

STUDENT FOOD SECURITY

Exploring Barriers to Health and Education Outcomes at The University of Saskatchewan

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ABSTRACT

This thesis examines the relationship between post-secondary student status and household food insecurity. Food insecurity refers to uncertain or inadequate access to food due to financial constraints. This project aims to examine the demographic factors and household characteristics of students attending the University of Saskatchewan in an attempt to determine if certain characteristics are associated with an increased risk of experiencing food insecurity, and therefore if some students are more vulnerable to becoming food insecure compared to others. This research will also delve into perceptions of potential contributing factors to food insecurity among University of Saskatchewan students, as well as strategies used to manage food shortages, perceptions regarding implications for student health and learning outcomes, and some suggestions to support students who may be at risk of food insecurity.

A sequential, multi-method research design was used. The first phase was a survey sent directly to a simple random sample of 4500 university students through their email (n = 1359, response rate = 30.2%). The results from the survey revealed that 39.5% of students reported some level of food insecurity in the previous twelve months, with 11% reporting marginal, 21% reporting moderate, and 7.5% reporting severe levels of food insecurity. Descriptive prevalence between several student demographic and household characteristics and increased odds of experiencing food insecurity were observed.

The information obtained from the survey data was used to develop an interview guide aimed at further examining the problem. Interviews were conducted with employees at the University of Saskatchewan who work in a student support role (n = 5). The inclusion of interviews facilitated greater depth, richness and rigor to the study design. Thematic analysis of the interviews revealed several themes related to student food insecurity on campus including: (1) factors that may influence food insecurity at the University of Saskatchewan; (2) perceived implications of food insecurity on student learning and health outcomes; (3) coping mechanisms used by students during times of low food security; and (4) suggested strategies that may help reduce food insecurity at the University of Saskatchewan.

The results from this exploratory research, one of the first studies of its kind in Canada, is consistent with what is being found by other studies. Food insecurity among post-secondary

students is a serious public health and equity issue with critical implications for individuals and society. There is a need to better understand the barriers to food security among postsecondary students. Encouragement of other university campuses to engage in similar research projects will allow for intercampus comparisons to be made. The results can be used to guide policy decisions that will create more opportunities for success among post-secondary students.

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CHAPTER 1: INTRODUCTION

1.1 Background

University is a time marked by financial hardship for many, but funding the rising cost of tuition seems to be increasingly unmanageable for Canadian students (Canadian Federation of Students, 2015). Over the past 15 years, the cost of tuition at Canadian universities has steadily increased, while government funding has declined. More students are struggling to meet the costs of education and student debt is higher than ever in the past (2015). The average undergraduate student now carries approximately \$26,000 in student debt upon graduation and the number of students accessing the government student loan program is increasing, indicating that students may be in unstable financial situations (Burley and Awad, 2014).

University student food insecurity is often normalized in western culture. The notion of a student that subsists of cheap, low-quality food is common-place and may be viewed as socially acceptable due to the perceived transient nature of this phenomenon (Burley and Awad, 2014). Research suggests that food security is associated with a student's short-term financial insecurity and that the individual will regain financial and food secure status upon graduation (2014). However, newly emerging research suggests that food insecurity may negatively impact students' health and well-being as well as potentially compromise learning experiences and educational outcomes, the fall-out of which can last well beyond the years spent enrolled in university.

The likelihood of an individual reporting food insecurity increases dramatically as income adequacy declines (Tarasuk and Vozoris, 2003). Individuals who experience food insecurity are also more likely to report poor or fair health, including increased chronic conditions and poorer mental health outcomes (Health Canada, 2014). Experiences of food insecurity, on top of the everyday stresses of university, may hinder students from entering or completing post-secondary education (Tarasuk and Vozoris, 2003). University education attainment is a prerequisite for at least seventy percent of new jobs in Canada and thus is one of the most important contributors to upward economic mobility (Canadian Federation of Students, 2015), therefore, it is important to investigate how prevalent food insecurity currently is among students and which students are the most at-risk. Qualitative research is also required to better

understand the lived experiences of post-secondary students and design more effective interventions and policies on campuses and beyond that can support them during this critical period.

1.2 Purpose of study

Hughes in an article entitled *Food Security: The Skeleton in the University's Closet*, argues that food insecurity in the postsecondary student population has the potential to impact both health and learning, and “should not be considered as an accepted aspect of the impoverished student experience, but as a major student health priority” (Hughes, Serebryanokova, Donaldson and Leveritt, 2011). In order to examine this problem, we must first consider the concept of food security. The most commonly used definition of individual and household level food security came from the 1996 World Food Summit which states that: "Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary need and food preferences for an active and healthy life" (USDA, 2014). In contrast, food insecurity occurs when one or more of these conditions are not met. Canadians who experience food insecurity are uncertain if they will be able to acquire adequate quantity and/or quality of food in socially acceptable ways (Tarasuk and Vozoris, 2003). Food insecurity stems from a lack of financial resources, and is strongly associated with household income (Tarasuk and Vozoris, 2003; USDA, 2014; Health Canada, 2014). Additionally, food security is not a temporally stable condition; food security status can be altered at multiple points in time.

Given the close connection between poverty and food insecurity it seems reasonable that individuals experiencing the financial strain of rising education costs might be more susceptible to the experience of food insecurity when compared to the general population (USDA, 2014; Health Canada, 2014). Given the potential importance of the varying life circumstances of students, this study explores the complex interactions between personal and environmental characteristics that may put some students at a greater risk of experiencing food insecurity compared with the broader Canadian population. In addition, the use of multiple data sources to examine the problem is important in order to uncover the complex experiences within this diverse sub-population.

Using a sequential multi-methods study design this research project examines and describes student demographic and living situation characteristics and food insecurity status at the University of Saskatchewan. Quantitative measures are employed to obtain a breadth of data, following which qualitative research is conducted to contextualize the observed correlations (Public Health Agency of Canada, 2015). By incorporating multiple data sources, this study aims to understand perceptions of barriers to food access, what coping mechanisms students may be using during times of food insecurity and what the potential health and education impacts of food insecurity may be. This study will support improvements to health policy and practice on university campuses by gathering research regarding how food insecurity and other factors may interact to create complex challenges that inhibit student success. This study may also act as a guide for other universities across Canada hoping to engage in similar research on their campuses.

1.3 Problem Statement

Research on student food insecurity is currently in its infancy but initial results are staggering with studies reporting prevalence rates two to three times national averages (Public Health Agency of Canada, 2015 ; Chaparro, Zaghloul, Holck and Dobbs, 2009; Hughes, Serebryanokova, Donaldson and Leveritt, 2011; Freudenberg, Manzo, Mongiello, Jones, Boeri and Lamberson, 2011; Patton-Lopez, Lopez-Ceyallos, Canceltirado and Vazquez, 2013; Booth, Anderson, 2016; Morris, Smith, Davis and Null, 2016; Maynard, 2016). As student poverty rates continue to rise across Canada, contextualized research is needed to inform health policy on campuses (Tarasuk and Vozoris, 2003). While most of the research to date seeks to quantify the prevalence of food insecurity on university campuses, little investigates the described experiences of student food insecurity or the perceived barriers to food security on campus (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). The inclusion of qualitative interview data to complement quantitative survey responses may help to increase understanding of this complex and multifaceted problem.

