food insecurity is a salient problem for many post-secondary students. (College and University Food Bank Alliance, 2017; Silverthorn, 2016) In the United States, there are more than 500 campus members of the College and University Food Bank Alliance (CUFBA), which is a professional organization consisting of campus-based programs focused on alleviating food insecurity, hunger, and poverty among college and university students. (College and University Food Bank Alliance, 2017) In 2016, at least 104 university and college campuses in Canada had a food bank. (Silverthorn, 2016) Post-secondary students who are food insecure may endure numerous negative impacts of not having sufficient financial resources to ensure a consistent food supply, even if the condition of food insecurity is transient and experienced for only the time required to obtain a degree or diploma. (Silverthorn, 2016) Research on post-secondary students is needed to help better inform government and university policy makers how to address the issue of post-secondary food insecurity.

1.1 Rationale

One group that may be at risk for food insecurity is post-secondary students, due to their reduced earning potential and high tuition costs as well as often being away from their primary support systems. (Cady, 2014; Luong, 2010; Silverthorn, 2016) Also, the proliferation of food banks at post-secondary institutions across North America suggests that food insecurity among students is a growing problem. (College and University Food Banks Alliance, 2017; Silverthorn, 2016)

While studies have begun to explore the prevalence of food insecurity among post-secondary students, the topic of food insecurity among students still remains a relatively

unaddressed area in the literature. This thesis includes two related studies. First, in a narrative review I examined the literature to identify the prevalence of post-secondary student food insecurity and to identify risk factors contributing to and consequences of food insecurity in post-secondary students. Second, using qualitative inquiry, I explored the experience of food insecurity among students with children, who utilized a university-based food bank. In this qualitative study I explored whether food insecurity among students is associated with negative health and dietary consequences both for them and their children and whether students reported any perceived negative academic outcomes while experiencing food insecurity. The qualitative study also aimed to understand which coping strategies were utilized by food insecure post-secondary students with children.

The research conducted for this thesis is one of the first to review the research about food insecurity among post-secondary students and explore the qualitative experience of food insecurity among post-secondary students with children. Findings of this study may have important implications for government and university policies related to student financial assistance, including student loans as well as to help inform discussion around food programs geared towards students. It may also be part of the impetus to inspire further research examining the broader issue of post-secondary student food insecurity. In the final thesis chapter, I discussed ways in which findings from my research may be applied to address the issue of food insecurity among students.

1.2 Objectives

Study 1 – Narrative Review

The objectives of the narrative review were to identify:

1. Prevalence of food insecurity in post-secondary students in developed countries.
2. Risk factors contributing to food insecurity in post-secondary students.
3. Consequences of food insecurity (e.g., dietary quality and adequacy, health outcomes and academic performance).
4. Coping strategies for managing food insecurity at the individual and household levels.

Study 2 – Qualitative Study

The qualitative data was organized into two separate, but related manuscripts due to the breadth of issues explored.

Paper 1 includes the following objectives:

Among post-secondary students with children who were also clients of the Campus Food Bank, this qualitative study was designed to:

1. Explore students' reasons for using the Campus Food Bank.
2. Explore students' feelings about using the Campus Food Bank.
3. Explore the impact of food insecurity on the quality of academic experience and achievement.
4. Explore the impact of food insecurity on the wellbeing of students.
5. Understand the barriers to overcoming food insecurity.

Paper 2 includes the following objectives:

Among post-secondary students with children who were also clients of the Campus Food Bank, this qualitative study was designed to:

6. Explore the impact of food insecurity on the wellbeing of students' children.

7. Explore the experience with the food received from the Campus Food Bank for students and their children.
8. Identify coping strategies that students with children used to deal with food insecurity.

1.3 References

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Chapter 2: Literature Review

2.1 Food Security and Food Insecurity Defined

Researchers have long struggled to define food security, as is evident by the fact that in a 1992 review of food security, the authors found there were over 200 different definitions being used in published literature. (Maxwell & Smith, 1992) One of the earliest attempts to define food security was at the 1974 World Food Summit which stated that food security is the "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices". (United Nations, 1975) This definition has been refined over time to the current global definition that defines food security as "a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life." (Food and Agriculture Organization (FAO), 2002) This definition of food security includes four different dimensions: food availability, economic and physical access to food, food utilization and stability (vulnerability and shocks) over time. (Food and Agriculture Organization, International Fund for Agricultural Development, & World Food Program, 2013).

Food insecurity is not the inverse of food security, which has also been subject to a variety of definitions. For the purpose of this thesis, food insecurity was defined at the household level as "inadequate or insecure access to food because of financial constraints." (Tarasuk, Mitchell, & Dachner, 2016) This definition allows for the possibility that food insecurity exists even when there is adequate food available, but there is anxiety over food

availability or the ability to attain food in the future. It also means that households experiencing food insecurity may have difficulty obtaining food of adequate nutritional quality to meet their needs, although they may have a sufficient quantity of food to avoid the sensation of hunger. (Murimi, Kanyi, Mupfudze, Mbogori, & Amin, 2016; Tarasuk, 2001)

There are different classifications of food insecurity depending on the period of time an individual experiences food hardship. Food insecurity can be acute or chronic. (FAO, 2008) Chronic food insecurity usually occurs as a result of "extended periods of poverty, lack of assets and inadequate access to productive or financial resources" (FAO, 2008) while transitory food insecurity occurs due to "short-term shocks and fluctuations in food availability and food access, including year-to-year variations in domestic food production, food prices and household incomes." (FAO, 2008) Both short- and long-term food insecurity can result in negative health and dietary consequences, which are also affected by the severity of food insecurity experienced. (FAO, 2008) In developed countries such as Canada, the United States and Australia, food insecurity is often experienced along a gradient of severity ranging from anxiety about food to reduced quality and quantity of food and finally a more severe food insecurity including hunger. (Burns, 2004; Coleman-Jensen, Rabbitt, Gregory, & Singh, 2015; Kirkpatrick & Tarasuk, 2008) As there are different levels of food insecurity, there are also a variety of different measurement tools for food insecurity, including those for individual, household, and community levels of food insecurity.

2.2 Measurement of Food Insecurity

In Canada, national and provincial food insecurity data are collected primarily using the Canadian Community Health Survey (CCHS), which measures food insecurity using the

Household Food Security Survey Module (HFSSM), a validated measurement tool of household food security adapted from the income related food security measurement tool used in the United States. (Bickel, Nord, Price, Hamilton, & Cook, 2000) The HFSSM is comprised of 18 items, 10 of which relate to the experiences of adults in the household and eight that are specific to the experiences of children under the age of 18 years in the household. (Health Canada, 2007) There are also shorter versions of this tool, which are the 10-item Adult Food Security Survey Module and the 6-item short form of the Food Security Survey Module, though the short 6-item version is less precise and does not measure the most severe levels of food insecurity or ask about children in the household. (Coleman-Jensen et al., 2015) The HFSSM is appropriate for measuring food security at the household level only; it is not able to capture the food security status of individuals within a household and it is possible that not all members of a household experience the same degree of food insecurity. (Health Canada, 2007) Also, as the HFSSM is based on self-reported information regarding sufficiency of food and the resulting eating patterns, it is potentially subject to response biases. (Health Canada, 2006) Through this survey, Health Canada uses three categories to describe the food security situation experienced by households: food secure; food insecure, moderate; and food insecure, severe. (Health Canada, 2007) Based on the HFSSM, 'food secure' means that the household "had access, at all times throughout the previous year, to enough food for an active, healthy life for all household members." (Health Canada, 2007) Further, 'food insecure, moderate' means "households had indication of compromise in quality and/or quantity of food consumed" while 'food insecure, severe' means that "households had indication of reduced food intake and disrupted eating

patterns." (Health Canada, 2007) Both moderate and severe food insecure categories are included when calculating the prevalence of food insecurity in Canada.

2.3 Prevalence of Food Insecurity in Canada

The federal government started collecting national household-level food insecurity data in Canada in 2004 with the introduction of the HFSSM on the CCHS; it has been measuring the food insecurity situation consistently since then. (Health Canada, 2012) Since the HFFSM is an optional part of the CCHS, some jurisdictions opt out of collecting this data based on emerging population heath issues in that region, data gaps and data availability; therefore, the most recent statistics from the CCHS lack food insecurity data from some of the provinces and territories (e.g., British Columbia, Yukon). (Tarasuk et al., 2016) The most current information on household food security in Canada is from the 2013-2014 cycle of the CCHS, which showed that for the participating jurisdictions (Alberta, Saskatchewan, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, the Northwest Territories, and Nunavut) 12.0% of households experienced some level of food insecurity during the previous 12 months. (Tarasuk et al., 2016) The prevalence of food insecurity at the household level ranged from 10.6% in Saskatchewan to 46.8% in Nunavut. (Tarasuk et al., 2016) For Nunavut and the Northwest Territories, the prevalence was the highest observed since monitoring began in 2005. (Tarasuk et al., 2016) Notably, these most recent national statistics on food insecurity estimated that more than 1 in 6 children under the age of 18 lived in households that experienced food insecurity. (Tarasuk et al., 2016) The CCHS data does not include information on food insecurity among all potentially vulnerable groups, including post-secondary students.

2.4 Populations at Risk for Food Insecurity

Based on the data from the CCHS, certain types of households experience a higher prevalence of food insecurity including: households with children under the age of 18, lone-parent female headed families, low-income households, households on social assistance, black or Aboriginal households, and households of recent immigrants. (Tarasuk et al., 2016) Among all households with children that were surveyed, 15.6 % were food insecure. Among female lone-parent households 33.5% were food insecure. (Tarasuk et al., 2016) Based on the most recent CCHS data, it is estimated that 17.2% of children in Canada live in food insecure households. (Tarasuk et al., 2016) According to CCHS data, income is the strongest predictor of food insecurity. (Tarasuk et al, 2016). However, many other factors put households at risk for food insecurity including, the cost of food and essentials, geographic isolation, lack of transportation, and food literacy. (Howard & Edge, 2013)

Given their vulnerability to food insecurity, a large number of studies have been conducted to examine food insecurity among families with children in the United States and Canada. (Broughton, Janssen, Hertzman, Innis, & Frankish, 2006; Miller, Nepomnyaschy, Ibarra, & Garasky, 2014; Tarasuk et al., 2016) One study examined the predictors and outcomes of food insecurity among families with preschool children and found that although the prevalence of food insecurity was associated primarily with income, it was also with household and environmental factors. (Broughton et al., 2006) This same study found that the prevalence of food insecurity among participants was five times higher than in the general population where they resided. (Broughton et al., 2006)

In Canada, when comparing lone-mother households to lone-father households, the prevalence of food insecurity in lone-mother households is approximately three times that of single father households. (Tarasuk et al., 2016) In a study describing the household food security situation in Canada, it was found that more than half of lone-parent, single mothers lived in households characterized by poverty, which was largely due to females having lower incomes than their male counterparts, placing them at increased risk of food insecurity. (Che & Chen, 2001) A recent study aimed at uncovering the factors that contribute to a higher number of female compared to males experiencing food insecurity in Canada found that higher levels of food insecurity was associated with socioeconomic factors in single (non-married) female-lead households, but not in married households despite the females reporting higher food insecurity than their male counterparts. (Matheson & McIntrye, 2014) It is likely that this is due to the pervasive socio-economic disadvantage experienced by women compared to men as well as due to differences in perception and knowledge of food insecurity between genders. (Matheson & McIntyre, 2014)

2.5 Risk Factors for Food Insecurity in Canada

The National Nutritious Food Basket (NNFB) is a measurement used by the government of Canada to monitor the cost and affordability of healthy eating. (Health Canada, 2009) The NNFB describes the approximately 60 foods that represent a nutritious diet, which is used by researchers to gather the price and determine the cost of healthy eating for Canadians in the various provinces and territories. (Health Canada, 2009) Each province fares a bit differently in terms of affordability for the NNFB, but in Alberta, in 2015 the NNFB cost an average of $1089.54 monthly for a family of four with two children. (Alberta Health Services [AHS], 2017)

These costs may increase dependent on age of the children and whether or not the mother is pregnant or breastfeeding. (AHS, 2017) Currently the amount of social assistance received by a family of four would not be sufficient to cover the cost of the NNFB (Howard & Edge, 2013) leaving them vulnerable to food insecurity. This fact likely explains why CCHS data found that 61% of households whose major source of income was social assistance were food insecure. (Tarasuk et al., 2016)

Geographic isolation is another risk factor for food insecurity owing to the fact that those in rural or remote places often have limited food availability and high food costs. (Howard & Edge, 2013) This is particularly evident in the Northern Territories of Canada where, for example, in Nunavut the cost of food can be up to three times the national average. (Nunavut Bureau of Statistics, 2016) Additionally, national data shows that the highest rates of food insecurity occur in Nunavut and the Northwest Territories where 60% and 29% respectively, of households with children experience food insecurity. (Tarasuk et al., 2016)

2.6 Negative Consequences of Food Insecurity

2.6.1 Health and Wellbeing Consequences of Food insecurity

The impact of food insecurity on health has been examined many times in the literature with many studies showing an association between food insecurity and negative health outcomes. At a national level one study showed clearly that in Canada food insecurity is associated with increased health care costs annually. (Tarasuk et al., 2015) The study found that moderate food insecurity was associated with a 32% increase in annual health costs at the household level. (Tarasuk et al., 2015) On an individual level, food insecurity has been associated with both short- and long-term negative impacts on health, well-being, and social

functioning. (Ashiabi, 2005; Holben, 2010; McIntyre, Wu, Kwok, & Patten, 2017; Ramsey, Giskes, Turrell, & Gallegos, 2012; Willows, Veugelers, Raine, & Kuhle, 2011) Adults who are food insecure have higher rates of chronic disease such as diabetes and heart disease and also experience higher rates of mental illness. (Fuller-Thomson & Nimigon, 2008; Galesloot, McIntyre, Fenton, &Tyminski, 2012; McLeod & Veall, 2006; Vozoris & Tarasuk, 2003) However, the relationship between food insecurity and health is difficult to isolate as there are many other determinants of health involved and research has shown that there is a reciprocal cycle where food insecurity has an impact on health and health can also impact food security status. For example, one study found that chronic physical and mental health conditions may increase vulnerability to household food insecurity independent of household sociodemographic characteristics. (Tarasuk, Mitchell, McLaren, & McIntyre, 2013) Another study examined food insecurity among diabetic patients and found higher prevalence rates of household food insecurity compared to the general population. (Galesloot et al., 2012) Severe food insecurity in this population may compromise their ability to obtain the appropriate diet required for effective diabetes management, which may further exacerbate negative health outcomes. (Galesloot et al., 2012) While it is clear that there is an association between household food insecurity and health, the precise direction of this association is unclear and merits further research.

Children have also been shown to experience a myriad of negative outcomes as a consequence of food insecurity. (Pirkle et al., 2014; Ramsey, Giskes, Turrell, & Gallegos, 2011; Skalicky et al., 2006) In a review of the health outcomes of food insecurity, it was found that food-insecure children were twice as likely to report being in fair or poor health and at least 1.4

times more likely to have asthma, compared to food-secure children. (Gunderson & Ziliak, 2015) Other research has shown that experiencing hunger as a child can have long-lasting effects on the physical and mental health of children, such as placing them at greater risk for experiencing depression, and asthma in adolescence and early adulthood. (Kirkpatrick, McIntyre, & Potestio, 2010; McIntyre, Williams, Lavorato, & Patten, 2013) Another study has shown that early exposure to food insecurity may lead to higher risk of developing mental problems in children. (Melchior et al., 2012) In addition to negative health outcomes, food insecurity has been associated with poorer academic functioning in children. (Jyoti, Frongillo, & Jones, 2005)

2.6.2 Nutritional Consequences

A number of studies have shown that food insecurity can lead to compromised diet quality and nutritional inadequacies. (Dixon, Winkleby, & Radimer, 2001; Fram, Ritchie, Rosen, & Frongillo, 2015; Kirkpatrick & Tarasuk, 2008; Tarasuk, 2001) One study of women in food insecure households, found that they had lower intakes of vegetables and fruit, and meat and alternatives compared to women in food secure households. (Tarasuk, 2001) Another recent study found associations between food insecurity and poor diet quality, including suboptimal intakes of protein, fat, fibre, and several micronutrients. (Karen, Lovedeep, & Bonnie, 2017) In a systematic review of the associations between food insecurity and dietary quality, it was found that food-insecure adults had lower consumption of vegetables, fruit, and dairy products than did food secure adults while food insecure children showed lower fruit consumption compared to food-secure children. (Hanson & Connor, 2014) Food-insecure infants, toddlers, children and adolescents have also been shown to have higher rates of iron deficiency anemia, which is a

clinically important health indicator with known negative cognitive, behavioral and health consequences. (Skalicky et al., 2006; Eicher-Miller, McCabe, Boushey, Mason, & Weaver, 2009; Pirkle et al., 2014) Overall the nutritional and dietary consequences of food insecurity are widespread in both adults and children, which highlight the need for the consideration of these consequences among individuals experiencing food insecurity.