1.4 Theoretical Principle

This project uses a multi-method sequential explanatory approach; primarily using quantitative data augmented by thematic analysis and qualitative semi-structured interviews

(Health Canada, 2014; Brewer and Hunter, 1989; Morse, 1991; Jick, 1979; Rice and Ezzy, 1999; Cresswell, 2007; Joffe and Yardley, 2004). The project seeks to measure and understand food insecurity and barriers that are facing students at the University of Saskatchewan. By using more than one method within a research project the researcher is able to obtain a more complex picture of human behavior and experience (Morse, 2003). This study is a multi-method design, which refers to the conduct of two or research methods, each rigorous and complete in itself, within one research project (Morse, 2003). This is different than mixed methods research which is a subset of a multimethod design that refers to the incorporation of various qualitative and quantitative strategies in a single project that may be driven by an overall qualitative or quantitative theory (Morse, 2003).

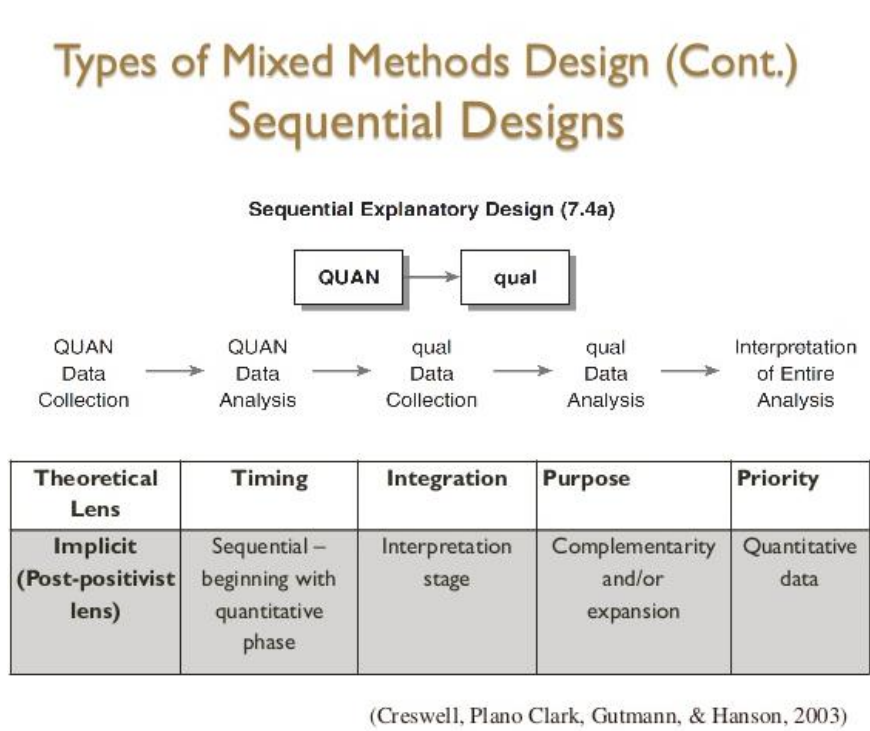


Figure 1. Research design model (Creswell, Plano Clark, Gutmann and Hanson, 2003).

Quantitative measures remain the focus of this study as they are useful to collect broad data in the population as a whole and get an understanding of the severity of the problem. However, there is a risk of oversimplification of complex correlations that could arise from using quantitative survey data alone (Creswell et al, 2003, Morse, 1991). The student body represents

diverse groups of individuals who self-administered the survey, therefore there is a possibility of confounding results. Incorporating additional qualitative data into the study allows for a more complete analysis of the complex interactions between students and food access and food insecurity, as well as the supports and barriers situated on the campus. Methodologically, this involves analysis of data gathered through an online survey and through subsequent semi-structured interviews (Creswell et al, 2003, Morse, 1991).

1.5 Using the Social Ecological Framework

This research project used the Social-Ecological Framework to understand the factors that underpin food insecurity in the university student population. This framework considers the complex interplay between intrapersonal, interpersonal, community/institution and greater societal/policy factors (Centers for Disease Control and Prevention, 2015). The overlapping rings illustrate how the factors at one level influence the factors in another level and how it is necessary to act across multiple levels at the same time in order to design effective interventions. This model is useful for considering food insecurity among students due to the diverse population of interest, or community, comprised of many intra and interpersonal factors that must be considered. Figure 2 outlines some of the various influencing factors at each level:

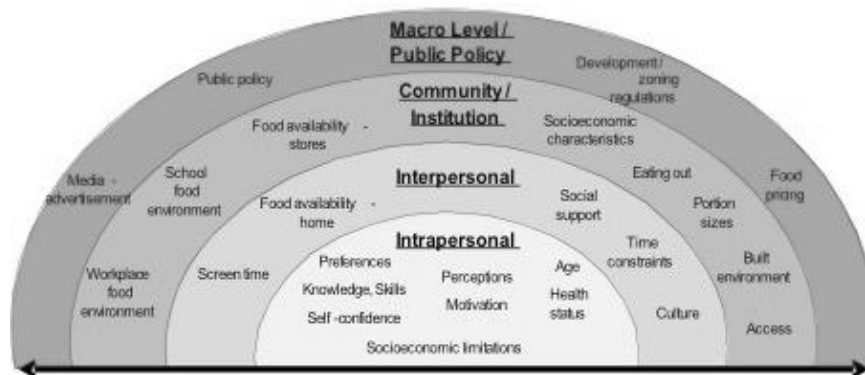


Figure 2. Social Ecological Framework (Centers for Disease Control and Prevention, 2015).

1.6 Research Questions

The research questions listed are answered in a sequential order:

1. What is the current prevalence of food security among students attending the University of Saskatchewan? (QUAN)
2. Does a relationship exist between student demographic characteristics and household food security status among University of Saskatchewan students? (QUAN)
3. What coping strategies are most commonly used by postsecondary students at the University of Saskatchewan to manage periods of food insecurity or perceived potential food insecurity? (QUAN/QUAL)
4. What are the daily experiences and potential implications of food insecurity at the University of Saskatchewan:
 - 4.1. According to students who experience food insecurity? (QUAN)
 - 4.2. According to student support service providers? (QUAL)

1.7 Hypothesis

Due to the uniqueness of a multi-methods study design for examining food insecurity it is difficult to draw upon previous research in order to suggest a hypothesis (Creswell, 2007; Morse, 1991). That being said, emerging literature does suggest that certain characteristics of university life are significant predictors of food security status (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). It is predicted that being a student is related to an increased risk of food insecurity when compared to the general public (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). Given the trends seen in national data it is also expected that certain student demographic characteristics will be correlated with increased risk food insecurity compared with other students. For example, students The research questions listed are answered in a sequential order:

5. What is the current prevalence of food security among students attending the University of Saskatchewan? (QUAN)
6. Does a relationship exist between student demographic characteristics and household food security status among University of Saskatchewan students? (QUAN)
7. What coping strategies are most commonly used by postsecondary students at the University of Saskatchewan to manage periods of food insecurity or perceived potential food insecurity? (QUAN/QUAL)

8. What are the daily experiences and potential implications of food insecurity at the University of Saskatchewan:

8.1. According to students who experience food insecurity? (QUAN)

8.2. According to student support service providers? (QUAL)

who are parents or students who identify as Indigenous may have higher rates of food insecurity (Chaparro et al., 2009; Tarasuk, Mitchell, and Dachner, 2012; Pampalon, Hamel, Gamache and Raymond, 2009; Loppie and Wien, 2009). The qualitative interviews are expected to elaborate the kinds of barriers to food security that are associated with student status.

1.8 Considerations for a Multi Method Study

A multi-methods study design was the approach chosen in an effort to bridge some of the gaps noticed in previous research, as well as to reduce potential for confounding or oversimplification from a quantitative study alone (Creswell, 2011; Morse, 1991; Hessay-Biber and Leavy, 2011). Quantitative measures can elucidate the risk and relationship between variables when compared to the outcome measure of food insecurity, however given the diversity of this sub-population, it would be likely that incorrect assumptions may arise from quantitative measures alone. By combining the student survey data with student support service providers' views and ideas, this study hopes to reveal the factors underpinning barriers to food security for students more thoroughly than previous research on this topic.

1.9 Importance

There is a need to understand 'how' and 'why' students become food insecure in order to address the problem. According to the literature, the scope and experience of postsecondary student food insecurity is not well understood (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016; Maynard, 2016; Tarasuk, Mitchell, and Dachner, 2012; Pampalon, Hamel, Gamache and Raymond, 2009; Loppie and Wien, 2009). Currently there are a limited number of studies on the topic and almost none of this research has been conducted in Canada (USDA, 2014; Booth and Anderson, 2016; Loppie and Wien, 2009; Nugent, 2011; Meldrum and Willows, 2006; Jessri, Abedi, Wong and Eslamian, 2014). The need for this study was justified not only in light of limited research but also because the situation at hand may be perpetuating social and economic disparities in Canada (Public

Health Agency of Canada, 2015; Tarasuk et al, 2012; Nugent, 2011; Meldrum and Willows, 2006; Jessri, Abedi, Wong and Eslamian, 2014, Collins and Paul, 2009). Ultimately, university and broader policy should address potential health inequities among postsecondary students.

CHAPTER 2: LITERATURE REVIEW

1.10 Background

The purpose of this review is to assess the current body of literature regarding food insecurity amongst post-secondary students. In order to unpack the complexity of this I will first provide some background information on poverty in Canada, as well as a description of adult household food insecurity in the Canadian population. I will then describe the changing economic climate in Canadian universities and how students might be at an increased risk of experiencing food insecurity due to financial strain. I will include a summary of studies that have been conducted to date, making explicit the gap in knowledge that exists regarding this sub-population. Finally, I will describe strategies that universities are currently using as a social safety net for students, and comment on the adequacy of these interventions.

Current literature exploring post-secondary student food insecurity has only recently begun to emerge. There are very few studies published that are specific to food issues facing Canadian students, and there are few studies that measure the prevalence of food insecurity on Canadian university campuses in Canada (Booth and Anderson, 2016; Loppie and Wien, 2009; Nugent, 2011; Meldrum and Willows, 2006; Jessri et al, 2014). Despite the fact that this research is in its infancy, the initial findings do indicate a significant problem that requires attention and further investigation.

1.11 Defining Poverty in a Canadian Context

As previously stated, income inadequacy and food insecurity are tightly connected, and a better understanding of poverty may help to illuminate risk factors associated with food insecurity (Tarasuk and Vozoris, 2015; Tarasuk et al, 2012; Pampalon et al, 2009; Collins and Paul, 2009; Raphael, 2001). Poverty is difficult to define and is highly contextual (Tarasuk and Vozoris, 2015; Collins and Paul, 2009; Raphael, 2001). Canada is a wealthy nation therefore within this context, poverty may be understood as “the experience of material and social deprivation that prevents individuals and communities and even whole societies from reaching their full human and societal potential” (Raphael, 2001). The experience of poverty has the potential to limit an individual’s ability to participate in social, educational, cultural or political activities; exclusion from these activities may have damaging consequences, not only at an

individual level but in terms of the health, economics, ethics and development of a country (Raphael, 2001). While there is no official measure of poverty in Canada, Statistics Canada's Low Income Measure (LIM) is commonly used in Canada and for making international comparisons (Tarasuk and Vozoris, 2015; Collins and Paul, 2009; Raphael, 2001). The LIM is 50% of median household income, adjusted for household size to take into account that a household's needs increase with additional members (Tarasuk and Vozoris, 2015; Collins and Paul, 2009; Raphael, 2001). A report released by the Canadian Senate entitled *In from the Margins* identifies factors contributing to poverty in Canada: unaffordable housing was listed as a key factor (Collins and Paul, 2009). Other risk factors included "racism, gender discrimination, violence, divorce, illness, accidents, low wages, lack of education and skills, and having children" (Collins and Paul, 2009). The authors stated that poverty is not random; some individuals are disproportionately represented as experiencing social and economic distress in Canada, including Aboriginal people, people with disabilities, lone parents (primarily women) and new Canadians, and these groups are more likely to experience poverty for a longer period of time (Loppie and Wien, 2009; Raphael, 2001). The researchers also stated that "poverty was caused by a combination of personal situations but more by systematic factors" which could include the ability to complete one's education (Tarasuk and Vozoris, 2015; Tarasuk et al, 2012; Pampalon et al, 2009; Collins and Paul, 2009; Raphael, 2001).

Factors influencing poverty may vary between provinces in Canada. For example, minimum wage is set by each individual province. In Saskatchewan the current minimum wage is \$10.72/hour (ref). However, a fulltime wage at this rate is not enough to move an individual above the poverty line. Living wage refers to the basic wage that would allow for someone to afford basic necessities such as food and housing. Living wage varies between regions. In Saskatoon, where the University of Saskatchewan is located, the living wage is currently \$16.77/hour (Blante and Raddou, 2015). Many university students are in the beginning phases of building their careers and therefore are accessing entry-level jobs that primarily pay minimum wage. The student rate of pay for undergraduate students at the University of Saskatchewan current ranges from \$11.24/hour to \$15.15/hour based on year of study (University of Saskatchewan, 2015). While this rate is above minimum wage, is it still not adequately providing a living wage for this region. Therefore, many students who are accessing entry-level and

university-based jobs may not be able to access an income that can adequately support their basic needs, which may be contributing to food insecurity.