2.7 Coping Strategies

Those experiencing food insecurity often utilize a variety of different coping strategies to help ameliorate its negative effects and obtain food. Coping strategies can be defined as "the specific efforts, both behavioral and psychological, that people employ to master, tolerate, reduce, or minimize stressful events." (Taylor, 1998) For those who are food insecure, coping strategies can include things such as purchasing cheaper food, obtaining food from charitable food sources, such as food banks and food pantries, receiving food or money from friends and family, or forgoing other necessities in order to purchase food. (Farahbakhsh et al., 2015; Feeding America, 2014; McIntyre, Bartoo, Pow, & Postestio, 2012)

According to Feeding America (2014), the most common coping strategy used is purchasing cheaper food even though cheaper foods may also be lower in nutrients and nutritional value and can lead to negative health outcomes. The use of this coping strategy has been reported in a number of studies. (Hoisington, Shultz, & Butkus, 2002; Murimi et al., 2016; Wood et al., 2006) In one study of coping strategies among food pantry users, it was found that reducing unaffordable items, such as meat, and increasing the amount of cheap, but filling foods such as potatoes was a commonly used coping strategy. (Hoisington et al., 2002)

Obtaining food from food banks, food pantries or other assistance programs was also widely reported. (Hoisington et al., 2002; Murimi et al., 2016; Wood et al., 2006; Wicks, Trevena, & Quine, 2006) Other more extreme coping strategies included skipping meals or restricting access to household food by locking cupboards or fridges to ensure food would last. (Murimi et al., 2016; Wood et al., 2006)

In households with children, many of the above mentioned coping strategies are also used, but an additional coping strategy of parents is forgoing food in order to ensure their children's food needs are met. (McIntyre et al. 2003) This strategy may lead to increased risk of nutritional inadequacies and negative health outcomes among food insecure parents. (McIntyre et al., 2003) Another study found that parents try to protect their children from the physical sensation of hunger, by reducing their own food intake. (Mabli, Cohen, Potter, & Zhao, 2010) However, despite parents' best efforts they may not be able to protect children fully from the effects of household food insecurity. One study found that children are aware of food insecurity in their household and take some responsibility for managing household resources. (Fram et al., 2011)

2.8 Food Banks

Food banks are non-profit, primarily volunteer-run organizations that gather and distribute donated food to those who need it. (Tarasuk, Dachner, & Loopstra, 2014) The rise of food banks in Canada came as a response to the growing problem of food insecurity during the economic recession of the 1980s. (Tarasuk et al., 2014) They were intended as a short-term solution to assist people in a time of economic crises; however, as the government began to cut back on social welfare funding and employment assistance, the need for food banks increased

and instead they became a permanent part of the social welfare system in Canada. (Tarasuk et al., 2014) There are currently more than 4,000 food banks and other food programs in Canada. (Food Banks Canada, 2015)

According to Food Banks Canada (2016), which has been collecting data on food bank usage in Canada since 1999 via the annual Hunger Count Survey, food bank usage continues to rise. In the most recent Hunger Count survey in 2016, 863,492 people received food from a food bank during a period of one month, which was 28% higher than the same time period in 2008 and 1.3% higher than in 2015. (Food Banks Canada, 2016) In Alberta, the increase in food bank usage from 2015 to 2016 was more than 17%, reflecting the poor economic conditions of the time. (Food Banks Canada, 2016) More than a third of food bank users are children and youth and 40% of users are households with children. (Food Banks Canada, 2016) As with food insecurity, the underlying determinant of food bank usage is poverty as those who cannot afford to purchase food turn to food banks for help. (Food Banks Canada, 2016)

Food bank usage has been used as a proxy indicator for food insecurity, however a number of studies have found that food bank usage is a poor indicator because only 20-25% of food insecure households utilize food banks. (Kirkpatrick & Tarasuk, 2009; Loopstra & Tarasuk, 2015; Loopstra, & Tarasuk, 2012; Rainville & Brink, 2001) Reasons for not accessing food banks among food insecure households may include the unsuitable food options, social stigma, and limited information about food banks. (Loopstra, & Tarasuk, 2012)

Unlike in the United States, there are no publicy funded government-run food assistance programs in Canada, and food banks and similar charitable food programs are the

only publicly available option for those experiencing food shortage in Canada. (Tarasuk et al., 2014) In Canada, the food provided by food banks to clients is primarily obtained through donations from food producers, processors, and retailers or collected through general public donations. (Tarasuk & Eakin, 2005) Much of the food that is donated by the food industry is food that could not otherwise be sold in retail stores, such as damaged or disfigured foods, making food banks a sort of 'second tier' of the food system in Canada, diverting a lot of food that would otherwise end up in landfills. (Tarasuk & Eakin, 2005) This also means that, in general, the food that is donated to food banks is of lesser quality than food that could be found in retail stores and may be lower in nutritional value as well. (Irwin, Ng, Rush, Nguyen, & He, 2007; Tarasuk & Eakin, 2005) If the food insecure rely on food banks for a portion of their food, this may exacerbate their negative health outcomes. This highlights the reality that food banks are not a long-term solution to food insecurity. (Tarasuk, 2005) Food banks may provide some relief to many food insecure households; however, resolving food insecurity was never the original intent of food banks since this type of food charity does not address the underlying social inequalities that lead to food insecurity in the first place. (Loopstra & Tarasuk, 2012)

2.9 Food Insecurity Among Post-Secondary Students

Food insecurity among post-secondary student food bank users remains largely unaddressed in the literature; however, the number of studies on prevalence of food insecurity among post-secondary students is continuing to rise. (Cady, 2014) Food insecurity is an issue for post-secondary students and the number of food banks and food pantries on college campuses has risen dramatically over the last few years. (College and University Food Bank Alliance, 2017) Currently, there are almost 500 food banks on campuses across the United States (College and

University Food Bank Alliance, 2017) and almost every college and university campus in Canada has one as well. (Meal Exchange, 2017) The increase in campus food banks over time might imply rising food insecurity among students; however, it may also be the case that food banks have now become institutionalized on campuses. That is, the expectation now is that every college and university will have a food bank to serve students in need.

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Chapter 3: Paper 1: Food insecurity among post-secondary students in developed countries: A narrative review

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Abstract

Purpose: A narrative review was conducted of the food insecurity literature pertaining to university and college students studying in in Very High Human Development Index countries. It aimed to document food insecurity prevalence, risk factors for and consequences of food insecurity, and food insecurity coping strategies among students.

Methodology: English articles published January 2000 to June 2016 were identified using electronic databases. Quality Assessment Tool for Quantitative Studies assessed study quality.

Findings: Nineteen quantitative and two qualitative studies with 18,450 students conducted in USA (n=12), Australia (n=4), Canada (n=4), and Poland (n=1) were included. Prevalence estimates of food insecurity were 12.7 to 89%. Food insecurity risk factors included being low income, living away from home, or being an ethnic minority (e.g., Indigenous, African American, Hispanic/Latino). Many negative consequences of food insecurity were reported (e.g. reduced academic performance, poor diet quality) and strategies to mitigate food insecurity were numerous (e.g. reducing the number or size of meals, borrowing from friends or relatives).

Originality/Value: This review brings together the existing literature on food insecurity among post-secondary students to allow for a better understanding of the condition in this understudied group. The evidence suggests that for low-income and ethnic minority students studying in wealthy countries, obtaining a post-secondary education might mean enduring years of food insecurity and consequently, suffering a range of negative academic, nutritional and health outcomes. There is the requirement to develop, implement, and evaluate programs to reduce food insecurity in students.

Key words: Universities; Students; Food Supply; Hunger; Food Insecurity

Introduction

Food insecurity is the financial inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other socially unacceptable behaviors), or the uncertainty that one will be able to do so (Anderson, 1990). Living with food insecurity is associated with compromised diet quality (Fram et al., 2015; Kirkpatrick and Tarasuk, 2008) as well as both short- and long-term negative impacts on academic achievement, cognitive function, health, well-being, and social functioning (Ashiabi, 2005; Holben, 2010; Jyoti et al., 2005; Ramsey et al., 2012). Food insecurity exists in low-income households, including households with children, ethnic minority households, and households having their main source of income from government assistance or welfare (Coleman-Jensen et al., 2015; Lindberg et al., 2015; Tarasuk et al., 2014). The food-insecure use various coping strategies to acquire food when they do not have enough money to buy food, such as relying on food charities, budgeting, delaying bill payments, or purchasing food on credit (Bazerghi et al., 2016; Holben, 2010; Kaiser and Hermsen, 2015; Wood et al., 2006).

Attending university or college is now being recognized as a period of life when food insecurity may become an issue for individuals who are experiencing financial stress for a number of reasons: limited earning potential while undertaking academic studies; covering academic expenses (e.g., tuition and compulsory fees) and non-academic expenses (e.g., rent and food) while living on a budget; inadequate student loans; lack of budgeting and cooking skills; and diminished social support as a result of living away from home for perhaps the first time (Authors blinded, 2006; Cady, 2014; Luong, 2010; Silverthorn, 2016). The pervasiveness of

charitable food organizations on campuses in the United States, Canada and Australia also suggests that food insecurity is a salient problem for vulnerable post-secondary education students (College and University Food Bank Alliance, 2017; Clifford, 2015; Silverthorn 2016). Post-secondary students who are food insecure may endure numerous negative impacts of not having sufficient financial resources to ensure a consistent food supply, even if the condition of food insecurity is transient and experienced for only the time required to obtain a degree or diploma (Silverthorn, 2016).

There are few literature reviews about the prevalence of food insecurity, and its causes and outcomes among post-secondary students studying in developed countries. Evidence derived from numerous studies examining the impact of food insecurity on post-secondary students' health, academic and behavioural outcomes is needed to better understand the problem and its urgency. We undertook a narrative review of the contemporary literature pertaining to food insecurity in post-secondary students studying in wealthy, developed countries where food is plentiful. The objectives of this review were to identify the (i) prevalence of post-secondary student food insecurity, (ii) risk factors contributing to student food insecurity, (iii) consequences of food insecurity (e.g., dietary quality and adequacy, health outcomes and academic performance), and (iv) coping strategies for managing food insecurity.

Methods

Search Strategy

A narrative review was chosen to address the research objectives as it allowed for a more diverse inclusion of literature and wider scope of searching than a systematic review

while still applying methodological rigor (Ferrari, 2015). Due to the limited state of the literature on the topic, a narrative review was chosen to ensure all available research as well as grey literature was included; the latter which may be missed in a systematic review (Ferrari, 2015). This narrative review covered studies published between January 2000 and June 2016. It was completed in June 2016. Studies written in English that measured or examined food insecurity in post-secondary students studying in countries that had a Very High Human Development Index rating of 0.8 or greater and would be considered 'developed' countries (United Nations, 2015) were the focus of the review. In order for study results to be comparable we wanted to ensure that study samples were representative of those in similar resource settings. Only the literature pertaining to developed countries was examined because the risk factors for student food insecurity and the outcomes of food insecurity likely vary substantially between developed and developing countries (Global Food Security Index, 2016) The Human Development Index is appropriate for assessing the overall development level of a country as it takes into consideration life expectancy, education and income, not just economic growth and its purpose is to "emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country". (United Nations, 2015)

There were no restrictions on article or study type, thus quantitative, qualitative and mixed methods research studies were eligible for inclusion. A student was defined as anyone attending a post-secondary diploma or degree granting institution, whether a college or university. We excluded studies of students who were attending technical or trade schools to ensure that the results would represent students in similar life circumstances. Publications were excluded from this review if they were not full text manuscripts (e.g., conference

abstracts were excluded).

To obtain articles, electronic searches were performed using PubMed, EBSCO, Scopus, MEDLINE, ERIC, CINAHL, and Embase. The gray literature was searched using Google Scholar and ProQuest Dissertations. Reference lists from key articles that were identified through the electronic databases and gray literature search were reviewed for additional studies. The literature search was conducted using MeSH headings and additional keywords to locate articles indexed from January 2000 to June 2016. The search strategy for each database was developed in consultation with team members and a research librarian at the University of [location blinded]. Headings were tailored to each database to ensure specificity and sensitivity, and to capture the available range of literature. Most headings were comparable between databases and included: Food insecur*, Food insuff*, Food bank, Food secur*, Hunger, Food hamper, Food pantry, Poverty, Post-secondary, College, Universit*, Tertiary, Cegeps, Student.

Data Synthesis

To organize data and compare study findings, the following information was extracted and synthesized for each study: author(s), year of publication, study design, study sample, type of post-secondary institution, country of post-secondary institution, method of food security determination, prevalence of food insecurity, and study limitations. Two individuals (blinded) conducted data extraction and synthesis independently in order to minimize bias and maximize rigor. A data extraction table was created to organize data consistently. Results were organized according to our four study objectives.

Quality Assessment

Two individuals independently assessed the quality of quantitative studies using the "Quality Assessment Tool for Quantitative Studies" (Thomas et al., 2004) recommended by the Effective Public Health Practice Project (EPHHP, 2016). The tool provides an overall quality rating based on six domains (selection bias, study design, confounders, blinding, data collection methods, and withdrawals/drop-outs). Individual ratings were compared to reach consensus on each component before overall study quality was assigned as *strong*, *moderate,* or *weak* according to the criteria of the tool. Where discrepancies existed between ratings, discussions occurred to resolve them. Quality assessment was not performed on the qualitative studies as only two qualitative studies were included in the review which is too few studies to make meaningful conclusions regarding the state of the qualitative literature on the topic.

Results

Included studies and their quality assessment

The search strategy resulted in 833 articles. Of these articles, 21 met inclusion criteria for the review (Figure 1). The included studies were conducted in the USA (n=12), Australia (n=4), Canada (n=4), and Poland (n=1). In total, 18450 students participated across the included studies.

Nineteen (90%) of the 21 included studies were quantitative studies (Abbott et al., 2015; Authors, 2015; Bexely et al., 2013; Bruening et al., 2016; Chaparro et al., 2009; Espinoza, 2013; Freudenberg et al., 2011; Gaines et al., 2014; Gallegos et al., 2014; Gorman, 2014; Hanna, 2014; Hughes et al., 2011; Kaczerska et al., 2014; Koller, 2014; Lin et al., 2013; Maroto et al., 2013; Micevski et al., 2014; Patton-Lopez et al., 2014; Silva et al., 2015). The overall quality

assessment score was 'weak' for all quantitative studies based on the six individual quality domains of the Quality Assessment Tool for Quantitative Studies. Two (10%) of the included studies were qualitative studies that examined student food insecurity through interviews with students (Nugent, 2011; Stewin, 2013). Details of each included study and the research synthesis of the findings are organized by the country where the study occurred in Table 1.

Place Table 1 here

Prevalence of food insecurity

Seventeen studies reported the prevalence of food insecurity among students (Authors, 2015; Bexely et al., 2013; Bruening et al., 2013; Chaparro et al., 2009; Espinoza, 2013; Freudenberg et al., 2011; Gaines et al., 2014; Gallegos et al., 2014; Gorman, 2014; Hanna, 2014; Hughes et al., 2011; Kaczerska et al., 2014; Koller, 2014; Maroto et al., 2013; Micevski et al, 2014; Patton-Lopez et al., 2014; Silva et al., 2015). Food insecurity prevalence varied widely, from 12.7% (Hughes et al., 2011) to 89.6 % (Authors, 2015) (Table 1). Only 53% (n=9) (Authors, 2015; Bruening et al., 2013; Chaparro et al., 2009; Espinoza, 2013; Gaines et al., 2014; Gallegos et al., 2014 Gorman, 2014; Maroto et al., 2013; Patton-Lopez et al., 2014) of the seventeen studies reporting prevalence data used the 18-item, 10-item, or 6-item United States Department of Agriculture Food Security Survey Module (USDA FSSM), which is a validated and reliable measure of food insecurity in developed countries (Bickel et al., 2000). The other 47% (n=8) of studies (Bexely et al., 2013; Freudenberg et al., 2011; Hanna, 2014; Hughes et al., 2011; Kaczerska et al., 2014; Koller, 2014; Micevski et al, 2014; Silva et al., 2015) used non-validated instruments, including individual questions from the USDA FSSM in conjunction with other

questions (n=2), study-specific questions (n=4), or the United States Department of Agriculture Community Food Security Assessment Toolkit (Cohen, 2002) (n=2) which is meant to evaluate indicators of community food security.

Risk factors for food insecurity

Eighteen studies examined correlates associated with food insecurity among post-secondary students (Abbott et al., 2015; Bexely et al., 2013; Bruening et al., 2016; Chaparro et al., 2009; Espinoza, 2013; Freudenberg et al., 2011; Gaines et al., 2015; Gallegos et al., 2014; Gorman, 2014; Hanna, 2014; Hughes et al., 2011; Kaczerska et al., 2014; Koller, 2014, Lin et al., 2013; Maroto et al., 2013; Micevski et al., 2014; Patton-Lopez et al., 2014; Silva et al., 2015). Of the 14 studies that studied income as a correlate of student food insecurity, 13 (93%) found low income to be associated with it (Abbott et al., 2015; Bexely et al., 2013; Bruening et al., 2016; Chaparro et al., 2009; Espinoza, 2013; Freudenberg et al., 2011; Gaines et al., 2015; Gallegos et al., 2014; Hanna, 2014; Hughes et al., 2011; Koller, 2014; Micevski et al., 2014; Patton-Lopez et al., 2014). Seven studies examined if ethnicity/race was associated with food insecurity, with four studies concluding that certain ethnic/racial groups (i.e., African American, Hispanic/Latino and Indigenous) were more likely to be food-insecure (Chaparro et al., 2009; Freudenberg et al., 2011; Gaines et al., 2015; Maroto et al., 2013). Other correlates found to be associated with food insecurity were living away from parents/family (Chaparro et al., 2009; Gaines et al., 2014; Gallegos et al., 2014; Maroto et al., 2014; Micevski et al., 2014); living alone (Gorman, 2014; Hughes et al., 2011; Kaczerska et al., 2014; Maroto et al., 2013); and, reliance on food assistance programs such as food banks, food stamps or food pantries (Freudenberg et al.,

2011; Gaines et al., 2014; Gallegos et al., 2014). As all studies were cross-sectional, only associational data could be derived from them.