1.12 Food Security as a Social Determinants of Health

Social Determinants of Health (SDH) are economic and social conditions that impact an individual's predicted health outcomes (Public Health Agency of Canada, 2015). There are twelve recognized SDH which include income, education, housing, employment as well as health and social services, to name a few. Each of these determinants is complex and interrelated. Within the framework, food security stands as one of the 12 SDH (Public Health Agency of Canada, 2015). As previously stated, the most commonly used definition of individual and household level food security came from the 1996 World Food Summit: "Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (USDA, 2014). In contrast, food insecurity occurs when one or more of these conditions are not met. Canadians who experience food insecurity are uncertain if they are able to acquire adequate quantity and/or quality of food in socially acceptable ways (Tarasuk and Vozoris, 2003; USDA, 2014; Health Canada, 2014). Food insecurity is defined as stemming from a lack of money, and is strongly associated with household income (Tarasuk and Vozoris, 2003; Health Canada, 2014; Tarasuk et al, 2012). The lower household income is in relation to the LIM, the greater the likelihood of severe food insecurity (Tarasuk and Vozoris, 2003; Health Canada, 2014; Tarasuk et al, 2012). In 2012, 45.3% of households with incomes under half of the LIM were food insecure (Tarasuk et al, 2012; Raphael, 2001).

Given the close connection between poverty and food insecurity, it seems reasonable that individuals struggling with the basic costs of living and tuition might be more likely to experience food insecurity when compared to the general population (USDA, 2014; Health Canada, 2014). Research regarding how food insecurity and other factors may interact to create complex challenges that inhibit student success is required. Additionally, investigation into how well current Canadian policies and programs are responding to students who are experiencing food insecurity is critical to supporting equal access to post-secondary education.

1.13 Current Trends in Post-Secondary Education

The cost of undergraduate tuition has grown markedly over the past fifteen years, outpacing the rate of inflation by five times (Canadian Federation of Students, 2015). The average annual cost of tuition in 1991- 1992 was \$1,706, and by 2013-2014 the average annual cost of tuition had increased 238% to \$5,772. In Saskatchewan tuition has increased 244% from 1990/91 to 2013/14 while government funding has declined (2015). Nationally, between 1979 and 2009, "the proportion of university operating revenue provided by government sources has declined from 84% to 58% while the proportion funded by student tuition fees has increased from 12% to 35%" (Canadian Federation of Students, 2015). This dramatic increase in tuition, combined with a decrease in government funding, has resulted in unprecedented levels of student debt (Burley and Awad, 2014). The number of student loans issued between 1990 and 2014 increased by 95% (Burley and Awad, 2014). In 2013-2014 almost 425,000 Canadian students borrowed money in order to finance their education (Canadian Federation of Students, 2015). In September 2010, the total amount of student loans owed to the government reached \$15 billion, the "legislated ceiling set by the Canada Student Financial Assistance Act" (Burley and Awad, 2014). This act was amended twice over the following years to allow the current limit to increase, finally resting at \$19 billion (Burely and Awad, 2014). These dramatic changes within our current education system are creating a precarious balance and placing an enormous debt burden on current university students, with the average undergraduate student having approximately \$26,000 in student debt upon graduating.

1.14 Perpetuating Social and Economic Disparity

Current education trends may be perpetuating social and economic disparities among the Canadian population. The rising cost of post-secondary education has created limited access for students from low- and middle-income backgrounds (Canadian Federation of Students, 2015). Statistics Canada revealed that students from low-income families are less than half as likely as those from high-income households to pursue a university education (Tarasuk et al, 2012). Statistics Canada has also found that the most frequently-reported reason high school students did not pursue post-secondary education was financial (Public Health Agency of Canada, 2015). Despite these findings, tuition fees remain the same for (almost) all students, regardless of their financial support network (Burley and Awad, 2014). This could be creating a further divide in

income distribution in Canada. Aaron Palas (2009) spoke to this in his article entitled *Education Participation across the Life Course: Do the Rich get Richer?* stating that “over the dozen years beyond tenth-grade enrolment, substantial numbers of individuals were deflected upward and downward, and these deflections cumulated so that the variation in relative positioning in the stratification system increased over time” (p. 330). Given that at least 70 percent of new jobs in Canada require some form of post-secondary education, higher education is increasingly becoming a prerequisite for participating in the labour market and for earning an average income (Canadian Federation of Students, 2015). This reveals that it is important to consider the provision of supports that allow increased student retention for those who have academic potential but do not have the financial backing to make post-secondary education a reality. If financial pressure is on the rise for this sub-population of Canadians, it is likely that food insecurity is also increasing, given the tight connection between these two SDH (Health Canada, 2014).

1.15 Food Insecurity in Canada

Information on the prevalence and severity of food insecurity is generally collected using the United States Household Food Security Survey Module (U.S. HFSSM) a validated, quantitative, 18 item survey instrument (USDA, 2015; Health Canada, 2014). The measurement of food security is derived from multiple indicator questions, which put individuals into one of four categories of food insecurity: high food security, marginal food security, low food security, very low food security (Health Canada, 2014). High food security indicates that the household has no anxiety about their ability to access food; marginal food security indicates the that household has had anxiety about accessing adequate food, but the quality, variety, and quantity of their food intake were not substantially reduced; low food security suggests that the households reduced the quality, variety, and desirability of their diets, but the quantity of food intake and normal eating patterns were not substantially disrupted; the most severe category is very low food security indicating that one or more household members were not able to afford or access adequate or acceptable food intake (Health Canada, 2014).

Measurement of household food insecurity has been conducted through the Canadian Community Health Survey (CCHS) since 2005. The food insecurity measurement questions are modified from the United States Department of Agriculture (USDA) Household Food Security

Survey Module (HFSSM) measurement tool (PROOF, 2016). In analyzing that CCHS data, Health Canada uses a three category reporting system where households are classified as food secure (answering positively to one or no questions), food insecure moderate (answering positively to two to five questions), and food insecure, severe (indicating a positive response to six or more questions) (2014). The PROOF food security research team have been using the same data from the CCHS but they use a four category reporting system as food secure (no positive answers), Food insecure, marginal (answering positively to one of the survey questions), food insecure moderate (answering positively to two to five questions), and food insecure, severe (indicating a positive response to six or more questions), which is consistent with the categorization used in the United States. PROOF (and others) argue that answering yes to even one question in the module is linked to health and other problems and therefore, the separate category is justified (PROOF, 2016). This four category reporting is used in this study also. According to the PROOF categorization, approximately 3.7% of Canadians experienced marginal, 5.5% experienced moderate, and 2.7% experienced severe food insecurity in the past twelve months based on the 2014 CCHS survey data (Health Canada, 2014; PROOF 2016). Food insecurity does not affect all members of the Canadian population equally. Canadians living in the north experience the highest rates of food insecurity, with Nunavut having an astounding 46.8% of households experiencing food insecurity (Health Canada, 2014). Other households that disproportionately experience food insecurity include those who depend on government assistance as their main source of income, with 60.9% of households reporting some level of food insecurity compared with households with an alternate main source of income. Lone-parent families headed by females reported rates of household food insecurity at 33.5% in 2013–2014, with couples with no children experiencing the lowest rate of food insecurity at 5.2% (PROOF, 2016). Additionally, 25.7% of Aboriginal households and 15.4% of new immigrants (less than five years) experienced food insecurity in 2013-2014 households (PROOF, 2016; Tarasuk et al, 2012; Loppie and Wien, 2009). Currently it is not known if these differences in food insecurity status are reflected in post-secondary students.