Consequences of food insecurity

Diet quality and adequacy

Four studies investigated the association between food insecurity and diet quality using varied methods (Bruening et al., 2016; Gallegos et al., 2014; Kaczerska et al., 2014; Nugent, 2011). In one qualitative study, students reported in interviews that they lacked the necessary finances to maintain an adequate nutritional intake (Nugent, 2011). The study by Gallegos et al. (2014) measured dietary intake using the short answer questions from the Australian National Health Survey. It found that food-insecure students were less likely to consume adequate servings of fruits and vegetables per day compared to their food-secure colleagues. Bruening et al. (2016) found using a survey that food-insecure freshmen (i.e., first year college students) living in dormitories had significantly lower odds than food-secure freshmen living in dormitories of eating breakfast, consuming home-cooked meals, perceiving their off-campus eating habits to be healthy, and receiving food from parents. Kaczerska et al. (2014) showed that food-insecure students in Poland had poorer diet quality than food-secure students. Of Polish students in the study who were at risk of malnutrition (35% of the students), 27.9% were food-insecure. In contrast, of Polish students who were well nourished (65% of the students), 10.6% were food-insecure (Kaczerska et al., 2014). The nutritional status of Polish students was assessed using the Mini Nutritional Assessment, which is designed for nutritional screening of the elderly, not young adults (Bauer et al., 2008). The inconsistent or inappropriate application

of dietary assessment methods across studies means that it is difficult to ascertain how food insecurity impacted diet quality and adequacy. Only associational data could be derived from the cross-sectional qualitative studies.

Health correlates

Six studies examined the association between food insecurity and health among post-secondary students (Bruening et al., 2016, Espinoza, 2013; Gallegos et al., 2014; Hughes et al., 2011; Kaczerska et al., 2014; Patton-Lopez et al., 2014). The study by Kaczerska et al. (2014) found no association between food security status and weight status measured objectively by the researchers using Body Mass Index. Other studies relied on student-reported subjective health data. Food-insecure students were more likely to self-report having fair or poor health (Gallegos et al., 2014; Patton-Lopez et al., 2014) or lower overall health (Hughes et al., 2011) compared to their food-secure peers. Espinoza (2013) indicated that food-insecure students were three times less likely to report having very good health compared to food-secure students. Bruening et al. (2016) focused on mental health and found that students who were food-insecure reported a higher prevalence of depression and anxiety compared to their food-secure peers. Only associational data could be derived from these studies, so it cannot be ascertained if food insecurity caused poor health, or vice versa. The qualitative study of Nugent (2011) reported that food-insecure students who were interviewed described a number of health concerns including stress, exhaustion, sleep difficulties, weight loss, and headaches.

Academic performance

Four studies investigated the association between food insecurity and academic performance. Maroto et al. (2013) found that students with a grade point average (GPA) between 2.0 and 2.49 out of 4.0 were more likely to be food-insecure compared to students with a higher GPA between 3.5 and 4.0 out of 4.0. Gallegos et al. (2014) indicated that food-insecure students were more likely to defer university attendance until a later date, as a result of financial problems, and that 23% of food-insecure students compromised/suspended their studies. Silva et al. (2015) found that 58.6% and 87.5% of severely food-insecure students were somewhat to very affected in their ability to attend class and to perform in class, respectively. This same study also found that severely food-insecure students were at a much greater risk of not completing their studies. (Silva et al., 2015) In contrast, Espinoza (2013) found no relationship between academic performance and food security status. The cross-sectional nature of these studies meant that only associational data could be derived from them.

Coping Strategies to Manage Food Insecurity

Nine studies identified fifteen different coping strategies used by students to deal with food insecurity, from mild strategies such as budgeting (Authors, 2015; Hughes et al., 2011) to severe strategies such as stealing money or food (Authors, 2015; Espinoza, 2013; Hughes et al., 2011). Students coped with their lack of food or money to buy food by relying on six types of food management strategies (Authors, 2015; Espinoza, 2013; Hanna, 2014; Hughes et al., 2011; Nugent, 2011), six types of income management strategies (Authors, 2015; Gaines et al., 2014; Hughes et al., 2011; Nugent, 2011) and three types of social and community support strategies (Abbott et al., 2015; Authors, 2015; Espinoza, 2013; Gaines et al., 2014; Gallegos et al., 2014;

Hughes et al., 2011; Koller, 2014; Nugent, 2011). Examples of the different food insecurity coping strategies used by post-secondary students are provided in Table 2.

Place Table 2 here

Discussion

Food insecurity is a remarkable problem for post-secondary students in the developed countries (Australia, Canada, the United States and Poland) included in this review, with up to 89% of the participant population being affected in some of the studies. There were various risk factors for food insecurity examined in the studies, with low income being the most commonly reported, but also including living away from home and being an ethnic minority, specifically of African American, Hispanic or Indigenous descent. In addition to identifying potential risk factors for food insecurity, this review highlighted some of the potentially negative consequences of food insecurity including lower academic performance and reduced diet quality. This review also found that students employ a range of coping strategies to help ameliorate the effects of food insecurity including reducing the number or size of meals and using food assistance programs such as food pantries or food banks. The use of severe coping strategies by some students such as stealing food highlights the desperation that some students experience when food insecure and the lengths to which they will go to manage their food insecurity. Overall, our findings from this review shed important light on a range of issues that have relevance to understanding and managing food insecurity in post-secondary students.

Most studies in the review that measured food insecurity found the prevalence of food insecurity to be higher among students than in the general population of the country where

they were receiving their education (FAO, 2016). The data on the prevalence of student food insecurity is difficult to directly compare across studies as there were a variety of different methods used to measure food insecurity. The use of non-validated instruments in some studies means that the same food security constructs were not being measured across all studies, and calls into question the accuracy of the prevalence estimates derived from studies that did not use the USDA FSSM (Jones et al., 2013). However, the prevalence estimates in studies using the validated USDA FSSM highlight that the problem of food insecurity among students is of sufficient magnitude to warrant closer examination.

The broader food insecurity literature from high-income countries reports a higher prevalence of food insecurity among low income groups (Coleman-Jensen et al., 2015; Tarasuk et al., 2014). Similarly, being low-income was associated with food security among post-secondary students in several studies included in our review. In the United States, the cost of tuition has risen dramatically in recent years, and often exceeds the rate of inflation (Mitchell, 2015). Due to declining public funding for post-secondary education, tuition and compulsory fee increases in Canada have become a widespread strategy to cover university-operating revenues; consequently, students from low- and middle-income households are likely most vulnerable to food insecurity (Burley, 2016). In Australia, government investment in tertiary education has declined while low income students' share of domestic undergraduate enrolment has increased (Kemp and Norton, 2014). Given reduced government funding for post-secondary education, low-income students obtaining a post-secondary education in wealthy countries may endure years of food insecurity.

In the general population, the food insecure are at higher risk for the development of chronic disease, and having poor disease management (Holben, 2010; Ramsey et al., 2012). Children and adolescents experiencing food insecurity have poorer academic performance and negative health consequences compared to their food-secure peers (Alaimo et al., 2001; Jyoti et al., 2005). Similarly, in our review, experiencing food insecurity was often associated with negative impacts on students` academic performance, diet and health. Studies published since our review support our findings. Silverthorn (2016) indicated that among food-insecure Canadian students, 23.7% reported that their physical health was affected, 20.1% reported that their mental health was affected and 49.5% reported that they had to sacrifice buying healthy food to pay for expenses such as rent, tuition and textbooks. A study by (Authors, 2017) found that severely food-insecure students using a food bank located on a Canadian campus consumed fewer daily servings of dairy, fruit and vegetables as compared to students using the food bank that had more moderate food insecurity. Although post-secondary students may only experience food insecurity for the duration of their studies the negative consequences associated with it could potentially have long-lasting effects. For example, the study by Silva et al. (2015) found that food-insecure students were at a greater risk for failing a course or not completing their studies entirely, which may have a long-term effect on the earning potential of these students and possibly contribute to a cycle of food insecurity and poor health in the future.

Many of the coping strategies reported by food-insecure post-secondary students are similar to those reported in the broader food insecurity literature (Kempson et al., 2003; Rainville and Brink, 2002; Wood et al., 2006). Long-term use of coping strategies such as

skipping meals or reducing the quality of food consumed might lead to nutritional deficiencies and health complications, which could jeopardize students' academic performance and degree or diploma completion rate. Other strategies used by students to cope with food insecurity such as buying food with credit cards could make food insecurity more severe by increasing debt (Robb and Pinto, 2010). Some students in our review reported coping with food insecurity by relying on charitable food assistance programs to alleviate food insecurity, which may be an act of desperation when other coping strategies have failed to meet food needs. Organizations such as food banks do not address the root causes of food insecurity and are unable to meet the long-term nutritional needs of the food-insecure (Pettes et al., 2016).

Limitations of included studies

Our quality assessment showed that only quantitative studies with weak designs have been conducted thus far on the topic. This limits our ability to draw conclusions regarding the prevalence of food insecurity among post-secondary students in developed countries as research of stronger quality is required, such as research using large samples of randomly derived students. In terms of the included studies, most used convenience sampling, which likely introduced bias and limited the generalizability of the findings. Since all of the quantitative studies were cross-sectional in nature, causal associations could not be drawn from the data (Greenhalgh, 1997). Almost half of studies measuring food insecurity did not use a validated instrument. Additionally, the majority of the studies did not deeply examine the reasons for food insecurity, or the impact of food insecurity or food insecurity coping strategies on academic achievements, diet, health or well-being. As we did not perform quality

assessment on the qualitative studies included, we cannot conclude with certainty that the findings of those studies are dependable or transferable beyond the studies themselves.

Conclusions and Future Directions

Based on the small number of studies included in this review and their narrow geographic scope, little attention has been paid to understanding and describing food insecurity among -secondary students studying in very high human development countries. Our literature search did not return any studies conducted in high-income countries in Europe, Asia, Africa or Latin America, which demonstrates a lack of research about post-secondary student food insecurity in these regions. The superficial examination of food insecurity in studies included in this review prevented us from gaining a comprehensive understanding of the problem and highlights the need for future research to document whether student food insecurity is an issue of concern in a diversity of economically advantaged counties, and to identify and explore the scope of food insecurity and its causes and consequences in different groups of students. Particularly, longitudinal studies, studies using validated tools to measure food insecurity, qualitative studies, and studies with large samples of randomly derived participants are required to provide a clear picture of the long-term consequences of food insecurity on post-secondary students' health, dietary intake and academic performance. Post-secondary institutions need to focus on responding to the root causes of the issue of student food insecurity as it could be a barrier to students' academic achievement and well-being. Therefore, research with relevant stakeholders (*e.g.,* students, government representatives, food bank staff, university administrators) would be valuable in helping to develop, implement, and evaluate approaches designed to reduce food insecurity in post-secondary students.

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Figure 1. Overview of systematic search strategy

Table 1: Findings and quality assessment of studies from a narrative review of food insecurity among post-secondary students

Author(s), Study Year; Country	Sample Size	Setting (n)	Study Design	Food Insecurity Assessment Tool	Prevalence of Food Insecurity*	Limitations	Quality Assessment Score**
Bruening et al. 2016; US (Arizona)	n=209	University (n=1)	Cross-sectional; quantitative	Adapted US HFSSM	32% to 37%	Selection bias; only freshman living in residence	Weak
Chaparro et al., 2009; US (Hawaii)	n=441	University (n=1)	Cross-sectional; quantitative	10-item HFSSM, demographic and spending variables	21%	Selection bias	Weak
Espinoza, 2013; US (California)	n=597	University (n=1)	Cross-sectional; quantitative	Food security status using 10-item AFSSM	30.6%	Selection bias	Weak
Freudenberg e et al., 2011; US (New York)	n=1,086	University (n=1)	Cross-sectional; quantitative	4-study specific questions about food insecurity	61.9%	Selection bias; used questions derived from the USDA FSSM rather than the validated tool	Weak
Gaines et al., 2014; US (Alabama)	n=557	University (n=1)	Cross-sectional; quantitative	10-item AFSSM, demographic	36%	Selection bias	Weak
Gorman, 2014; US (Ohio)	n=298	University (n=1)	Cross-sectional; quantitative	Food security status using 10-item AFSSM	49.7%	Selection bias	Weak
Hanna, 2014; US (California)	n=67	University (n=1)	Cross-sectional; quantitative	Modified USDA Community Food	19.4%	Selection bias, did not specify the tool used to	Weak

				Security Assessment Toolkit		measure food insecurity	
Koller, 2014; US (Ohio)	n=53	University (n=1)	Cross-sectional; quantitative	Food insecurity using USDA definition and other study specific questions	19%	Selection bias; used several questions derived from the USDA FSSM rather than the validated tool; small sample size	Weak
Lin et al., 2013; US (Texas)	n=112	University (n=1)	Cross-sectional; quantitative	A dichotomous study specific question defined food security status	n/a	Selection bias; used only one not validated dichotomous question to define food security status	Weak
Maroto et al., 2013; US (Maryland)	n=301	Community College (n=2)	Cross-sectional; quantitative	10-item AFSSM	56%	Selection bias	Weak
Patton-López et al., 2014; US (Oregon)	n=354	University (n=1)	Cross-sectional; quantitative	6-item FSSM	59%	Selection bias; severity of food insecurity not measured	Weak
Silva et al. 2015; US (Massachusetts)	n=390	University (n=1)	Cross-sectional; quantitative	32-item survey containing a few questions about food security adapted from the USDA definitions	33.8%	Selection bias; not validated food security measurement tool	Weak

Bexely et al., 2013; Australia	n=11,761	University (n=37)	Cross-sectional; quantitative	One study-specific statement: "I regularly go without food or other necessities because I cannot afford them."	18.2%	Sampling bias; lack of validated food security tool used	Weak
Gallegos et al., 2014; Australia	n=810	University (n=1)	Cross-sectional; quantitative	18-item FSSM	25.5%	Selection bias	Weak
Hughes et al., 2011; Australia	n=399	University (n=1)	Cross-sectional; quantitative	USDA Community Food Security Assessment Toolkit and included the single-item question from the Australian National Nutrition Survey	12.7% to 46.5%	Selection bias; not validated food security measurement tool	Weak
Micevski et al., 2014; Australia	n=124	University (n=1)	Cross-sectional; quantitative	Food insecurity using USDA definition, included some questions from the AFSSM	48%	Selection bias; used several questions derived from the USDA AFSSM rather than the validated tool	Weak
Abbott et al., 2015; Canada	n=22	University (n=1)	Cross-sectional; quantitative	Barriers to food security, reason for using the food bank, socio-demographic characteristics	n/a	Selection bias; did not measure food security status directly; used food bank usage as a	Weak

						rough indicator of food insecurity.	
Authors blinded, 2015; Canada	n=58	University (n=1)	Cross-sectional; quantitative	USDA AFSSM	89.6%	Sampling bias; participants recruited from campus food bank	Weak
Nugent, 2011; Canada	n=15	University (n=1)	Qualitative study	Food insecurity assumed by use of food bank	n/a	Food security status was not reported	n/a
Stewin, 2013; Canada	n=32	University (n=2)	Qualitative study	Experiences with food insecurity, food availability, accessibility and preferences	n/a	Did not describe assessment tool for measuring food insecurity and food security status was not confirmed.	n/a
Kaczerska et al., 2014; Poland	n=764	University (n=7)	Cross-sectional	11-point (modified) questionnaire for food security based on the USDA HFSSM	16.6%	Selection bias; not validated food security measurement tool or dietary assessment instrument	Weak

* Note: Terminology used to assess food insecurity and methods of assessing food insecurity were variable across studies

** Effective Public Health Practice Project's Quality Assessment Tool for Quantitative Studies (Thomas et al., 2004).

Table 2: Strategies used by post-secondary students to cope with food insecurity

Food Management	Income Management	Social and Community Support
• Reduce the number or size of meals (Hanna, 2014; Nugent, 2011) • Skip meals (Hanna, 2014) • Not eat balanced meals (Hanna, 2014) • Buy less expensive food (Authors blinded, 2015) • Not eat for a whole day or fasting (Hanna, 2014) • Steal food (Espinoza, 2013; Authors blinded, 2015; Hughes et al., 2011)	• Buy food on credit (Gaines et al., 2014) • Increase number of hours of employment (Hughes et al., 2011; Nugent, 2011) • Budget (Authors blinded, 2015; Hughes et al., 2011) • Delay bill payments (Authors blinded, 2015; Nugent, 2011) • Reduce personal expenditures(Authors blinded, 2015; Nugent, 2011) • Apply for government support (e.g., loans, bursaries) (Authors blinded, 2015; Gaines et al., 2014)	• Borrow money or food from friends or relatives (Abbott et al., 2015; Espinoza, 2013; Authors blinded, 2015; Hughes et al., 2011; Nugent, 2011) • Use food banks/pantries and other food assistance programs (Espinoza, 2013; Authors blinded, 2015; Gaines et al., 2014; Gallegos et al., 2014; Hughes et al., 2011; Koller, 2014) • Live with parents (Hughes et al., 2011)

Chapter 4: Methodology for Qualitative Research Study

4.1 Study Design

A qualitative study of post-secondary students with children receiving food hampers from the Campus Food Bank (CFB) at the University of Alberta was conducted to explore students' experience with food insecurity. A qualitative descriptive study was completed, which is an appropriate design since little research has been done on the topic of food insecurity in this student population. (Sandelowski, 2000) Specifically, qualitative description allows for a "comprehensive summary of events in the everyday terms of those events", which requires staying "closer to the surface of the words and events" without assigning or developing theory. (Sandelowski, 2000) Qualitative descriptive studies are appropriate when the goal of the research is to provide factual responses to who, how, and why questions in health research (Colorafi and Evans, 2016) and to explore a topic using naturalistic inquiry without the application of a stringent theoretical lens. (Sandelowski, 2000) Due to the breadth of issues queried, the qualitative data is presented as two separate manuscripts. The first manuscript explores data relating to objectives 1-5 while the second manuscript explores data relating to objectives 6-8.

4.2 Setting

In 1991, the CFB at the University of Alberta was the first food bank to be established on a post-secondary campus in Canada. It was established in response to a perceived growing need for a charitable food source on campus. (Campus Food Bank [CFB], 2016) The CFB distributes food hampers to members of the campus community including students, staff, alumni and their

children. (CFB, 2016) In 2016, the CFB served 2,500 individuals, which included adults (“67%” of 2500), children (“27%” of 2,500) and infants (“6%” of 2,500). (CFB, 2016)

At the time of the qualitative study (September 2013 through April 2014), four days of food was provided in hampers. (CFB, 2016) Hampers are not designed to meet all the requirements of a healthy diet, but they are modeled on the Eating Well with Canada’s Food Guide. Hampers can be requested once every 2 weeks and generally require one business days’ notice to prepare. A sample food hamper can be found in Appendix 1. Food hampers include non-perishable foods such as canned meat, vegetables, rice and cereal, as well as perishable foods such as eggs, fruit and vegetables, if available. Clients also receive a coupon for 1 litre of milk, which can be redeemed at a store on campus. Clients with children also receive peanut butter and can request infant formula if it is available at the time of hamper pickup. Some toiletry items (toilet paper, shampoo, diapers, etc.) are also available on request.

This study was conducted as part of a larger program of research related to food insecurity in post-secondary students, which included both quantitative and qualitative studies on post-secondary student food bank clients. (Farahbakhsh, Ball, Farmer, Maximova, Hanbazaza, & Willows, 2015; Farahbakhsh, Hanbazaza, Ball, Farmer, Maximova, & Willows, 2017; Hanbazaza, Ball, Farmer, Maximova, & Willows, 2016)

4.3 Participants

All participants included in the present qualitative study were a subset of University of Alberta students with one or more children < 18-years-old in their care who had previously participated in a larger quantitative study of food insecurity among student clients of the

UAlberta CFB that took place between 2013-2014. (Farabakhsh, 2015) This larger study included a quantitative survey of food security status using the validated 10-item Adult Food Security Survey Module (AFSSM). (Bickel, Nord, Price, Hamilton, & Cook, 2000) Qualitative study participants had been verified as food insecure based on their responses to the AFSSM and had used the food bank on campus at least once in the year prior to this study.

4.4 Recruitment

Purposive sampling was used to select participants from the larger quantitative study to provide data on the topic by focusing on the perspectives of those who experienced food insecurity. (Mayan, 2009) Inclusion criteria for the current study was such that participants from the larger study: (1) had some level of food insecurity (either moderate or severe) based on responses to the validated AFSSM (Bickel et al., 2000) and (2) had 1 or more children under the age of 18 in their care and (3) had used the Campus Food Bank at least once in the past.

Recruitment for the study began September 2013 and continued through April 2014. Food insecure students who agreed to be contacted for future research upon completion of the larger quantitative food insecurity survey were recruited for face-to-face interviews using the email address they provided. The researcher contacted eligible students by email sequentially after their participation in the quantitative study. An invitation letter was emailed to eligible students, which explained the purpose of the study and included an information sheet and consent form as attachments. (Appendix 4) If students agreed to participate in the study, the researcher worked with them to find a mutually convenient time and date to meet for the interview on the UAlberta campus. The goal was to continue recruitment until data saturation was reached, meaning that no new categories emerged from the data and further data

collections would add little or no additional information. (Creswell, 2012). In reality, recruitment, and thereby sample size, was limited by the inclusion criteria (i.e., students with children), time constraints and resources. Though it was evident that little new information was emerging after the fifth interview, eligible students who had already agreed to participate were interviewed as the researcher felt that they genuinely desired to participate in the research and because the necessary resources were available to conduct further interviews.

4.5 Development and Pilot Testing of Tools

Data were collected using a short quantitative survey followed by a semi-structured interview using an interview guide. Survey questions collected demographic and educational information and confirmed the food insecurity status of participants. (Appendix 2) The survey questions were derived from the long survey that was administered as part of the preceding quantitative study. (Farabakhsh, 2015) This was done to obtain updated demographic information and to help the researcher gain an understanding of their current food insecurity status.

An interview guide (Appendix 3) was developed to facilitate the flow of the interview and to ensure key issues of interest were addressed. It was developed by the graduate student researcher in conjunction with another graduate student researcher (MH) and two nutrition professors (ND & AF) with expertise in food insecurity. It was subsequently pilot-tested with three graduate students in Nutrition and Metabolism in order to ensure the questions were appropriate and understandable. Based on feedback from the participants during the pilot test, revisions were made to ensure that the questions and instructions were clear and appropriately

captured the objectives of the study. Pilot testing also allowed us to gauge how much time each interview would take.

4.6 Data Collection

Data collection occurred in a private room in the Edmonton Clinic Health Academy (ECHA) at the University of Alberta. First, the researcher verbally explained the purpose, procedures, and the risks and benefits of the study. Participants were given a copy of the information sheet (Appendix 4) and given a few minutes to look it over before being asked to complete and sign the consent form (Appendix 4) indicating that they were aware of what the study entailed and agreeing to participate in it. Once this was complete, data collection began.

The semi-structured nature of the interview allowed room for prompting and follow-up questions depending on participants' answers to questions and their willingness to share details. Topics covered during the interview included: (1) reasons for using the CFB, (2) their experience with CFB and food hamper, (3) feelings about using the CFB, (4) the impact of food insecurity on academic performance and both personal and child well-being, (5) coping strategies to help deal with food insecurity, (6) barriers to achieving food security, and (7) suggestions for changes to the CFB services.

The same researcher (SL) conducted each in-person interview, which took participants between 45 and 90 minutes to complete. A sample food bank hamper (Appendix 1) was on display during the interview to allow participants to refer to specific types of foods that they may have received from the CFB and stimulate discussion regarding appropriateness of the food they received for themselves and their children.

All interviews were digitally recorded. Prior to the interview start, digital recorders were checked to ensure they were properly working and fully charged. As an extra measure of caution, two separate recorders were used in case one of them failed, so that there would be a backup recording. Participants were compensated for their time with a $35 grocery store gift card.

4.7 Data Analysis

After data collection, each digitally recorded interview was transcribed verbatim (by SL). A second researcher (MH) reviewed excerpts of a sub-set of recordings and their accompanying transcripts to ensure accuracy and completeness. After verification, transcripts were read (and re-read) (by SL) to increase familiarity with their contents prior to beginning data analysis. All data collection was completed prior to beginning analysis on the transcripts.

Data were analyzed using conventional content analysis as described by Hsieh and Shannon (2005). Content analysis has many applications and variations, but it allows for surface level description of a phenomenon and is appropriate when existing theory or research literature on a phenomenon is limited. (Hsieh & Shannon, 2005) Rather than imposing preconceived categories onto the data, it allowed for the naming of categories from the data itself. (Hsieh & Shannon, 2005)

Transcripts were read and colour codes were created to help place codes into different categories and sub-categories. This was completed using line-by-line analysis of the transcripts to ensure analysis was thorough and complete as well as through comparison to previously created codes to ensure each category was mutually exclusive. (Hsieh & Shannon 2005) Key

words and phrases that embodied the emerging categories were highlighted and sub-categories were created as needed.

To enhance validity, a second researcher reviewed a sub-set of the initially coded transcripts and categories. Subsequently, categories and sub-categories were discussed throughout the analysis process with the research team to ensure there was agreement on naming and placing of codes into correct categories and to ensure categories were distinct and separate. (Mayan, 2009) After categories were agreed upon, a conceptual framework (Appendix 6) was developed in consultation with the research team to capture all the categories and sub-categories that emerged from the data. This framework was used to guide the discussion of results and the connections among different categories.

4.8 Rigour

In qualitative research, it is important to ensure the study produces trustworthy and authentic data. (Colorafi & Evans, 2016; Lincoln & Guba, 1985) According to Colorafi & Evans (2016), there are five concepts that contribute to rigour in a qualitative study: objectivity, dependability, credibility, transferability, and application.

Objectivity is the relative freedom from researcher bias in the research process to ensure that results reflect the perspectives of participants. (Colorafi & Evans, 2016) The objectivity of the study was enhanced by describing in detail the study methods from recruitment through to data analysis as to be held accountable for the methodology used. Also, the interviews were digitally recorded and transcribed verbatim to ensure participants' original words were retained and could be reported in the results as quotes.

Dependability is the consistency in research procedures from participant to participant. (Colorafi & Evans, 2016) Through the use of a semi-structured interview guide, which was prepared and pilot-tested in advance with experienced researchers, the dependability of the study was increased.

Credibility refers to the 'truth value' of the findings and whether or not they make sense. (Colorafi & Evans, 2016) This was accomplished by verifying and amending coding throughout the research process with other researchers and providing accounts of the data using the participants' own words.

Transferability is similar to external validity, in which the findings of the study transfer or hold meaning in other settings, which includes an aspect of generalizability. (Colorafi & Evans, 2016) This was accomplished by providing a thorough description of the study participants so that they can be compared to those in other studies. We used purposive sampling to obtain rich information specific to the objectives of the study, so the results cannot be generalizable to the whole population; however, by labelling the specific techniques used, we aimed to identify issues in the sample and setting that may limit generalizability to populations outside that setting. For example, the results may not be transferable to those who do not use a food bank nor are post-secondary students. Through the research process, we also identified areas in need of further exploration, by other researchers, to help enhance transferability.

Application refers to how the findings of the study are applicable to the realities faced by the participants themselves and other consumers of the information. (Colorafi & Evans,

2016) While the results of the study in and of itself may not be able to enact application, by producing manuscripts to be submitted for publication in widely accessible journals, and presenting at conferences, we are able to ensure the results are made available to a wider audience. As others are able to access the results of the study, there is the potential that the information can be utilized to promote policy discussion about student funding and the issue of food insecurity among post-secondary students, ultimately leading to solutions for the students themselves.

4.9 Ethical Considerations

This study received ethics approval from the Human Research Ethics Board at the University of Alberta and was also approved by the CFB Board of Directors and Executive Director at the University of Alberta.

In order to ensure confidentially of participant information and results, immediately after each interview occurred, audio files were transferred to a password-protected computer and named without identifying information. Each participant was assigned an ID number and the connection between ID number and participant information was stored separately in a password-protected document. All other interview materials were kept in a locked-filing cabinet only accessible by the research team with all identifying information removed. Consistent with HREB guidelines, this information will be destroyed five years after the completion of the study.

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Chapter 5: Results

Given the depth and breadth of issues that were explored in the interviews, we decided to organize the data from the qualitative study into two independent, but related manuscripts. In the first paper (Chapter 6), data that addressed objectives 1-5 were included. For the second paper (Chapter 7), information that related to objectives 6-8 was included. For both manuscripts, a qualitative conceptual framework was developed to elucidate the connections between the various categories and sub-categories that emerged from the research. (Appendix 6) The results, summary and discussion that relate to the aforementioned objectives are included in the following two manuscripts, both of which have been submitted for publication to peer-review journals.

Chapter 6: Qualitative Paper 2: Sometimes you cannot study well when you are hungry and you cannot study well when you always worry: A qualitative exploration of food insecurity among post-secondary students

Lee, S., Ball, G.D., Farmer, A, & Willows, N.D.

This manuscript was formatted for submission to the Canadian Food Studies Journal. The style of Qualitative Paper 2 is according to the journal requirements.

Title: *Sometimes you cannot study well when you are hungry and you cannot study well when you always worry*: A qualitative exploration of food insecurity among post-secondary food bank student clients

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Abstract (250 word limit)

Background: Campus food banks have proliferated in response to student food insecurity. Students caring for children may be particularly vulnerable to this condition.

Objectives: The objectives of this qualitative study were to explore students' reasons for using the campus food bank, students' feelings about using the campus food bank; the impact of food insecurity on the quality of students' academic experience and achievement, the impact of food insecurity on the wellbeing of students; and the barriers to overcoming food insecurity.

Methods: A qualitative study used semi-structured interviews to explore food insecurity among nine student caregivers who accessed the University of Alberta food bank. Transcripts underwent content analysis.

Results: Findings were organized into themes: reasons why students used the food bank; feelings about using the food bank; the consequences of food insecurity for students; and, barriers to students of overcoming food insecurity. The primary impetus for food bank use was in response to a financial crisis that left students with insufficient funds to buy food such as loss of income, shortage in student loan funding, and unexpected bills. Students felt embarrassment, shame or conflicted feelings such as guilt about receiving food hampers. Students experienced negative effects on academic outcomes as well as on mental and social wellbeing.

Discussion: Food insecure post-secondary students with children experience of myriad of negative outcomes, which may impact their ability to succeed in their studies. To prevent food insecurity, students caring for children require better emergency support funding, increased

scholarship and bursary opportunities, subsidized childcare, and enhanced availability of high quality food on campus.

Key words: Food insecurity, food banks, students, university

Introduction

In countries like Canada that have highly developed economies, food insecurity occurs among individuals who have inadequate or insecure access to food mostly because of financial constraints (Tarasuk, Mitchell, & Dachner, 2016). Food insecurity is a serious public health problem because it negatively impacts physical, mental, and social health considerably (Ashiabi, 2005; Holben, 2010; McLeod, & Veal, 2006). It may also compromise the academic potential of children and adolescents attending primary or secondary school, and adults enrolled in post-secondary institutions such as colleges and universities (Alaimo, Olson, & Frongillo, 2001; Gallegos et al., 2014; Jyoti, Frongillo, & Jones, 2005). Food-insecure individuals utilize a variety of coping strategies to help manage food resources and mitigate the negative consequences of food insecurity, including accessing charitable food programs, such as food banks or food pantries (Bazerghi et al, 2016; Holben, 2010; Kaiser, & Hermsen, 2015; Wood et al., 2006).

In Canada, food banks emerged during the 1980's as a way to help individuals cope with the problem of food insecurity during a time of economic recession (Tarasuk, Dachner, & Loopstra, 2014). They were intended as a short-term solution to assist people experiencing an economic crisis; however, due to cuts to social welfare funding and employment assistance, the need for food banks increased and they became a permanent part of the social welfare system (Tarasuk et al., 2014). While food banks may provide some temporary relief from hunger, they are not intended as a long-term solution for food insecurity and they do not address the underlying social inequalities that lead to food insecurity (Loopstra, & Tarasuk, 2012; Tarasuk, 2005). Despite these limitations, in the 1990s universities and colleges across Canada began to operate charitable food distribution programs to help students who were struggling with food

insecurity to cope with this reality. By 2016, at least 104 university and college campuses across Canada had hunger relief programs including food banks (Silverthorn, 2016).

The institutionalization of food banks on post-secondary institutions in Canada is partially in response to declining public funding for post-secondary education resulting in dramatic tuition and compulsory fee increases required to cover operating revenues (Burley, 2016). In Canada, international students, student parents, and those in professional programs are especially vulnerable to food insecurity; however, the evidence suggests that in some cases fewer than 10 percent of students who are food insecure use a food bank or hunger relief program in order to have enough to eat (Silverthorn 2016; Entz et al., 2017). Similarly, in the general population, only 20-25% of food insecure households utilize food banks (Kirkpatrick & Tarasuk, 2008; Loopstra & Tarasuk, 2015; Loopstra, & Tarasuk, 2012; Rainville & Brink, 2001). Reasons for not accessing food banks include the unsuitable food options, social stigma, and limited information about food banks (Loopstra, & Tarasuk, 2012).

Food bank use by students is an emergent issue considering the increasing number of them located on campuses. Examination of this issue will provide information that can be used by university and college administrators, student services, and provincial and federal government policy-makers to develop policy and programs to ensure that food-insecure students have the financial and other resources necessary to succeed in their studies (Entz, Slater, & Desmarais, 2017). In particular, qualitative research is needed to understand and explore the causes and consequences of food insecurity among students caring for children who utilize campus food bank services, and to understand their perceptions of these food programs. In Canada it is estimated that student parents comprise about 17% of college

students and 11% of university students (Lero, Smit Quosai, & van Rhijin, 2007). These student caregivers are at high risk for food insecurity given the double financial burden of having expenses associated with both child-rearing and obtaining a post-secondary education (Silverthorn, 2016).

We undertook a qualitative descriptive study of students caring for children who were clients of the Campus Food Bank (CFB) Society at the University of Alberta in Edmonton. Founded in 1991, the CFB was one of the first food banks at a post-secondary educational institution in Canada. It is a registered charity operated by the Students' Union, which distributes food hampers and toiletries to students, staff, alumni and their children. The CFB is governed by a Board of Directors that represents the diversity of the University Community. Research by our group indicated that ~17% of students using CFB services have at least one child in their care. Of student caregivers using the CFB, the majority are female, Canadian citizens, living with another adult, and enrolled in an undergraduate degree (Authors, 2016).

The objectives of our qualitative research with post-secondary students with children using the CFB were to: 1) explore their reasons for using the services of the food bank; 2) describe their feelings about using the food bank; 3) explore the impact of food insecurity on the quality of their academic experience and achievement; 4) explore the impact of food insecurity on wellbeing; and, 5) understand the barriers to overcoming food insecurity.

Methods

Design

We conducted a qualitative descriptive study of post-secondary students with children who accessed a university-based food bank. As described by Sandelowski (2000) this allowed for a "comprehensive summary of events in the everyday terms of those events" which required "staying close to the surface of the words and events" without assigning or developing theory.

Setting

The CFB provided food hampers to student parents that were designed to provide a 4-day supply of food. Food hampers could only be requested once every 2 weeks. The quantity of food provided was based on the number of people in the household. Food hampers included non-perishable foods such as canned meat, vegetables, rice and cereal, as well as cultural and perishable foods such as eggs, fruit and vegetables, if available. Peanut butter was provided for children. Students received a coupon for 1 litre of milk, which could be redeemed at a store on campus. Students could request infant formula and diapers if they were available. Though hampers were modeled after *Eating Well with Canada's Food Guide*, they were not intended to meet all the requirements of a healthy diet.