1.16 Post-Secondary Food Insecurity Studies to Date

One of the earliest studies that sought to understand food insecurity among post-secondary students was conducted by M. Pia Chaparro at the University of Mānoa in Hawaii

(UHM). The objectives of the study were to assess the prevalence of food insecurity among students at UHM and to identify possible predictors of food insecurity in this population (Chaparro et al, 2009). Food security was measured using the United States measure; HFSSM questions were included in a survey that was distributed to students in 31 classes. 401 responses were received, which represented 1.9% of the total university population (n= 20,644) (Chaparro et al, 2009). The prevalence of food insecurity among UHM students surveyed was found to be 21% (n=85), with 15% (n=61) having low food security and 6% (n=24) having very low food security, according to the four category measurement used in the United States (Chaparro et al, 2009). Possible predictors of food insecurity were not included in the results as the researchers determined that survey questions used to assess the predictors were not standardized and may have included biases (Chaparro et al, 2009).

An article published by researchers from Queensland University in Australia entitled: *Student food security: The skeleton in the university closet* sought to identify and describe the severity and prevalence of student food insecurity on campus (Hughes et al, 2011). Hughes et al argued that food insecurity in post-secondary populations “has the potential to impact both health and learning and should be considered a major student health priority” (2011). In order to understand the student experience of food insecurity the research team administered a cross-sectional self-administered questionnaire. Food insecurity measurement items were derived from the United State HFSSM survey and the full survey also included questions from the Australian National Nutrition Survey (NNS). The survey was used to determine the prevalence, distribution, and severity of food insecurity, as well as behavioural adaptations students had adopted to meet their food needs (Hughes et al, 2011). Researchers aimed to recruit approximately 400 students using heterogeneous purposive sampling (Hughes et al, 2011). 399 students completed the survey representing 3% of all students who were attending Queensland University (n = 13,800) (Hughes et al, 2011). Various analyses were conducted; a single item measure of food insecurity indicated a prevalence of food insecurity of 12.7% (Hughes et al, 2011). A second multi-item measurement of food security revealed that 46.6% of participants experienced some degree of food insecurity (Hughes et al, 2011). Approximately one quarter of students experienced more extreme levels of food insecurity, which included hunger.

The survey also explored coping strategies developed by students that focused on income generation and austerity measures, including living with parents, working more than 10 hours per week outside of university and borrowing money and food (Hughes et al, 2011). Students who reported food insecurity were more likely to rate their overall health status lower than those who were food secure. The researchers concluded that university students are at significant risk of food insecurity in part attributed to inadequate income support (Hughes et al, 2011). They stated that further research is required to assess the broader determinants of food insecurity and appropriate strategy responses, including social support policies, in this population group (Hughes et al, 2011).

A similar exploratory survey was administered by researchers to assess undergraduate food security at the City University of New York (CUNY) (Freudenberg et al, 2011). The survey questions were developed by the research team and include four questions to assess food security based on the HFSSM survey, as well as housing instability over the previous 12 months.

The first round of the survey was administered to a sample of 6,883 CUNY undergraduate students from 16 campuses in two phases (Freudenberg et al, 2011). The first round of the survey, labeled the CUNY Representative Sample, was carried out by Baruch College Survey Research (BCSR) on behalf of the Healthy CUNY investigators. BCSR staff administered the survey via Internet or telephone to a sample of 1,086 CUNY undergraduate students recruited to match all CUNY undergraduates by gender, age, race/ethnicity, cumulative grade point average, college, type of college, and class standing (Freudenberg et al, 2011). The sample included respondents from all 17 CUNY community college and four-year schools where undergraduates are enrolled (Freudenberg et al, 2011). The second round of the survey, labeled as the CUNY Targeted Sample, was administered by trained CUNY students, who distributed and collected the surveys in person to students on the eight campuses with the highest rates of students receiving public assistance (Freudenberg et al, 2011). This sample includes 1,114 students from Boroughs of Manhattan, Bronx, Hostos, Kingsborough, La Guardia, and Queensborough Community Colleges, and John Jay and Medgar Evers Colleges, both of which are four-year schools (Freudenberg et al, 2011). While this sample was not representative of all CUNY students, the researchers justified this method, stating that it allowed for comparisons between higher need campuses with all campuses and to ascertain whether the needs of students

who were reached by face-to-face encounters were significantly different than those of students were reached by telephone or online (Freudenberg et al, 2011).

The survey received a 15.7% response rate. The research team defined a student as food insecure if he or she answered “often” or “sometimes” to two or more of the four questions subset of the HFSSM survey. Based on this definition, the survey showed that 39.2% of CUNY students reported that they experienced food insecurity in the previous 12 months (Freudenberg et al, 2011). Some populations of CUNY students had significantly higher rates of food insecurity than others. For example, Black and Latino students were about 1.5 times more likely to report food insecurity than White and Asian students (Freudenberg et al, 2011). Students reporting household incomes of less than \$20,000 a year (about 26% of all CUNY undergraduates) were more than twice as likely to report food insecurity as those with household incomes of more than \$50,000 a year (Freudenberg et al, 2011). Students who supported themselves financially were 1.6 times more likely to report food insecurity compared to those not supporting themselves (Freudenberg et al, 2011). Students working more than 20 hours per week had a higher rate of food insecurity than those who did not work (Freudenberg et al, 2011). Researchers concluded that food insecurity disproportionately affects certain student populations and that more research is required to understand what support systems colleges can put in place to ensure equal opportunity and success for all students.

A recent study in the United States was conducted at a mid-sized rural university in Oregon by Patton-Lopez, Lopez-Cevallo, Cancel-Tirado and Vazquez (2013). The researchers administered a cross-sectional survey to the entire student body of 5,438 students and received a response rate of 7% of the student body (Patton-Lopez et al, 2013). The outcome of interest, food security, was measured using the HFSSM 6-item short form survey. The responses to the 6-question scale were categorized into a dichotomous variable of food insecure or food secure (Patton-Lopez et al, 2013). Researchers found the prevalence of food insecurity to be 59% of the sample, which was higher than in both the general population as well as other university populations that have been measured (eg, 39% among students at the City University of New York; 45% among students at the University of Hawai'i at Manoa) (Chaparro et al, 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez et al, 2013). This study offered a unique perspective in terms of the rural environment. The physical isolation of this environment may

have limited students' social support networks and resulted in the higher prevalence of food insecurity that was seen in this study (Patton-Lopez et al, 2013). However, this study had limitations, including a low response rate and a cross-sectional design that relied on students' self-report which may increase response bias.