Participants

Recruitment of students began September 2013 and continued through April 2014. Purposive sampling was used to focus on the perspectives of those with rich data on the topic (Mayan, 2009). All participants had taken part in an earlier quantitative study of food insecurity among student clients of the CFB (Authors, 2015; Authors, 2016) and had indicated their willingness to participate in an in-depth interview about food insecurity. As part of the

quantitative study they had completed the validated 10-item Adult Food Security Survey Module (Bickel, Nord, Price, Hamilton, & Cook, 2000). Inclusion criteria for participation in the qualitative study was that (1) the students had been confirmed as food insecure, (2) had one or more children (<18 years old) in their care, and, (3) had used the food bank on the University of [blinded] campus at least once in the previous year. Interested students who met the inclusion criteria were contacted by email to participate in interviews.

Data Collection

Semi-structured interviews were conducted in private. An interview guide that included prompting questions was used to ensure key issues of interest were addressed (Table 1). The guide was developed by the research team, which included two nutrition professors with expertise in food insecurity, and pilot-tested with three graduate students studying nutrition at [blinded] to ensure the questions were appropriate and understandable and adequately captured the objectives of the study.

[Insert Table 1 here.]

A sample food bank hamper was on display during the interview. It allowed participants to refer to specific foods which they may have received from the food bank and it also helped to stimulate discussion regarding the food they received. Interviews were recorded using a digital audio recorder and transcribed verbatim into electronic format by the researcher. A second researcher reviewed excerpts of a subset of transcripts and their accompanying recordings, which indicated that the transcripts were accurate and reliable.

Informed written consent was obtained prior to the interviews and participants were compensated for their time with a $35 (Canadian dollars) gift card to a local grocery store. The research study was approved by the Health Research Ethics Board at [blinded].

Data Analysis

Data were analyzed using conventional content analysis as described by Hsieh and Shannon (2005). This allowed for surface level description of a phenomenon which is appropriate when existing theory or research literature on a phenomenon is limited. Rather than imposing preconceived categories onto the data, it allowed for the naming of categories from the data itself. (Hsieh & Shannon, 2005)

Transcripts were colour coded to help place them into categories and eventually themes. This was completed using line-by-line analysis of the transcripts to ensure analysis was thorough and complete as well as through constant comparison to previously created codes. (Hsieh & Shannon 2005) To enhance validity, a second researcher reviewed a sub-set of the initially coded transcripts and the categories. Subsequently, themes, categories and sub-categories were discussed with the research team to ensure there was agreement on naming and placing of codes into correct categories and to ensure themes and categories were distinct and separate. (Mayan, 2009) Frequency data related to each category were tabulated. A conceptual framework was developed that integrated the findings of the present study with our previous qualitative work with these student-parents (Authors, 2017).

Results

Participant characteristics

Nine participants (n=5 male and n=4 female) were interviewed. All were full-time post-secondary students who had 1 (n=7) or 2 children (n=2) in their care. Participants included graduate (n=4) and undergraduate students (n=5) and international (n=4) and domestic students (n=5).

Emergent themes

Themes which emerged from the data were: reasons why students used the food bank; feelings about getting food from the food bank; the consequences of food insecurity for students; and, barriers to overcoming food insecurity. Each theme had categories, some which were further subdivided into subcategories. A summary of themes, categories, and subcategories is discussed in detail below.

Theme: Reasons for using the CFB

Category: Reaction to financial crisis/hardship

Almost all students (n=8) responded that when they first decided to ask for food hampers from the CFB it was in reaction to a financial crisis or hardship that was unanticipated and left them with little money to cover their expenses, including the purchasing of food. The types of crises that precipitated the need to seek food charity varied widely among students and included loss of source of income including scholarship support, a shortage in student loan funding, and unexpected bills. For example, Participant #9 discussed that though they tried to budget, the amount of funding provided by student loans/scholarships was simply inadequate to cover their expenses.

> *"I was in a big panic because I was running out of everything, I was figuring out you know what the finances would be like. And I went to see the transition year coordinator… and she said lots of students use it [food bank]. She said basically if you are in university and you are getting student funding you have to be broke to get student funding. And they don't like to get over and above extra you know you get penalized for having more so she said everybody uses the food bank.* (Participant # 9)

Participant # 1, indicated the loss of scholarship support by his spouse as the precipitating factor for food bank use, *"My wife just lose her scholarship, we really run out of, ran out of money"* Participant #8 described that he needed to use the food bank after his wife fell ill and the family experienced many unanticipated expenses*, "Because my wife got ill and she was in the hospital and I had a lot of extraordinary expenses for that. I had to pay somebody who would take care of my daughter…and then after she got out of hospital we have also additional expenses for medication."*

Category: Buffering against a future financial crisis

Two participants mentioned that they utilized the food bank to prevent a financial crisis. The food they received in the hampers meant that they could reduce the amount of food they purchased at grocery stores, which prevented them from running out of money. Participant # 5 stated *"If I go there (food bank) it will be a little bit less burden in terms of food to buy."* Similarly, Participant # 6 stated, *"so sometimes if I can supplement maybe for example canned goods that I can get from the food bank then I'd have more money to buy actually like the healthier fresh produce and things like that"*

Theme: Feelings about getting food from CFB

Participants were mixed in their responses to how they felt about asking for and getting food from the CFB. Some had negative feelings about food charity (n = 3), some had conflicted feelings about food charity (n = 3) and some had positive feelings about it (n = 3).Negative feelings mostly stemmed from the social embarrassment and shame associated with being seen at the food bank or having to rely on others for food assistance. Participant # 9 stated, *"When I went to the food bank and she gave me university bags. I was ashamed I didn't want people to see me walking around."* Participant # 2 said, *"I guess I'm a little bit apprehensive when I first went in there and then umm, it was embarrassing having to carry the bags out. I felt a little bit yea ashamed…"* Conflicted feelings about receiving food hampers arose when participants felt guilty that there were other students who could use the services more than themselves, for example as stated by Participant #7 "*There's people and there's families that can use the services more than I can …"* and Participant # 6, *"… sometimes I feel bad like it's supposed to be for like homeless people who have nothing and I feel like maybe I shouldn't be because we still have a little bit of food…"* Positive feelings about using the food bank related to feeling supported by the university. *"I actually feel really great. I really get a lot of support from the university"* (Participant # 1)

Theme: Consequences of food insecurity

Category: Impact of food insecurity on student's academic performance

Students were asked about the impact that a lack of food or money to buy food had on their studies and academic performance. In response to this question, eight students felt that food insecurity had a direct (n=3) or indirect (n=5) negative impact on their studies or academic

performance. Participant # 2 mentioned the challenge of attending class while hungry (" … *if I don't have lunch then in my afternoon classes it's really hard to get through"*). Students mentioned lowered grades and reduced ability to study as the most severe outcome of food insecurity on their academic performance. Participant # 8 said, *"One needs money in order not to think too much about them. That's the thing if you don't have money, if you don't know how you are going to survive the next week or something it's hard to concentrate to study"* Similarly, Participant # 1 expressed*, "Sometimes you cannot study well when you are hungry and you cannot study well when you always worry."*

Category: Impact of food insecurity on mental and social wellbeing

Another category that emerged from the data was the impact of food insecurity on students' wellbeing, both mental (n=6) and social (n=2). The impact of food insecurity on mental wellbeing was due to excessive stress and worry about money for food, or inability to buy food on campus and having to wait until they get home to eat. With respect to social well-being, Participant # 2 discussed the embarrassment of their stomach making noises in class due to hunger while Participant # 5 discussed how a lack of money to buy food impacted his social wellbeing by preventing him from joining on-campus study groups with his peers. He said, *"Most of the students buy the coffee or go to for the lunches or something like that. At least they get the chance to just like do the group study. I couldn't join them because I feel a little bit hesitant just like they will buy and I what should I say? I don't have money? So I avoid them."*

Theme: Barriers to overcoming food insecurity

Participants mentioned lack of time (n =4) (e.g., time required to shop and prepare meals), inaccessibility to food (n=2) (e.g., distance to cheaper stores, lack of transportation) and inadequate knowledge (n=1) (e.g., language barriers, lack of cooking skills) as barriers to overcoming food insecurity. An example of time as a barrier was, *"sometimes we don't have enough time to prepare food at home."* (Participant # 3)

Discussion

Student parents constitute an important portion of college and university populations that deserve attention considering their increased vulnerability for food insecurity. This qualitative study explored the experience of food insecurity among students caring for children who accessed the food bank at the University of Alberta. Students utilized the campus food bank following a financial crisis or to prevent a financial crisis. Students felt shame, embarrassment and guilt about having to ask for food charity. The food insecurity that these students endured had a profound negative impact on their ability to perform academically, negatively impacted their mental well-being, and led to their social isolation from other students.

Student parents expressed concern over the quality of food that they received in the food hampers from the CFB. Some of them were unfamiliar with the food. The food provided by food banks is primarily obtained through donations of food from food producers, processors, and retailers or is collected through general public donations. (Tarasuk & Eakin, 2005) Much of the food that is donated by the food industry could not otherwise be sold in retail stores, such as damaged or disfigured foods, making food banks a sort of "second tier" of the food system in Canada, diverting a lot of food that would otherwise end up in landfills. (Tarasuk & Eakin, 2005)

This means that generally the food that is distributed by food banks is of lesser quality than food found in retail stores and may be lower in nutritional value as well. (Irwin, Ng, Rush, Nguyen, & He, 2007; Tarasuk & Eakin, 2005) Studies conducted on the quality of foods provided for adults by the food bank at the University of Alberta found them to be low in protein and fat from animal sources (Author, & Author 2006; Authors, 2014). The CFB adds peanut butter to hampers provided for children, which would increase their caloric and fat content. Clearly, if food insecure student parents and their children rely on food banks for more than a portion of their food, they may have compromised nutrient intake.

According to the definition of food insecurity given by Anderson (1990), when "the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain" this constitutes food insecurity. Given students' strong negative feelings about accessing the CFB, campus food banks are not a suitable solution to student hunger. Furthermore, food banks fail to address the root causes that necessitate food bank use. (Loopstra, & Tarasuk, 2012). In the present study, students identified the loss of scholarship support and inadequate student loans as reasons for being food insecure. Non-financial barriers identified by students to becoming food secure included a lack of time to prepare food, knowledge limitations on how to prepare food, and limited food accessibility. These findings are similar to those of other Canadian studies. According to Meal Exchange's Hungry for Knowledge report (2016), post-secondary students rank food and housing costs to be the largest contributors to food insecurity, followed by inadequate income supports in the form of student loans and grants, and limited facilities to prepare food (Silverthorn, 2016). One study at the University of Manitoba (Entz et al., 2017) found about 70% of students who identified as food-insecure cited the high cost of food and

lack of time to prepare food as the primary barriers affecting their access to food, with about 62% of students identifying the high cost of tuition. Apart from these, financial barriers such as housing costs, and inadequate financial support in the form of loans or grants were also significant (Entz et al., 2017).

The findings of this research confirm previous research that income inadequacy is the primary contributor to food insecurity in Canada (Howard, & Edge, 2013). A potential solution to the problem of post-secondary student food insecurity would include increased student funding in the form of grants, scholarships and loans. Some progress has been made on this front, as the federal Liberal governments' focus on post-secondary student issues was reflected in their 2016 budget through increased grant funding as an alternative to loans. However, these efforts fail to address the support needed for all students who face shortfalls in funding, especially those in advanced study programs or following non-traditional pathways into education, such as obtaining a post-secondary education after having children. Furthermore, these policies only impact undergraduate students (Snider, 2016).

Conclusions

Despite utilizing the university-based food bank, student parents in the present study were unable to fully mitigate the negative effects of food insecurity including negative effects on their own well-being and academic studies. The results of our study highlighted the fact that campus food banks are not a suitable long-term solution for student food insecurity as negative outcomes of food insecurity persisted with food bank usage. Clearly, the institutionalization and expansion of campus food banks is not the appropriate solution to student food insecurity.

To address food insecurity in the post-secondary student population there is a need to examine student funding opportunities and provide enhanced support for students facing food insecurity, including students caring for children. Post-secondary institutions could provide additional support to student parents through offering better emergency support funding and by increasing scholarship and bursary opportunities for them, providing subsidized childcare options, and by enhancing the availability of high quality food resources through food programs designed specifically for student caregivers. Students would also benefit more from reduced education costs through the lowering or freezing of tuition and mandatory fees.

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Appendices

Table 1. Interview Guide

Reasons for using the Campus Food Bank and the impact of the Food Bank on the student's life

- Think of the first time that you went to the food bank. What happened in your life that made you decide to ask for food from the food bank?
- How did the food hamper you received help you to get enough food to eat?
- If the hamper didn't provide enough to eat, please tell me why not?
- Do you feel that the kinds of foods in the food hampers are appropriate for you? Please explain why or why not.
- Do you feel that the foods in the hampers are appropriate for your children? Please explain why or why not.
- Can you describe your feelings about getting food from the Campus Food Bank?
    - Probe: How does it make you feel to ask for food?
    - Probe: Do you feel OK to get food this way?

The impact of food insecurity on student's education and their children's well-being

- Please describe to me how a lack of food or money for food has influenced the quality of your university experience, including your ability to study.
- How does a lack of food or money for food impact the well-being of your children?

Coping strategies

- Apart from using the Campus Food Bank, what do you do if you run out of food or money to buy food? What would you do if the Campus Food Bank did not exist?

Food related behaviors

- What kind of challenges do you face as a student with children that affect your eating habits?
- How does being a student affect your ability to eat nutritious food?
- Describe how your diet has changed since you started University. (For students who had children before beginning their studies.) OR Describe how your diet has changed as a student since having children. (For students who had children while undertaking their education.)
- How would you describe the nutritional quality of the food that you consume?
- How would you describe the nutritional quality of the food your children consume?
- How would you change what you eat if you could?
- How would you change the food your children eat if you could?
- What is your biggest barrier to eating the types of foods that you want?
- How is food shared between adults and children within your household?

Challenges to achieving food security

- What are some of the challenges you face as a student with children regarding obtaining adequate food?
- What could be done to overcome these challenges?
- What was your food security status prior to beginning your studies?

Suggestions for Change

- What would you suggest could be done to improve your ability to acquire food?
- How would you like to see the services of the Campus Food Bank changed to better meet your needs?

Wrap up Questions

- Is there anything else that you would like to talk about or add that we haven't yet discussed?
- Is there anything else you think is important for me to know?

Chapter 7: Paper 3: Exploring the experience of food insecurity among university students caring for children: A qualitative descriptive study

Lee, S., Ball, G.D., Farmer, A, &Willows, N.D.

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Title: Exploring the experience of food insecurity among university students caring for children: A qualitative descriptive study

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Abstract

Food insecurity impacts the health and well-being of post-secondary students attending university or college. Students may be especially vulnerable to food insecurity if they care for children, but research in this area is limited. The purpose of this qualitative descriptive study was to explore the experience of food insecurity among post-secondary students with children who accessed a university-based food bank. Purposive sampling was used to recruit nine students who cared for at least one child (<18 years old) and had received at least one food hamper the previous year. Students' food insecurity was confirmed from their responses on the 10-item Adult Food Security Survey Module. Transcripts of semi-structured, individual interviews underwent content analysis. Findings indicate that some students felt that the donated food they received was of poor quality or not appropriate for their culture or religion. Students tried to shield their children from the negative effects of food insecurity by sacrificing their own nutrition in times of food shortage, which included giving children higher quality foods, forfeiting food so children could eat, and ensuring children's dietary needs were met before their own. Students used a variety of coping strategies to manage their food insecurity, including accessing food programs, reducing the quality of food they ate, and borrowing money to purchase food. Post-secondary students with children, who experience food insecurity, may be at risk for nutritional deficiencies and other negative health and academic consequences by limiting or varying their own diet in order to ensure their children's needs are met.

Key Words: food insecurity; diet; interview; students; child; universities

Introduction

A commonly accepted definition of food insecurity in Canada and the United States is that food insecurity is the financial inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways (e.g., without resorting to emergency food supplies, begging, scavenging, stealing, or other socially unacceptable behaviors) or the uncertainty that one will be able to do so (Anderson, 1990). Given that food insecurity is a condition resulting from financial resource constraint, it is more prevalent in low-income households, which often includes households with children, lone-parent (mostly female-headed) households, and households having their main source of income from government assistance or welfare (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2015; Lindberg, Lawrence, Gold, Friel, & Pegram, 2015; Tarasuk, Mitchell, & Dachner, 2016). Students with children in their care who are enrolled at post-secondary institutions (that is, universities and colleges) from low- and middle-income households are also vulnerable to food insecurity due to the double financial burden of having expenses associated with both child-rearing and obtaining a post-secondary education (e.g., tuition and compulsory fees) (Cady, 2014; Luong, 2010; Silverthorn, 2016). In the US 26% of college undergraduates, most of whom are women, are parents of dependent children (Noll, Reichlin, & Gault, 2017) while in Canada student parents comprise about 17% of college students and 11% of university students (Lero, Smit Quosai & van Rhijn, 2007). Canadian students who are single parents living with their children experience among the highest rates of student food insecurity (Silverthorn, 2016). Student parents thus constitute an important portion of college and university populations that deserve attention to prevent food insecurity and its negative outcomes.