A thesis published recently at University of Northern British Columbia (UNBC), investigated food security among UNBS students as well as the greater university community, including UNBC academic staff and faculty members (2016). Data collection was undertaken during the Fall Semester of 2015, using two primary methods: semi-structured interviews with key UNBC informants identified both through local knowledge and through snowball techniques, followed by a web-based survey (Booth and Anderson, 2016). Interview questions focused on perceived food insecurity amongst the different population groups on campus as well as factors contributing to food insecurity. Interviews were recorded and were analyzed using a type of thematic analysis (Booth and Anderson, 2016). Interview results were used to develop a web-based survey utilizing both closed and open ended questions (Booth and Anderson, 2016). The survey was promoted by having groups forward the survey to their membership, an article published on the study in the student newspaper, posters around the university and 4 days at a table in a central location where students could complete the survey. The survey was active for five weeks with email reminders sent out twice. The survey received a response rate of 7% from students. Survey questions included a range of demographic questions, questions related to food insecurity and personal risk factors, as well as options for addressing community food insecurity. Other questions assessed the campus food contractor's operations. The study results found that food insecurity levels were high, affecting 39% of UNBC's students, 39% of UNBC academic staff, and 48% of its faculty members (Booth and Anderson, 2016). These rates are significantly higher than in the general population of British Columbia where 11.9% of households face some level of food insecurity (Booth and Anderson, 2016). While they found that factors affecting food insecurity varied across the university populations, among students, poverty was a major factor while for faculty time was a major issue, and staff suffered from both. They found that 13% of academic staff, 15% of faculty and 40% of students could not perform at their best as learners, teachers or facilitators due to food insecurity (Booth and Anderson, 2016). In addition to financial pressure and time constraints the researchers also concluded that UNBC exists in a "food desert" and those on campus rely on campus food outlets, which operate under contract by

an international corporation (Booth and Anderson, 2016). That contract restricts outside food provision in all but the student union building and creates an environment with inflated food prices (Booth and Anderson, 2016). The UNBC study concluded that the factors contributing to food insecurity on campus were undermining the university community from reaching its teaching and learning potential and therefore the issue of food insecurity needs to be addressed (Booth and Anderson, 2016).

Earlier this year, data collected from 1,882 undergraduate students across four public Illinois universities determined a food insecurity rate of 35% (Morris et al, 2016). This study used a cross-sectional survey design and included variables such as age, sex, race, and academic standing. Statistical analysis was conducted using frequency measures and chi-square (Morris et al, 2016). It was found that a significant relationship existed between food security status and certain socio-demographic factors such as race, grades, loan use and living location (Morris et al, 2016).

Recently a thesis was published by Merryn Marnard entitled *Experiences of Food Insecurity Among Undergraduate Students at the University of Waterloo: Barriers, Coping Strategies, and Perceived Health and Academic Outcomes* (2016). This study used a mixed methods design, in which semi-structured interviews were complemented by a health survey that included the HFSSM measure for adult food security. This study used purposeful sampling of students who had been recruited using flyers posted on campus and at the student food bank. Students were screened to meet the specified selection criteria (n=14).

Marnard found that students encountered barriers to food access and healthy food options primarily because of financial limitations but also as a result of the food environment, lacking food literacy and time constraints. This study concluded that post-secondary food insecurity is a serious issue with critical implications and needs to be address through strategies that examine the root financial causes (2016).

Although not peer reviewed, Meal Exchange released the *Hungry for Knowledge Report* in October 2016 which looked at the income-related food insecurity of students at five university campuses in Canada: Ryerson University, Brock University, Dalhousie University, Lakehead University, and the University of Calgary. Each institution was chosen based on geographic location, the absence of existing or planned student food insecurity studies, academic and student

relationships, and regional differences. This study used a quantitative survey with the ten question HFSSM measurement tool embedded in the questions to determine the prevalence and correlated demographic factors contributing to food insecurity on Canadian campuses. The study found that approximately 39% of students sampled had experienced some food insecurity in the past twelve months (n=1564). Barriers contributing to food insecurity were identified as primarily being income-related such as the high cost of food, the cost of tuition, and the high cost of living. Students who lived with extended family or lived at home with their parents were the least likely to experience food insecurity at 15.9% and 23.0%. One in four (23.7%) food insecure students reported that their physical health was affected by food insecurity, while slightly less (20.1%) reported that their mental health had been impacted (2016). Although this study had limitation in the design, including self-selected sampling methods, rather than a simple random sample, the report concluded that food insecurity on Canadian university campuses is a serious issue and more needs to be done to support students who are the most vulnerable to experiencing income-related food insecurity (2016).

A summary of the peer-reviewed, quantitative studies conducted to date is provided below in a Table 1. It is important to note that although the type of sampling used may present bias in the data due to sample size or non-random sampling methods. For this reason the response rate for students who completed the survey and the reflection of this number compare the total number of students attending the university are provided in two separate columns.

Table 1 A Summary of Study Designs and Outcomes

Post Secondary Institution	Year	Type of Sampling	Method	Response % Total Students	Measurement Tool	Prevalence
University of Mānoa in Hawaii	2009	Purposeful	Cross-sectional, self-reported survey, administered in lectures	1.9%	10-item Adult HFSSM survey	21%
Queensland University	2011	Purposeful	Cross-sectional, self-reported survey; purposeful sample at events	3%	NNS and 4-Item Short For of the HFSSM survey	12.7% (using NNS) 36.3% (using HFSSM)
CUNY	2011	Phase 1: Simple random sample Phase 2: Purposeful	Phase 1 (representative sample): telephone interviews and email Phase 2 (targeted sample): in person by trained personnel	0.4%	4-Item Short form of the HFSSM survey	Average of two rounds 39.2%
Rural University in Oregon	2014	Simple Random Sample	Cross-sectional, self-reported survey; email	7%	6-Item Short Form of HFSSM survey	59%
UNBC	2016	Simple Random Sample	Interviews, followed by online, cross-sectional, self-reported survey	7%	10 question CCHS survey	39%
ILLINOIS	2016	Simple Random Sample	Online, cross-sectional, self-reported survey		6-Item Short Form of HFSSM survey	35%

1.17 Health implications of food insecurity

A growing body of literature has documented the effects of food insecurity on cognitive, academic, and psychosocial development among adolescents. These studies consistently observe that food insecurity is associated with lower academic performance, poorer health, and decreased psychosocial functioning (Tarasuk and Vozoris, 2003; Tarasuk et al, 2012; DeVilbiss, 2014). Links between academic performance and good nutrition have been well studied among children

and find that children who are well nourished show improved academic outcomes and have increased ability to concentrate compared with children who are undernourished. This same effect has not yet been directly measured in the population of university students but seems plausible (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016).

Looking past academic success, Tarasuk et al. (2012) state "individuals in households characterized by food insufficiency had significantly higher odds of reporting poor/fair health, of having poor functional health, restricted activity, multiple chronic conditions, of suffering from major depression and distress, and of having poor social support" (p.120). Studies support that when individuals feel as though their money may run out they will sacrifice food quality for cost savings, contributing to the risk of obesity (Tarasuk et al, 2012). Household food insecurity is as an excellent predictor of Canadians reporting fair or poor health, compared with the rest of the population (Tarasuk et al, 2012). Specifically, Tarasuk reports that food insufficient households were "80% more likely to report having diabetes, 60% more likely to report having high blood pressure and 70% more likely to report food allergies compared with household with sufficient food" (123). If extrapolated to the student population, these statistics suggest that the financial stress of university may be contributing to lack of academic success among students and increasing their risk of chronic illness.

1.18 University Food Environments

Although not the focus of this research and so considered only briefly, it is worth mentioning some of the unique characteristics of campus food environments and how these relate to food security. The University of Saskatchewan main campus is located several kilometers from the nearest grocery store. Research shows that residents pay more for groceries in areas with poor supermarket access; healthy foods like fruits and vegetables are scarcer and prices are higher at smaller retailers than at supermarkets (Sooman et al., 1993; Barratt, 1997; Chung and Myers, 1999; Latham and Moffat, 2007). Consequently, studies have suggested that supermarket access translates into better diets and health, while greater exposure to fast food restaurants promotes unhealthy eating and obesity-related health problems (Reidpath et al., 2002; Morland et al., 2002; Zenk et al., 2005). While the majority of studies have been

conducted in the US or UK, more research is needed to determine how food access impacts residents of Canadian cities, and specifically within an environment of a university campus.

1.19 Current social supports in place for students:

1.19.1 Student Loans

Canada Student Loans and Grants Programs may be considered as a part of the Canadian social safety net put in place to help students who cannot afford the cost of a post-secondary education. Students have the opportunity to apply for and receive financial support during their education, but there are questions about the adequacy of these loans in supporting students to meet the steep price tag of post-secondary education. In terms of deciding who qualifies for a student loan, and how much money an individual student receives, the Canadian Association of Student Associations believes that the current assessment system is unfair (Burley and Awad, 2014). They argue that the current expectation of parental and spousal funding contributions to a student's education costs is unreasonable, that the amount of money allocated to students is not enough to meet a healthy living standard, and that the current loan interest rates, after graduation, are too high (Canadian Federation of Students, 2015).

Researchers Meldrum and Willows investigated student loan adequacy as a predictor of food security risk at the University of Alberta. To test their theory the researchers designed a nutritious seven-day menu (2006). The menu was priced for skilled and unskilled shoppers at a grocery store near to campus and a discount-style grocery store further away (Meldrum and Willows, 2006). The cost of the groceries for the menu was compared to the amount that student loans allocated to food costs each month (\$196) (Meldrum and Willows, 2006). The results of the study indicated that the cost of purchasing nutritious foods often exceeded the amount provided through student loan funding (Meldrum and Willows, 2006). The authors concluded that shopping skills and budgeting, while important, would be insufficient to alleviate food insecurity for many students who require financial aid and recommended that increased funding for food in student loans is necessary (Meldrum and Willows, 2006).

1.19.2 Campus Food Banks

Aside from student loan support, some universities have formed campus food banks to meet the food needs of students. Food banks are the result of community-level response to food

insecurity and are largely un-aided by government support. Like many community-based initiatives, food banks operate under a charity model and are designed as a temporary model for support during transitional times of financial and food insecurity. However, questions have been raised about these, mostly focused on their nutritional adequacy as well as other considerations, such as the social and psychological implications of accessing foods through charitable resources. A study by Willows and Au (2007), conducted at the University of Alberta campus, suggests that student food needs are not entirely met by these food banks. Hampers with a four-day food supply for adults and hampers designed for families with one adult and one child were assessed (Willows and Au, 2007). Two types of hampers were considered, one with only non-perishable items and one that contained both perishable (provided when available) and non-perishable items (Willows and Au, 2007). The researchers found that the non-perishable hampers lacked in animal protein and fats but the hamper that contain both perishable and non-perishable items were found to be quite healthy when compared to the recommendations by Canada's Food Guide (Willows and Au, 2007). These hampers also provided a cost savings of almost sixty dollars for the students (Willows and Au, 2007). However, students are only able to access these hampers two-times per month therefore limiting their benefit (Willows and Au, 2007).

A similar study published in 2014 at the University of Toronto also suggested that food banks aren't enough to meet student needs (Jessri et al). This study aimed to evaluate the nutritional adequacy of food hampers as well as estimate the cost savings to students by using the campus food bank. The restriction of having only non-perishable items in food hampers results in many nutritional requirements not being met, most notably for the dairy and vegetables and fruit food groups (Jessri et al, 2014). The costs savings for a one-person hamper was estimated at just under fifteen dollars, which the authors concluded would be considerable over time (Jessri et al, 2014). One final recommendation from this research was that dietitians collaborate with food bank staff to help design a healthier hamper, especially with regard to micronutrients, and partnerships with donors be secured to meet the requirements of the hamper menu (Jessri et al, 2014).

Dr. Mary Nugent and her research team at the University of Lethbridge interviewed fifteen students who had accessed their campus food bank (2011). The goal of this study was to obtain qualitative information on the experiences of students accessing food banks (Nugent,

2011). Nugent found that while students valued their health they often lacked the necessary supports to maintain adequate nutritional intake (Nugent, 2011). Nugent's research provides valuable information on the multiple strategies used by students during times of food insecurity. Nugent also described the various economic pathways that lead students to the food bank, exposing health inequities that require further attention (Nugent, 2011).

Based on the results of these campus food bank studies it is evident that student food banks are not sufficient in preventing student food insecurity but rather act as an emergency resource during times of acute food stress (Willows and Au, 2007; Jessri et al. 2014; Nugent, 2011). Current measures intended to assist students experiencing food insecurity are not effective and more research is required to successfully identify what types of support Canadian students need during their postsecondary education.

1.20 Critical Life Transition

The majority of students attending university are between the ages of 18 and 25. This developmental period has been labeled as "emerging adulthood" in some literature sources (Maynard, 2016, Arnett, 2013). The emerging adulthood life stage is characterized by the exploration of identity and developing a sense of self for the future. Although this study did not look specifically at food security status the research did aim to investigate impacts of financial insecurity during this stage of life. The researchers found that post-secondary students within this age frame are particularly vulnerable to experiencing the long-term health and stress outcomes as the result of financial strain (Arnett, 2013).

1.21 Summary

This literature review reveals that there is significant cause for concern with regards to university student food security. Gaps in the research to-date are evident. Many of the studies investigated this phenomenon using quantitative analysis techniques, but sample sizes were small and randomization was only used in a few cases and this therefore raises questions about the quality of the data analyzed (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). Also, while quantitative data can describe aspects of the problem, they do not provide adequate information regarding the lived experience of students coping with food security stress or information regarding how widespread the

problem may be (Nugent, 2011; Maynard, 2016). Examination of student food insecurity should be a priority in university student health initiatives. A lack of economic or physical access to safe, nutritious and acceptable food could be creating nutritional inadequacies, as well as difficulty attending classes, creating barriers to learning and succeeding in postsecondary education. More research is critical to gain understanding of the student experience and to create meaningful interventions in order to prevent social and economic gradients from perpetuating in Canadian society.

CHAPTER 3: METHODS

1.22 Overview of Study Design

This study may be described as a sequential exploratory multi-method design that occurred in two phases: quantitative measures looking at relationships between variables, followed by exploring perceptions of barriers to food security on campus among students and student support providers (Creswell, 2007). More specifically, data gathered in the first phase was used to identify the prevalence and severity of food insecurity among the student body by their demographic and living circumstances characteristics (Jicks, 1979; Creswell, 2007; Creswell et al., 2013). This influenced the second, qualitative phase of the study, in which student support providers were invited to elaborate on and contextualize these measures with personal experience and first-hand insights (Creswell et al, 2003).