Food insecurity can negatively impact students and their children through diets of poor quality (Fram, Ritchie, Rosen, & Frongillo, 2015; Kirkpatrick & Tarasuk, 2008), which can compromise academic achievement, health, well-being, and social functioning (Ashiabi, 2005; Holben, 2010; Jyoti, Frongillo, & Jones, 2005; McIntyre, Wu, Kwok, & Patten, 2017; Ramsey, Giskes, Turrell, & Gallegos, 2012). Based on child-care practices of food-insecure mothers (Buck-McFadyen, 2015; McIntyre et al. 2003), post-secondary student parents who are food-insecure may compromise their own nutritional intake in order to preserve the adequacy of their children's diets Many colleges and universities in Canada and the US have opened food banks or food pantries to help students who are struggling with food insecurity to cope with this reality. Relying on charitable food to alleviate food insecurity may be an act of desperation by these students when other coping strategies have failed to meet food needs. Given our superficial understanding of food insecurity among post-secondary students with children, our purpose was to explore the experience of food insecurity among post-secondary students with children who accessed a university-based food bank, including their experience with the food received from the university-based food bank, the impact of food insecurity on the wellbeing of their children and to identify the coping strategies they used to deal with food insecurity.

Key Messages

- Food-insecure student parents attending university use a variety of coping strategies to alleviate food insecurity, including requesting charitable food hampers from their campus food bank.
- Food provided by food banks may be perceived by student parents to be nutritionally inadequate or culturally inappropriate for children.

- Food insecure student parents sacrifice their own dietary needs to shield their children from hunger by preferentially giving higher quality foods to them.
- Food insecure student parents and their children are potentially at risk for dietary inadequacy and a myriad of negative health outcomes.
- Efforts to mitigate food insecurity are needed for student parents.

Methods

Design

We undertook a qualitative descriptive study (Sandelowski, 2000) to explore the experience of food insecurity among post-secondary students with children who were attending a Canadian university. All participants were clients of the food bank on their campus where approximately 17% of users have dependent children. (Authors, 2016).

Setting

The food bank at [blinded] is a charitable organization operated by the Students' Union. It provides free food hampers to students and their dependents in need of food; however, users can request a hamper only once every two weeks. Hampers are modeled after *Eating Well with Canada's Food Guide* (Health Canada, 2011), are designed to provide a 5-day supply of food (at the time of the study it was a 4-day supply), include a milk voucher and a combination of non-perishable and perishable foods (e.g., four eggs per person if available when picking up hamper), based on the available food inventory. The quantity of food provided to each client is based on the number of people in the household and when possible, cultural restrictions are

accommodated. Clients with children are also provided with peanut butter and may request infant formula and diapers if they are available.

Participants

Students were purposively recruited via email September 2013 through April 2014 from a larger study of food insecurity among student clients of the university's food bank. ([blind]). To be eligible for the current study, students must have had at least one child (< 18 years old) in their care, been verified as food insecure based on their responses to the validated 10-item Adult Food Security Survey Module (Bickel, Nord, Price, Hamilton, & Cook, 2000), used the food bank on campus at least once in the prior year, and indicated their willingness to participate in an in-depth interview about food insecurity.

Data collection

Semi-structured, individual interviews were conducted in a private room on campus. An interview guide (Table 1) ensured key issues of interest were queried. The guide was developed by the research team, which included two nutrition professors with expertise in food insecurity, and pilot-tested with three graduate students studying nutrition to ensure the questions were appropriate and understandable. A sample food hamper was on display during the interviews to stimulate discussion. (Table 2) Informed, written consent was obtained prior to the interviews and participants received a $35 (Canadian dollars) gift card to a local grocery store to compensate them for their time. During the course of the interviews the Principal Investigator who was a graduate student in nutrition took notes and memos to record anything of interest that may not have been captured by the interview recordings.

Data Analysis

Interviews were digitally recorded and transcribed verbatim by the Principal Investigator. A second researcher reviewed excerpts of 5 transcripts to ensure their accuracy and completeness. Data were analyzed using conventional content analysis as described by Hsieh and Shannon (2005) permitting codes and categories to be drawn from the data using participants' words. This surface level description is appropriate when existing theory or research literature on a phenomenon is limited. Rather than imposing preconceived categories onto the data, conventional content analysis permits the naming of categories from the data itself (Hsieh & Shannon, 2005). Transcripts were color coded into different categories and sub-categories using line-by-line analysis of the transcripts as well as through constant comparison (Hsieh & Shannon, 2005). To enhance validity, a second researcher reviewed the coded transcripts and the categories. Subsequently, categories were discussed with the research team to ensure there was agreement on naming and placing of codes into correct categories and to ensure categories were distinct and separate (Mayan, 2009). Frequency data related to each sub-category were tabulated. Herein, we report findings which related to how food insecurity was experienced by students *given their role as parents,* how they coped with food insecurity *as student parents*, how they perceived food insecurity *impacted their children*, and *how they protected their children* from food insecurity. The research study was approved by the Health Research Ethics Board at the [blinded].

Results

Nine student caregivers (n=5 male, n=4 female) participated in the study. All were full-time post-secondary students and had one (n=7) or two (n=2) children. Caregivers were graduate (n=4) and undergraduate (n = 5) students and included both international (n=4) and domestic (n=5) students. Categories, sub-categories and exemplar quotes derived from content analysis are shown in Table 3.

Parents protect their children from food insecurity

Six student caregivers mentioned protecting children from food insecurity during the interviews. Students protected their children from food insecurity by giving them perceived higher quality foods (e.g., by purchasing store food for children and eating food bank food themselves) (n = 3), forfeiting food if there was not enough so that children could eat (n =2), and ensuring children's dietary needs were met before their own (for instance, by allowing children to choose from available food first) (n = 2). For example, one caregiver mentioned that *"they don't eat too much and for them (children) we can always provide them with food. Even if I decide to eat less for me."* (Participant # 8) Another caregiver said: *All of the like the breakfasts and the lunch or the snacks that's the food bank stuff I eat and so that's where he gets separate food. And then the food we eat together that I cook is I guess the non-food bank food, the food I had to buy from the grocery store…Yea he always gets everything first.* (Participant #9)

Experience with food in the hamper

Seven student caregivers discussed the appropriateness of food provided in the hampers for their children, including references to the quality (n=3), quantity (n=4), and cultural/religious appropriateness of the food provided (n=3). Some caregivers mentioned that

they threw out 25%-50% of the food that they received in hampers because it expired before they could eat it (n=5) or the food was inappropriate due to dietary preferences or religious/cultural requirements (n=4). For example, one caregiver commented on concerns about the canned foods in the hampers, *"For me it's very common to eat fresh products. We never ate cans. And sometimes that is my concern. How umm these kinds of foods could affect my son."* (Participant # 3) However, not all experience with the food in the hamper was negative. Two caregivers felt the food provided by the food bank on campus was appropriate for them and their children. For example, one caregiver said "*Yea for sure it absolutely it's a great, umm pretty much everything that's in it we eat. Like you know my son eats cereal*" (Participant #6)

Impact of food insecurity on children's perceived wellbeing

Seven student caregivers mentioned that they perceived that food insecurity had no impact on their children, including one student with an infant who was breastfed exclusively. Two students felt that food insecurity negatively influenced their children's wellbeing. One student indicated that they had to feed their infant cheaper formula. The other student reported that their child was anxious about the family's financial situation and described a fantasy scenario in which he wanted to become an American football player to earn money for his mother. *He knows, he's so smart. He knows we were in trouble….he told me last week I think, uh he said mom don't worry I will be an American football player and I will have a lot of money and I will buy you everything you want. I think it's the way he finds a solution for the situation.* (Participant # 3)

Coping Strategies

Student caregivers described a variety of coping strategies (in addition to accessing food hampers from the food bank located on campus) to help mitigate the effects of food insecurity. Coping strategies could be classified five ways. These were *(i)* non-food related income management strategies (n=4; e.g., decreased spending on non-essentials); *(ii)* food related income management strategies which were active decisions about food purchasing to save money (n=4; e.g., purchasing lower quality foods, using coupons to purchase food, shopping at discount stores); *(iii)* food management behaviors (n=4; growing food in a garden, skipping meals, eating smaller portions); *(iv)* social support strategies (n=5; e.g., borrowing money from friends and family, eating meals at the homes of friends and family); and, *(v)* community support strategies (n=5; e.g., accessing food from other food banks or mother and infant health programs). One example of a non-food related income management strategy is as follows: *"I don't buy clothes for my son like I get everything second-hand and I try to do like I'll put his old clothes on Kijiji* (a classified advertisement website) *and I'll trade them for something…also I don't eat out very much"* (Participant # 6)

Discussion

Our qualitative descriptive study explored the experience of food insecurity among post-secondary students with children who were attending a Canadian university and who had accessed a university-based food bank to feed themselves and their children. Student caregivers discussed experiencing a variety of negative dietary consequences of food insecurity, despite using of multiple coping strategies to mitigate food insecurity such as accessing

additional community food programs, food budgeting, reducing the size of food portions, and borrowing money from friends and family or eating at their homes. Most participants spoke about how they tried to protect their children from having a diminished diet or experiencing hunger by preferentially giving them perceived higher quality foods or forfeiting food themselves, respectively. A consequence of these behaviors was that participants tended to describe the nutritional quality of their own diet as being poorer than that of their children. Most participants felt that their children were not negatively impacted by food insecurity as a result of the strategies that they utilized to protect them.

Our findings among student caregivers support observations from other food security literature demonstrating that mothers compromise their own nutritional intake to preserve that of their children (Buck-McFadyen, 2015; McIntyre et al., 2003). The literature suggests that parents who struggle with food insecurity may compromise their own diets to ensure that their children eat, thereby sacrificing their own health and wellbeing to shield their children from food insecurity. Despite these parental efforts, research has also shown that children in food-insecure households have negative conditions, both short and long-term, including poor academic performance, reduced mental health, insufficient intake of essential nutrients, and increased risk of chronic disease (Ashiabi, 2005; Holben, 2010; Ivers & Cullen, 2011; Jyoti et al., 2005; Ke, & Ford-Jones, 2015; Ramsey et al., 2012 Ramsey et al., 2011; Tarasuk et al., 2014). The findings of these adverse outcomes imply that parents are unable to fully protect their children from the consequences of food insecurity, even when they believe they are doing so (Nalty, Sharkey, & Dean, 2013). Despite literature that suggests otherwise, most student caregivers in the present study indicated that they perceived children had been shielded from

food insecurity and were not negatively impacted by it. However, parent proxy accounts of children's food insecurity may present an inaccurate or incomplete representation of children's actual experiences. (Fram et al., 2011; Nalty, Sharkey, & Dean, 2013).

Charitable food organizations are pervasive on campuses in Canada (Silverthorn, 2016) and the United States (College and University Food Bank Alliance, 2017). Food banks and food pantries located on universities and colleges do not address the root cause of food insecurity which is inadequate income and cannot provide for the nutritional needs of their food insecure clients. A Canadian study of campus food banks indicated that they provided limited access to cultural foods (Silverthorn, 2016), which was a complaint also voiced by our participants who additionally commented on the perceived poor quality of the food that they received in hampers. Despite the food bank's efforts at [blinded] to provide nutritious foods, the quality of food in hampers can be inadequate to meet nutritional requirements; specifically they are very low in fat and protein from animal sources. (Author & Author, 2006; Authors, 2014). This is due the food bank's reliance on food donations and its inability to provide many perishable foods.

Our study was not without limitations. First, children were not interviewed separately about their experience of food insecurity, so we are unable to state with confidence that children and their student caregivers held similar views of food insecurity and how this experience impacted children. Indeed, parent proxy accounts of children's food insecurity may present an inaccurate or incomplete representation of children's actual experiences (Fram et al., 2011; Nalty et al., 2013). Second, we did not objectively measure the dietary intake of caregivers or their children, so we have no data on the impact food insecurity had on actual

food intakes or the degree to which food hampers satisfied or augmented their nutritional requirements.

Conclusions

Despite the centrality of parenthood to the post-secondary student experience, little is known about the needs or experiences of student-parents attending university or college, many whom are women. Post-secondary student parents in our study tried to protect their children from food insecurity by limiting or modifying their own diets, which likely diminished the quality of their own diets and placed them at greater risk for the adverse health and academic consequences of food insecurity. Student parents may turn to campus food banks to mitigate food insecurity although these organizations are likely insufficient to mitigate food insecurity and also do not address its root causes. Post-secondary institutions need to focus on responding to the root causes of the issue of student food insecurity as it could be a barrier to students' academic achievement and well-being and bring harm to the children of student parents. Post-secondary institutions could provide additional support to student parents by increasing scholarship and bursary opportunities for them, providing subsidized childcare options, and by enhancing the availability of high quality food resources either through campus food banks or other campus food programs designed specifically for student caregivers.

Given their increased vulnerability to food insecurity, further research and support are needed to both raise awareness and mitigate the detrimental effects of food insecurity in the population of student caregivers. In light of student parents' perceptions of the minimal impact of food insecurity on their children's health and well-being, there is a need to conduct further

studies that include children's experience of food insecurity to elucidate a more complete picture. Research with relevant stakeholders (*e.g.,* students, government representatives, food bank staff, university administrators) would be valuable in helping to develop, implement, and evaluate approaches designed to reduce food insecurity in post-secondary student parents and their children.

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Table 1. Interview Guide

Reasons for using the Campus Food Bank and the impact of the Food Bank on the student's life

- Think of the first time that you went to the food bank. What happened in your life that made you decide to ask for food from the food bank?
- How did the food hamper you received help you to get enough food to eat?
- If the hamper didn't provide enough to eat, please tell me why not?
- Do you feel that the kinds of foods in the food hampers are appropriate for you? Please explain why or why not.
- Do you feel that the foods in the hampers are appropriate for your children? Please explain why or why not.
- Can you describe your feelings about getting food from the Campus Food Bank?
    - Probe: How does it make you feel to ask for food?
    - Probe: Do you feel OK to get food this way?

The impact of food insecurity on student's education and their children's well-being

- Please describe to me how a lack of food or money for food has influenced the quality of your university experience, including your ability to study.
- How does a lack of food or money for food impact the well-being of your children?

Coping strategies

- Apart from using the Campus Food Bank, what do you do if you run out of food or money to buy food? What would you do if the Campus Food Bank did not exist?

Food related behaviors

- What kind of challenges do you face as a student with children that affect your eating habits?
- How does being a student affect your ability to eat nutritious food?
- Describe how your diet has changed since you started University. (For students who had children before beginning their studies.) OR Describe how your diet has changed as a student since having children. (For students who had children while undertaking their education.)
- How would you describe the nutritional quality of the food that you consume?
- How would you describe the nutritional quality of the food your children consume?
- How would you change what you eat if you could?
- How would you change the food your children eat if you could?
- What is your biggest barrier to eating the types of foods that you want?
- How is food shared between adults and children within your household?

Challenges to achieving food security

- What are some of the challenges you face as a student with children regarding obtaining adequate food?
- What could be done to overcome these challenges?
- What was your food security status prior to beginning your studies?

Suggestions for Change

- What would you suggest could be done to improve your ability to acquire food?
- How would you like to see the services of the Campus Food Bank changed to better meet your needs?

Wrap up Questions

- Is there anything else that you would like to talk about or add that we haven't yet discussed?
- Is there anything else you think is important for me to know?

Table 2: A sample food hamper that participating students with children might have received from the food bank at (blinded)

Four Person Food Hamper (2 adults and 2 children)
5 cans each of: • Beans (e.g., kidney, brown, chickpeas) • Meat/fish (e.g., tuna, turkey, chicken) • Soup (e.g., chicken noodle, vegetable) • Vegetables (e.g., carrots, corn, potatoes) • Fruit (e.g., peaches, apple sauce, pineapple)
2 cans/jars of: • Pasta/tomato sauce
3 packages of: • Macaroni pasta and powdered cheese
1 package each of: • Rice (1.25 kg), pasta (1 kg), rolled oats (1 kg) • Cereal • Juice (2 liters if available) • 1 milk token redeemable for 1 liter of milk • Peanut butter (clients with children only)
Bread and other items such as eggs, fresh fruits and vegetables were included upon food hamper pick-up if available.

Table 3. Summary of Student Caregivers' (n=9) Experiences with Food Insecurity

Category	Sub-Category	Exemplar Quotes
Parents protect their children from food insecurity	Give children perceived higher quality foods while eating food bank food themselves (n = 3)	"…yea I end up eating a lot of the food bank food and he gets what he likes" (Participant # 9) "No I'm not going to have an apple. There are only 3 apples left. I'm going to eat this (tuna)" (Participant # 6)
	Forfeit food to ensure kids have enough (n = 2)	"… if there wasn't enough then I would reduce my quantity" (Participant # 8)
	Ensure children's dietary needs are met first (n =2)	"Yea he gets first dibs (laugh) he is growing, I'm not (laugh)" (Participant # 2)
Experience with the food in the hamper	Appropriateness for children (n = 7)	"I found some foods that I didn't really use because I am Hindu and we didn't eat beef and sometimes like canned food or the noodles or whatever they have beef flavours….in that case I need to just

	whatever food I have if I found these things I have to put it back in the self-service shelf" (Participant # 4)
	"… my kids when they saw the date and say oh daddy this is the expiry and I don't want to eat" (Participant # 4)
	"He doesn't like food bank food. Generally because it's not the type of food he would like…..I said how about you eat some food from the food bank and then you can eat other food that you like to have from the store. So he agreed to eat it." (Participant # 9)
	"Yea for sure it absolutely it's a great, umm pretty much everything that's in it we eat. Like you know my son eats cereal" (Participant #6)

		"… they like the foods" (Participant # 8)
Impact of food insecurity on children's perceived wellbeing	Negative impact (n = 2)	"I have to go to the cheaper (infant) formula so it definitely will impact in his body development also" (Participant # 5)
	No impact (n = 7)	"I think the children are still eating the balanced diet, they like the fruits, juice, milk uhh rather than eating the rice." (Participant #4)
Parents' coping strategies to manage food insecurity	Community support (n = 5)	"This program, they call it *Health for Two* in my community room for the family who just have the newborn baby maybe if they meet some difficulty for the food and uhh they can get some help. Actually we already get some help" (Participant # 1)

Social support (n = 5)	"If I have a desperate situation I can visit her (sister). Yea we don't have food tonight but I can say tonight we can go with you aunt or your aunt invite us to dinner." (Participant # 3)
Non-food related income management strategies (n = 4)	"We never run out of money, but we really maybe run very low of money…always saving money for in case of" (Participant # 1)
Food related income management strategies (n = 4)	"It seems like most of the people buy formula as Enfamil. It is much more expensive and then other companies also who provide the cheaper formula, so I have to go to the cheaper formula." (Participant # 5)
Food management behaviours (n = 4)	"One year we applied for a garden plot and during the summer it's a very good source of vegetables…but I would not say my experience

	was 100% positive because my pumpkins got stolen by somebody the night before I was going to pick them." (Participant # 8)

Chapter 8: Summary

8.1 Overview of Findings

Conducted between 2012 and 2014, my thesis research included a narrative review and qualitative research that explored food insecurity among post-secondary students at the University of Alberta. In the narrative review, I conducted a search to locate articles examining food insecurity among post-secondary students in developed countries. Articles published between January 2000 and June 2016 were included in the review. A total of 21 studies were included in the review with a total of 18,450 students included. Prevalence estimates for food insecurity ranged from 12.7 to 89% among participants. Identified risk factors included low income, being a visible minority, living away from home and being reliant on government assistance. A variety of negative consequences were reported, including diminished academic performance and poor dietary quality. A number of studies also reported strategies employed by post-secondary students to cope with food insecurity, which included food and income management, as well and social and community support. Overall, the review showed that food insecurity is an issue among post-secondary students and can contribute to a number of negative outcomes and therefore warrants further research to determine the causes and consequences of food insecurity in this population.

In the second part of my thesis research, I developed and conducted a qualitative study of food insecure post-secondary students caring for children. I carried out semi-structured interviews with 9 university food bank clients who had at least one child under the age of 18 in their care. The qualitative study had eight objectives. The objectives were (1) to explore

students' reasons for using the CFB; (2) students' feelings about using the CFB; (3) the impact of food insecurity on the quality of academic experience and achievement; (4) the impact of food insecurity on the wellbeing of students; (5) to understand the barriers to overcoming food insecurity; (6) to explore the impact of food insecurity on the wellbeing of students' children; (7) to explore the experience with the food received from the Campus Food Bank for students and their children; and (8) to identify coping strategies that students with children used to deal with food insecurity.

In my first qualitative manuscript I explored objectives 1-5. My analyses revealed that participants reported financial crises as the primary reason for using the services of the CFB and the primary barrier to overcoming food insecurity. Financial hardships included loss of scholarships or other income as well as unexpected expenses. Other barriers to food insecurity included a lack of time for shopping for food and preparing meals, lack of adequate transportation and lack of cooking skills or language barriers. Participants were mixed in their feelings about getting food from the food bank as well as about the type of food they received in the food hampers. Not all participants felt the same way about requesting food charity. Some participants felt negatively about asking for food as they were embarrassed or ashamed to be using the food bank; some felt positively that they could receive extra support from the university; and, some were conflicted as they felt maybe there were other students who could use the services of the CFB more than them. Some participants reported negative effects on their academic performance and their social and mental wellbeing. The impacts on academic performance included failing a test, reduced grades and inability to concentrate in class due to hunger or stress. Participants reported that not having enough money for food caused them

stress as they worried about where their next meal would come from. This lack of money to buy food also affected the social university experience for some participants as they reported not participating in study groups as they did not have money to purchase coffee and food like other students and felt embarrassed to bring their home-cooked food to the group.

The second manuscript addressed objectives 6-8 and found that participants overwhelmingly felt that their children were not affected by food insecurity as they took measures to protect them such as compromising their own dietary intake to ensure their children's needs were met first. Participants mentioned giving their children food first, or forgoing food if there was not enough for both themselves and their children. In regards to the food they received from the CFB, many participants disliked that much of the food was soon to expire when they received it and they perceived the quality to be lower than store-bought food because of the primarily non-perishable food content of food hampers. They also mentioned that some foods were culturally inappropriate or unfamiliar to them and their children and they ended up throwing away or recycling (through donating back to other food banks) a portion of the food they received in the hamper. However, some participants were happy with the quantity and quality of food provided by the food bank and said that their children liked the foods that the food bank provided. In addition to using the services of the CFB, participants reported using other coping strategies to help mitigate the effects of food insecurity. These included food related income management, non-food related income management, food management behaviours, social support and community resources, many which corresponded to coping strategies revealed in my narrative review. There was a range of strategies reported such as reducing the quality of food purchased, or purchasing food from cheaper stores, as well

as skipping meals or eating with friends and family. Strategies such as using additional food banks (other than the CFB) and other sources of charitable food were also mentioned by participants.

A conceptual framework (Appendix 6) shows the connections among themes, categories and subcategories derived from the qualitative research. It identifies the centrality of parents protecting their children from food insecurity as an overarching theme; that students used the CFB both in response to a financial crises and to prevent a crisis; that food insecurity has the potential to negatively impact student's academic performance and the well-being of both students and their children; that time, knowledge and food accessibility are barriers to overcoming food insecurity; and, that students utilize many strategies to try to cope with a lack of food. The framework indicates that students with dependent children have their own concerns about the food they receive in hampers, in addition to concerns about whether the food is liked by their children or is of sufficient quality for children to eat.

8.2 Significance of Findings

The findings of this thesis are important as they add to the growing body of literature on post-secondary student food insecurity, which is an issue that has only recently coming to light. Additionally, the majority of the existing literature on post-secondary student food insecurity focuses on prevalence of food insecurity rather than on exploring the experience of food insecurity for students. It is important to precisely determine the prevalence of food insecurity among post-secondary students so that key decision makers and policy makers can use this information to make evidence-based decisions to allocate resources such as financial aid and

scholarships more effectively. The qualitative study explored in-depth some of the reasons that post-secondary students experience food insecurity, how it impacted their wellbeing and that of their children, and how they coped with food insecurity. Post-secondary students with children represent a population potentially at increased risk for food insecurity, and the negative consequences associated with food insecurity, as they cope with the double financial burden of post-secondary education and child-rearing. The findings of this study could help researchers better understand the unique situation faced by food insecure student parents and serve as an impetus for future research examining the consequences of post-secondary food insecurity.

The findings of the qualitative study also provide supporting information to the body of literature regarding parents compromising their own nutritional intake to protect their children. (Buck-McFadyen, 2015; McIntyre et al. 2003) As in studies among non-students, the majority of participants in the qualitative study reported that they felt their children were not affected by food insecurity as they were able to protect them by compromising their own food intake. This is an important finding as it demonstrated that food insecure post-secondary students behave in similar ways to other food insecure parents when it comes to attempting to protect their children from food insecurity. The results of the qualitative study will help university administrators to better understand the challenges faced by post-secondary students with children in regards to overcoming food insecurity and to develop better resources for student parents to educate them and ensure their financial needs are met during their studies. For example, the university could provide subsidized childcare for students with children and additional bursary support to help with the financial burden student parents' face. The

university could also consider providing community kitchen programs geared towards utilizing the types of foods the CFB provides and other low cost, but healthy foods to teach student parents how to eat well on a budget. These types of solutions could help student parents meet their food needs while attaining their education and caring for their children.

Based on the proliferation of food banks on post-secondary campuses across North America, it would seem that food insecurity is an increasing problem among post-secondary students. (College and University Food Bank Alliance, 2017; Silverthorn, 2016) As food insecurity is increasing among the post-secondary population, it is important for universities and policy makers to better understand the underlying causes and consequences of food insecurity to ensure that suitable solutions can be developed to address food insecurity among post-secondary students. The findings of this research confirm previous research, which suggests that income inadequacy is the primary contributor to food insecurity in Canada. (Howard, & Edge, 2013) In the current study, most of the participants experienced food insecurity due to an unexpected financial crisis that necessitated their use of the CFB. This information can be used to inform post-secondary institutions and student funding providers about the situation faced by post-secondary students in order to increase the amount of basic funding provided to students and provide better emergency support funding. These findings should also be useful to the CFB, as they can help this organization to better understand and meet the food needs of its student clients. For example, participants reported that they would prefer to receive more perishable foods such as fruits, vegetables, dairy and meat as well as more culturally relevant foods.

An important finding was that some students discarded or returned much of the food they received in hampers because they considered it culturally inappropriate or suboptimal because of its best-before date. As the CFB serves clients from a wide-range of cultural backgrounds, it is important for them to provide a diversity of foods to meet the requirements of students with various dietary restrictions and preferences, such as halal foods and vegetarian foods, in order to avoid inappropriate food being given and subsequently discarded by these clients. In North America, a substantial amount of palatable and safe food is wasted due to misunderstandings about food labelling dates. (Leib et al., 2013) A best-before date is not the same as an expiration date, yet consumers often confuse the two date types. According to the Canadian Food Inspection Agency (CFIA) the "best-before" date, also known as a durable life date, is not an indicator of food safety, neither before nor after the date, meaning that consumers can buy and eat foods after the best-before date has passed. (Canadian Food Inspection Agency [CFIA], 2017) In contrast, expiration dates are required only on certain foods that have strict compositional and nutritional specifications, which might not be met after the expiration date. (CFIA, 2017) Most non-perishable food provided in hampers (e.g., canned items and dry goods) has a shelf life that exceeds their best-before date, although there may be a change in flavour, texture or nutrition in some cases. Generally, if the food changes colour or appearance, or develops a bad smell, it is no longer safe to eat. (CFIA, 2017) A fact-sheet with this information could be given to food bank clients to prevent them from discarding food that appears to be too old to consume based on food labels.

8.3 Strengths and Limitations

In terms of the strengths of this thesis research, the inclusion of a narrative review on post-secondary student food insecurity confirmed that it is a problem in developed countries, such as Canada and warrants further attention. Another strength of including a narrative review as part of the thesis was that it allowed us to confirm that the majority of existing literature is cross-sectional in nature, which provided further validation for the need for conducting the qualitative study to explore in-depth the experiences of food insecurity among a sample of post-secondary students. The qualitative study provided valuable insight into beginning to understand the problem of food insecurity among post-secondary students with children. The rich information gained from the semi-structured interviews provided novel information about the experience and consequences of food insecurity among this group that cannot be obtained from quantitative cross-sectional studies. Lastly, to our knowledge, this research is the first of its kind to qualitatively explore the experiences of food insecure post-secondary students with children.

The studies that formed this thesis research were not without limitations. The narrative review returned a small number of studies, from a limited number of countries, which shows that there is a lack of research on the subject, which prevented us from gaining a comprehensive understanding of post-secondary student food insecurity. Also, while the studies included in the narrative review examined prevalence of food insecurity among post-secondary students in developed countries, the results showed a very large variation in the reported prevalence of food insecurity, which calls into question the validity of the findings. Due to this wide prevalence estimate of food insecurity among post-secondary students in developed countries, it is hard to say with certainty that the findings represent the true

prevalence. Additionally, the included studies were not designed in such a way as to capture true prevalence estimates of food insecurity as they did not use random samples, there was selection bias, and many did not use validated food insecurity measurement tools. For the qualitative study, the use of a purposive sample makes it hard to generalize our findings to the broader post-secondary student population. While parents reported that they protected their children from food insecurity, children were not interviewed separately about their experience of food insecurity, so we were unable to state with confidence that children and their student caregivers held similar views of food insecurity and how this experience impacted children. Indeed, parent proxy accounts of children's food insecurity may present an inaccurate or incomplete representation of children's actual experiences. (Fram et al., 2011; Nalty, Sharkey, & Dean, 2013) In regards to the impact of food insecurity on their nutrition, we did not objectively measure the dietary intake of caregivers or their children, so we have no data on the impact food insecurity had on actual food intakes or the degree to which food hampers satisfied or augmented their nutritional requirements. Lastly, due to stigma associated with food bank usage, CFB clients may not have wanted to participate in the study, which contributed to the small sample size. Despite these limitations, our study contributes valuable new knowledge to the understanding of post-secondary food insecurity.

8.4 Recommendations and Future Research

The findings of this study indicate that the primary contributor to food insecurity is inadequate income to meet the variety of financial demands faced by post-secondary students. With tuition and mandatory fees increasing, while government funding for post-secondary

education is decreasing, the burden of financing post-secondary education is increasingly being thrust upon the students themselves. (Luong, 2010) This may cause many students to rely on student loans to meet their financial needs. However, research has shown that student financial aid in Canada is insufficient to meet the needs of post-secondary students, which may contribute to food insecurity. (Burley & Award, 2015; Meldrum & Willows, 2006) One way governments could respond to this problem is by increasing the amount of student loan funding provided to students while also freezing tuition and mandatory fees. At the university level, an increase in the number of scholarships and need-based bursaries would also help to address the underlying contributor to post-secondary food insecurity, inadequate income. It may also be worthwhile, as a long-term solution, for the federal government to consider reforming the student loan program altogether as student debt may also hinder food insecure post-secondary students from achieving food security after they graduate. (Canadian Federation of Students Ontario, 2013) A number of countries, such as Australia run student loan programs that are repayable only once a student's post-graduation income reaches a comfortable level at which point loan payments are deducted as a fraction of wages earned, similarly to taxes. (Marcus, 2016) If no money is earned then no loan payments are required. Additionally, the Australian student loan program does not charge interest on loans, loans are only increased with inflation, (Marcus, 2016) which is much lower than interest rates currently faced by Canadian student loan borrowers. (Government of Canada, 2017)

Though we did not directly measure diet quality in the qualitative study, anecdotal accounts from participants suggest that many of their diets were compromised and nutritionally inadequate. This may be as a result of consuming a portion of their diet from food

hampers. Previous research examining the quality of food provided in the CFB hampers found them to be very low in sources of animal protein and fat (Jessri, Abedi, Wong, & Eslamian, 2014; Meldrum & Willows, 2006). Though food banks are not a sustainable solution to the problem of food insecurity (Loopstra & Tarasuk, 2012; Tarasuk, 2005), an increasing number of students are utilizing the services of the CFB, therefore the University of Alberta and the Student's Union should consider working together to improve the quality and quantity of food provided to students. One strategy could be to work more closely with local food retailers to obtain higher quality perishable foods more quickly before they expire. This would increase the amount of perishable foods available to CFB clients, which was one of the most common suggestions made by participants. Another strategy to improving the quality of food provided to CFB clients is to educate the public about the preference for cash donations over food donations as money could be used to purchase more appropriate and nutritious food for the CFB clientele. Other food banks have adopted models where clients are allowed to choose their own groceries from the food bank (UBC, 2017) which allows more autonomy to students and makes it more likely that the food students take home will be to their individual preferences and cultural requirements. This type of approach could be useful to the CFB as it may help eliminate some of the food waste reported by participants. Another recommendation for the CFB would be to provide grocery store certificates which could be used by clients to purchase food that would best meet their needs while allowing them to retain dignity in food acquisition. As an alternative to the traditional food bank model, the university could also consider a community approach to addressing food insecurity among students, such as the one utilized by the Stop Community Food Centre. (The Stop, 2017) In addition to providing emergency access

to high-quality food, community food centres, such as The Stop, offer food skills programs, education, and access to income support resources. (The Stop, 2017) The goal of these types of programs is to "put the needs and experiences of people at the centre of how services are organized and delivered" (Community Food Centres Canada, 2017).

The findings of the narrative review showed that the majority of research on post-secondary student food insecurity is cross-sectional in nature examining primarily the prevalence of food insecurity. Therefore it is hard to determine the causal relationship between food insecurity and the various negative outcomes among this population. There is a need for longitudinal research using large, random samples and validated tools to measure food insecurity among post-secondary students, and research that explores the causes and long-term consequences of experiencing food insecurity as a post-secondary student. However, it is worth acknowledging that designing high quality quantitative studies for this population may be difficult as it is challenging to obtain truly random samples (i.e., students cannot be forced to participate, and convenience samples require less resources) and longitudinal studies pose a problem given that students generally only stay at the university for the duration of their studies, which may make long-term follow-up difficult. Some of the effects of food insecurity that warrant further attention are the effect of food insecurity on student academic achievements, and the long-term health consequences of experiencing food insecurity as a post-secondary student. There is also a need to determine whether food insecurity is an issue of concern in a diversity of economically advantaged countries and for different groups of students including those from low-income families, visible minority groups, and those with children.

In addition, future qualitative work is needed to understand and explore the causes and consequences of student food insecurity. Qualitative research allows for a richer examination of a topic and can help answer complex research questions, such as why and how people experience food insecurity, which is harder to capture through quantitative research. While our qualitative study began to uncover the experience of food insecurity among post-secondary students with children, more research is needed which includes perspectives of students as well as their children to gain a more comprehensive picture. Also, qualitative research examining the experience of food insecurity among other vulnerable groups, such as international students, ethnic minority groups and low-income students is also warranted.

Postsecondary institutions need to focus on responding to the root causes of the issue of student food insecurity as it could be a barrier to students' academic achievement and well-being. Based on the findings of this thesis, it is clear that current strategies (e.g., CFB, scholarships, bursaries) are inadequate to address the food security needs of post-secondary students. It is important that these findings be communicated to key university administrators and researchers through various knowledge dissemination activities, such as community forums, conference presentations and the publication of manuscripts. Also, research with relevant stakeholders (*e.g.,* students, government representatives, food bank staff, university administrators) would be valuable in helping to develop, implement, and evaluate approaches designed to reduce food insecurity in post-secondary students.

8.5 Conclusions

This research study has contributed to the limited research on post-secondary food insecurity by highlighting the prevalence of food insecurity among post-secondary students in

developed countries and improving our understanding of the experience of food insecurity of post-secondary students caring for children. Food insecure students with children experienced a range of negative effects on their academic achievement and mental and social wellbeing and coped with food insecurity in a variety of ways. Further research is required to ascertain the directionality of the relationship between food insecurity and negative outcomes. The results highlighted the fact that campus food banks are not a suitable long-term solution for student food insecurity as negative outcomes of food insecurity persisted with food bank usage. Post-secondary institutions could provide additional support to student parents by increasing scholarship and bursary opportunities for them, providing subsidized childcare options, and by enhancing the availability of high quality food resources either through campus food banks or other campus food programs designed specifically for student caregivers. While further research is required to better understand the causes and consequences of food insecurity among post-secondary students, it is clear from the results of this thesis that it is an issue that merits attention. Universities should work together with governments and policy makers to enact sustainable solutions to the persistent problem of post-secondary food insecurity to ensure that students can have the best possible chance for success in university and beyond. This could be accomplished by having as many post-secondary institutions as possible in Canada, conduct surveys on the number of food insecure students in their institutions and to correlate food insecurity with those that are receiving financial aid. If universities and governments are able to see the numbers of food insecure students both locally and nationally, and the magnitude of negative consequences perhaps this will be the impetus that drives

change in the federal and provincial higher education funding schemes and lead to improved funding for students and subsequently decreased food insecurity.

8.6 References

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Appendices

Appendix 1: Sample CFB Food Hamper

One Person Food Hamper	**Four Person Food Hamper:**
2 cans each of: • Beans (kidney, brown, chickpeas etc.) • Meat/Fish (tuna, turkey, chicken) • Soup (chicken noodle, vegetable etc.) • Vegetables (carrots, corn, potatoes) • Fruit (peaches, apple sauce, pineapple) 1 can/jar of: • Pasta/Tomato sauce 1 package each of: • Instant Macaroni & cheese • Pasta, Rice, Rolled Oats (500g each) • Juice (1L if available) • 1L Milk Token redeemable at Lister Marina	5 cans each of: • Beans (kidney, brown, chickpeas etc.) • Meat/Fish (tuna, turkey, chicken) • Soup (chicken noodle, vegetable etc.) • Vegetables (carrots, corn, potatoes) • Fruit (peaches, apple sauce, pineapple) 2 cans/jars of: • Pasta/Tomato sauce 3 packages of: • Instant Macaroni & cheese 1 package each of: • Rice (1.25kg), Pasta (1kg), Rolled Oats (1kg) • Cereal • Juice (2L if available) • 1L Milk Tokens redeemable at Lister Marina • Peanut Butter (clients with children only)
Bread and other items such as eggs, fresh fruits and vegetables will be included upon pick-up if available.	

Appendix 2: Short Quantitative Survey

Campus Food Security Survey Study ID _____
Date (mm/dd/yyyy) _____/_____/_____ Interviewer _____

First, I am going to ask you some basic questions about yourself, your student status, and your living arrangements.

1. Which of the following categories best represents your student status?

    a Undergraduate
    b Master's
    c PhD
    d Post-doctoral fellow
    e Open studies
    f Other (*please explain)*: _____

2. Are you a full-time or part-time student? *(Full time is three or more courses per fall or winter term.)*

    a Full-time
    b Part-time

3. What year of your program are you currently in?

    a 1
    b 2
    c 3
    d 4
    e 5 or greater

4. Do you live alone?

    a Yes (go to #10)
    b No (go to #5)

5. Do you live with family members or relatives?

    a Yes
    b No

6. Do you share the cost of your food or meals with the people who live with you?

a Yes
b No

7. Are you the parent or caregiver of children under the age of 18 year who live with you?

a Yes (go to #8)
b No (go to #10)

8. How many children under 18 years old are in your care? _____

9. What is the age of the youngest child in your care? _____

10. What is your age? _____

11. What is your marital status?

a Single
b Married / living with a partner / common-law
c Separated / divorced / widowed
d Other (*please explain)*: _____

12. What is your primary source of income?

a Government student loan
b Scholarship or bursary
c Bank loan
d Research Assistantship
e Savings
f Family
g Employment (other than assistantship)
h Other (please specify) _____

Now I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for you in the last 30 days. If you are not sure about a question, or you don't want to respond to a question, just let me know and we'll go on to the next one.

[IF THE PERSON LIVES WITH OTHERS AND ANSWERED "YES" TO QUESTION 6, OR IF THE PERSON HAS CHILDREN UNDER 18 YEARS IN THEIR CARE, USE "OUR" AND "WE" IN PARENTHETICALS. IF THE PERSON LIVES ALONE OR ANSWERED "NO" TO QUESTION 6, USE "I" AND "MY" IN PARENTHETICALS]

13. The first statement is “I worried whether (my/our) food would run out before (I/we) got money to buy more.” Was that <u>often</u> true, <u>sometimes</u> true, or <u>never</u> true for (you/your household or living group) in the last 30 days?

    a Often true
    b Sometimes true
    c Never true
    d Don’t know or Refused

14. “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.” Was that <u>often</u>, <u>sometimes</u>, or <u>never</u> true for (you/your household or living group) in the last 30 days?

    a Often true
    b Sometimes true
    c Never true
    d Don’t know or Refused

15. “I couldn’t eat balanced meals because (I/we) couldn’t afford it.” Was that <u>often</u>, <u>sometimes</u>, or <u>never</u> true for (you/your household or living group) in the last 30 days?

    a Often true
    b Sometimes true
    c Never true
    d Don’t know or Refused

Questions 16 - 20 (only ask if affirmative response (i.e., "Often true" or "Sometimes true") to one or more of #13 - 15)

16. In the last 30 days, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?

    a Yes
    b No (skip #21)
    c Don’t know (skip #21)

17. How many days did this happen?

    a _____day(s)
    b Don’t know

18. In the last 30 days, did you ever eat less than you felt you should because there wasn't enough money for food?

    a Yes
    b No
    c Don’t know

19. In the last 30 days, were you ever hungry but didn't eat because there wasn't enough money for food?
    a Yes
    b No
    c Don’t know

20. In the last 30 days, did you lose weight because there wasn't enough money for food?
    a Yes
    b No
    c Don’t know

Questions 21 - 22 (ask if affirmative response to one or more of #16 - 20)

21. In the last 30 days, did you ever not eat for a whole day because there wasn't enough money for food?

    a Yes
    b No (skip #22)
    c Don’t know (skip #22)

22. How many days did this happen?

    a _____day(s)
    b Don’t know

Appendix 3: Qualitative Study Interview Guide

Topic Guide for Qualitative Interviews – Students with children

Icebreaker

- How long have you been studying at the University of Alberta?
- Did you have children before beginning your studies?

Reasons for using the Campus Food Bank and the impact of the Food Bank on the student's life

- Think of the first time that you went to the food bank. What happened in your life that made you decide to ask for food from the food bank?
- How did the food hamper you received help you to get enough food to eat?
- If the hamper didn't provide enough to eat, please tell me why not?
- Do you feel that the kinds of foods in the food hampers are appropriate for you? Please explain why or why not.
- Do you feel that the foods in the hampers are appropriate for your children? Please explain why or why not.
- Can you describe your feelings about getting food from the Campus Food Bank?
    - Probe: How does it make you feel to ask for food?
    - Probe: Do you feel OK to get food this way?

The impact of food insecurity on student's education and their children's well-being

- Please describe to me how a lack of food or money for food has influenced the quality of your university experience, including your ability to study.
- How does a lack of food or money for food impact the well-being of your children?

Coping strategies

- Apart from using the Campus Food Bank, what do you do if you run out of food or money to buy food? What would you do if the Campus Food Bank did not exist?

Food related behaviors

- What kind of challenges do you face as a student with children that affect your eating habits?
- How does being a student affect your ability to eat nutritious food?
- Describe how your diet has changed since you started University. (For students who had children before beginning their studies.) OR Describe how your diet has changed as a student since having children. (For students who had children while undertaking their education.)
- How would you describe the nutritional quality of the food that you consume?
- How would you describe the nutritional quality of the food your children consume?
- How would you change what you eat if you could?
- How would you change the food your children eat if you could?
- What is your biggest barrier to eating the types of foods that you want?
- How is food shared between adults and children within your household?

Challenges to achieving food security

- What are some of the challenges you face as a student with children regarding obtaining adequate food?
- What could be done to overcome these challenges?
- What was your food security status prior to beginning your studies?

Suggestions for Change

- What would you suggest could be done to improve your ability to acquire food?
- How would you like to see the services of the Campus Food Bank changed to better meet your needs?

Wrap up Questions

1. Is there anything else that you would like to talk about or add that we haven't yet discussed?
2. Is there anything else you think is important for me to know?

Appendix 4: Information Sheet and Consent Form

Information Sheet

Project Title: Hunger on Campus – Understanding food insecurity among students

Investigators

Dr. Noreen Willows, Associate Professor*	Principal Investigator
Dr. Geoff Ball, Associate Professor[§]	Co-Investigator
Dr. Anna Farmer, Associate Professor[*+]	Co-Investigator
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***** Department of Agricultural, Food and Nutritional Science

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Purpose of Research

Some students at the University of Alberta are food insecure. When students are food insecure, they may be worried that they are unable to acquire nutritionally adequate and safe foods, or they may not have the ability to acquire acceptable foods in socially acceptable ways. Some food insecure students contact the Campus Food Bank at the University of Alberta to receive food hampers.

This research study aims to understand food insecurity among students with young children who request food hampers from the Campus Food Bank. Knowing more about the reasons for food insecurity among students with children will enable policymakers to make more appropriate decisions regarding post-secondary student funding. Knowing more about its clientele will help the Campus Food Bank to improve the services it provides to students. The Campus Food Bank would also like to know the impact their services have on students.

In a previous study about the Campus Food Bank, you completed a food security survey and agreed to be contacted about future research. We invite you to take part in an interview about your experiences with food insecurity and the services of the Campus Food Bank. The objectives of the study are to:

1. Explore the reasons for using the services of the Campus Food Bank.
2. Understand the challenges to achieving food security among university students with children.
3. Describe the impact of the Campus Food Bank on the quality of your life and that of your children.

4. Understand coping strategies used to deal with food insecurity.
5. Describe the impact of food insecurity on your academic studies and food related behaviors.

Study Procedure

You will meet with a researcher in private. The researcher is a graduate student, Ms. Sarah Lee, at the University of Alberta who is doing her MSc in Human Nutrition. Sarah will ask you questions about the reasons for using the Campus Food Bank, coping strategies when you do not have enough food to eat, challenges to achieving food security, and the impact of the Campus Food Bank on your quality of life, eating behaviors, and academic performance. The interview will take about 1 hour to complete. The interview will be recorded for later analysis. Before the interview begins, you will be asked some demographic and food security questions.

As a token of our appreciation, you will receive a $35 gift card from a local grocery store for participating in this study.

Risks

It is not expected that participation in this study will harm you in any way. If answering some questions makes you feel uneasy, you can choose to not answer them.

Benefits

This study will not have any direct benefits for you. The findings may help to improve the services of the Campus Food Bank for students at the University of Alberta. The findings may also enable policymakers to make better decisions regarding post-secondary funding, loan assistance and tuition costs for U of A students.

Confidentiality

The interview will be digitally recorded. Ms. Lee will type what is said into a document, or a professional transcriptionist might be hired to do this. Your name will be removed from the typed transcripts of the interview. Names and identifying information of you or anyone that you mention will not be included on the written reports from the research, and you will be anonymous in any written and verbal reports of the research. The only people who will have access to the transcripts are the researchers affiliated with the study. A graduate student researcher who is also interviewing students about food security will assist Ms. Lee with data analysis of transcripts once all names are removed. All transcripts will be stored in a locked cabinet at the University of Alberta for five years, after which time they will be destroyed. Electronic data will be kept on password-protected computers of University of Alberta researchers and only researchers affiliated with this project will have access to data collected as part of this study.

Voluntary Participation

You can choose whether to be in this study or not. Your decision to participate will not affect the services that you receive from the Campus Food Bank. If you are willing to participate, you are required to sign the 'Consent Form'. Even if you consent to the study, you can choose at any time to not answer the interview questions. After you complete the interview, if you choose to withdraw from the study all information you provide will be destroyed. Once the information from your transcript has been analyzed with other participants' responses, it cannot be withdrawn from the study.

Use of Your Information

The combined information from all participants of this interview study will appear in a graduate student thesis, reports for the Campus Food Bank, publications, and conference presentations. Neither the thesis nor any of the reports, publications, or presentations about this study will include any identifying information about you; only group data will be presented. If you have any questions or concerns, please contact any of the researchers of this study at the University of Alberta.

Contact Information

If you have any further questions about the study, don't hesitate to contact:

Name	Email	Phone
Dr. Noreen Willows	noreen.willows@ualberta.ca	780-492-3989
Dr. Geoff Ball	geoffball@med.ualberta.ca	780-342-8465
Dr. Anna Farmer	anna.farmer@ualberta.ca	780-492-2693
Ms. Sarah Lee	sdl@ualberta.ca	780-492-8837

If you have any questions or concerns regarding your rights as a participant, or how this study is being conducted, you may contact the Research Ethics Office, at 780-492-2615. This office has no affiliation with the study investigators.

If you wish to participate, please read and sign the 'Consent Form.'

Consent Form

Project Title: Hunger on Campus – Understanding food insecurity among students

Investigators

Dr. Noreen Willows, Associate Professor*	Principal Investigator
Dr. Geoff Ball, Associate Professor[§]	Co-Investigator
Dr. Anna Farmer, Associate Professor[*+]	Co-Investigator
Ms. Sarah Lee*	MSc Student

***** Department of Agricultural, Food and Nutritional Science

[§] Department of Pediatrics

\+ Centre for Health Promotion Studies

Purpose of Research:

The purpose of this research is to explore how food insecurity affects the academic performance, food related behaviors, and coping strategies of university students with children. The study will be conducted in partnership with the Campus Food Bank at the University of Alberta.

Please check 'Yes' or 'No' for each statements below related to the information in the 'Information Sheet'.

	Yes	No
Do you understand that you have been asked to be in a research study?		
Have you read and received a copy of the 'Information Sheet'?		

Do you understand the benefits and risks involved in taking part in this research study?		
Have you had an opportunity to ask questions and discuss this study?		
Do you understand that you are free to withdraw from the study or refuse to answer any question without having to give a reason and without affecting your present or future use of the Campus Food Bank?		
Are you aware that what you say will be kept confidential and in the secure possession of the researchers?		
Do you agree to have this interview audio-recorded?		
Do you agree to anonymous publication of quotations or extracts from your interview?		
Has the issue of confidentiality been explained to you?		
Do you understand that only the research team will have access to the data?		
Do you agree to have information from the questionnaire you previously completed used for descriptive purposes in the present study?		

Have all your questions been answered by the researcher?		
Do you agree to be contacted for future research studies?		

I agree to take part in this study (please circle your response).	Yes No
Participant Name (*please print*):_____	
Signature: _____	Date: _____
(Email): _____	
I have explained this study to the best of my ability to the participant. I believe that informed consent is being provided by the participant.	
Researcher's Signature:	
Sarah Lee: _____	Date: _____

Confirmation of Compensation Receipt

By signing below, I acknowledge that I have received $35 as a token of appreciation for participating in the above study.

Participant's Signature:

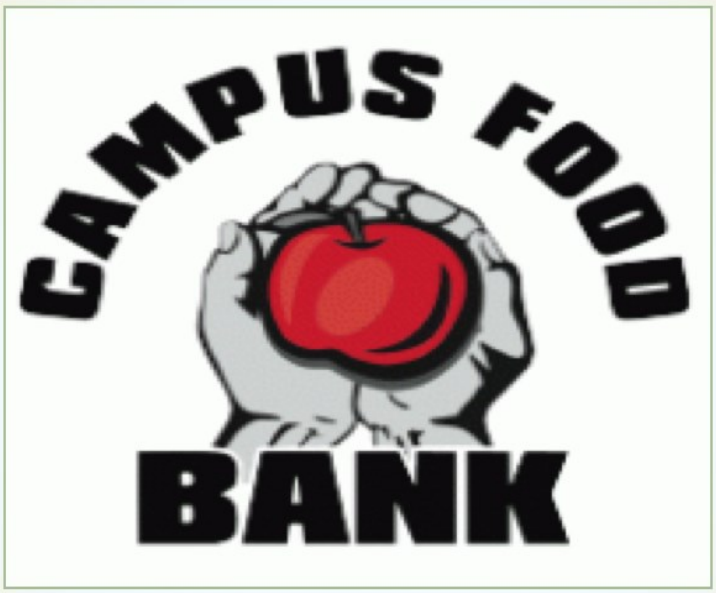
_____

Date (mm/dd/yyyy): _____

Appendix 5: Recruitment Poster

Hunger on Campus – Food insecurity among students

VOLUNTEERS NEEDED FOR RESEARCH!



Are you...

- a University of Alberta student
  AND
- a client of the Campus Food Bank who has received a food hamper?

Then, we invite you to participate in a study to understand the impact of the Campus Food Bank on you, and whether lack of money for food has influenced the quality of your university experience and your health, nutrition and well-being. The study involves two surveys which will take less than one hour of your time to complete. You will receive a $35 grocery store gift card for your time.
To learn more, please email Mahitab (hanbazaz@ualberta.ca) or Jasmine (farahbak@ualberta.ca), or call them at 492-8837.

Appendix 6: Conceptual Framework derived from qualitative research with food-insecure student parents accessing the campus food bank (CFB) at the University of Alberta.