The use of different types of data allows for multiple perspectives as well as hypothesis testing in an attempt to better understand predictors of food insecurity among students (Creswell et al, 2003; Hessay-Biber and Leavy 2011). Details regarding the research paradigm, specifics of sampling, recruitment and data collection approaches, and analytic strategy are outlined below.

1.23 Research Approach

This multi-methods study is, at its core, a quantitative study with a qualitative follow-up to improve the quantitative study by providing additional richness to the research questions (Creswell et al, 2003; Morse, 1991).

This research is informed by a post-positivist paradigm (Creswell et al, 2003; Brewer and Hunter, 1989). This involves collecting validated, objective measures and converting data into numerical form so that statistical calculations can be made and conclusions drawn (Creswell, 2007; Creswell et al, 2003; Brewer and Hunter, 1989). Quantitative analysis allows for hypothesis testing, where one or more predictor variables are tested for a relationship, and strength of relationship, with an outcome variable (Creswell et al, 2003; Brazeley, 2009). Due to the cross sectional nature of the survey it is not possible to consider causation between variables, but rather general associations that may be further explored using in-depth qualitative means. The quantitative study results were used to construct preliminary theories that were further refined during the next, qualitative research phase.

The qualitative research approach was inductive, which means that the data collected was used to develop a theory or look for a pattern of meaning (Creswell, 2007; Jick, 1979; Brewer and Hunter, 1989). This involves a move from the specific to the general and is sometimes called a bottom-up approach (Creswell et al, 2003). Reflexivity was exercised during data collection in an effort to achieve a holistic understanding of food insecurity on campus (Jick, 1979; Creswell et al, 2003; Brewer and Hunter, 1989). Data collection happened sequentially with the first phase of data influencing the second, and the second phase was used to interpret results from the first phase (Creswell, 2007).

By triangulating quantitative and qualitative data this research is able to draw on the strengths of quantitative and qualitative research designs, while working to minimize overlapping weaknesses (Jick, 1979; Creswell et al, 2003; Brewer and Hunter, 1989).

1.24 Population and Sample

At the centre of this research are diverse groups of University of Saskatchewan students. The sample of students represents a relatively broad range of ages and backgrounds. A simple random sample was used to ensure that bias is minimized in the results.

Approximately one month prior to administering the survey to the target sample a pilot survey was administered to a sample of thirty students. Following this pilot, the cross-sectional, 35 question survey was administered electronically to a random sample of 4500 University of Saskatchewan students by email and remained open for completion for a three week period of time. A reminder was sent at the beginning of the second week and the day before the survey closed. Posters, announcements and on campus newspapers promoted the upcoming survey the week before it was sent out. All students who took the survey were entered for a chance to win an iPad.

Five interviews were conducted with key informants. Key informants were accessed through partnership building with existing centres on campus, such as *The Women's Centre*, *The Aboriginal Students Centre*, *The International Students and Study Abroad Centre*, as well as with *Student Health Services* among others. The interview participants were key informants who were selected because of their work with students identified as being potentially vulnerable to food insecurity in the first quantitative phase of our research, as well as by previously published

literature on the topic. Interviews were conducted with student support providers, who were invited to elaborate on and contextualize the survey results with insights from their work with students. Interviews with student support providers were conducted rather than interviewing individual students because food insecurity is often well hidden and kept very private by individuals experiencing it (Tarasuk et al, 2012). The student support providers who were purposefully sampled work directly with students, have had the opportunity to build rapport with individuals seeking help and were therefore deemed to be able to provide important insight into the issues faced by students.

1.25 Ethics and consent

Ethical approval was obtained from University of Saskatchewan Behavioural Ethics Review Board prior to administering the survey. A consent form was included in each email that contained a survey; consent was implied by completing the survey. Participants were able to withdraw consent at any time by choosing to exit the survey. An amendment was made to the ethics application to include the qualitative, interview component. Verbal or written consent was obtained from each participant prior to beginning the interview based on interviewee preference. Participants were reminded that they could choose to end the interview at any time. Member-checking was done by providing a sample of the completed manuscript to each of the interview participants to ensure the representation of their perceptions were accurately captured in the analysis.

1.26 Data Collection

Data collection occurred in two phases: through use of a quantitative cross-sectional survey regarding the prevalence and severity of food insecurity, coping strategies and demographic information among University of Saskatchewan students, followed by qualitative data collection to discuss and explore in depth the survey information gathered through interviews with student support service providers (Creswell, 2007; Creswell et al, 2003).

The survey used in the first phase of this research was originally developed by Noreen Willows and her research team at the University of Alberta and then was adapted for use in this study and another similar study at Acadia University by Lesley Frank, Elaine Power and Rachel Engler-Stringer. The survey used as series of HFSSM questions to assess food insecurity among

adults in the last twelve months (USDA, 2014; PROOF, 2016). These ten questions were embedded in the larger survey along with a series of other questions designed to capture additional student demographics, living situations, income sources and food insecurity coping strategies (survey included in appendix 6). Coding used by the USDA and PROOF Canada was used to categorize participants as either food secure or marginally, moderately or severely food insecure.

The results of the survey were used to influence the development of an in-depth, semi-structured interview guide that investigated topics such as student coping strategies, perceived barriers to food security, as well as observed trends in post-secondary education, among others. The questions also asked support providers for their perceptions of the mental and physical implications of food insecurity, as well as any academic consequences they perceived. This method was selected to elaborate on the results from the quantitative survey in an effort to gain critical insights into the experiences of students as described by those providing them with support throughout the university term. The thematic analysis, semi-structured interviews in this study used a set of questions that represent a purposeful and focused approach to data gathering. Prior to administering the interviews, the interview schedule was vetted by members of the research committee. The interview was piloted on one individual with no prior knowledge of or connection to the study. Feedback from the research committee and the pilot interview were used to modify the interview schedule prior to data collection to ensure clarity and lack of leading questions. Interviews were generally between thirty minutes and one hour in length and Interviews were conducted in person, by the first author. A semi-structured interview approach allowed for unexpected topics to be explored as they emerged. The interviews took place on campus, in a private location convenient for the participants. The interviewer used verbal probes to clarify, gather additional details and direct interview respondents back to the main questions being asked. Although the researcher was not a neutral subject in this exchange she acknowledged her own biases and reactions during the interview but worked to frame questions in an open-ended and neutral structure to allow interview participants to draw from their own perceptions and experiences. All interviews were recorded using two recording devices and transcribed verbatim for analysis. Reflexive journaling was used by the researcher before and after conducting interviews to allow the researcher to record her thoughts, recognize any potential bias that may influence coding, as well as document any challenges in the interview

process. Reflexive journaling was done in an attempt to maintain transparency and validity throughout the interview process.

1.27 Data Analysis

Health Canada developed a three-category system to measure food security status in the Canadian population. The survey is based on an eighteen-question measure. More recently in Canada the food security assessment has shifted to a four category measurement outlined by Tarasuk et al (2012) which is based on the original USDA tool (HFSSM). This four category measurement tool includes marginally food insecure individuals who have reported some concern or problem of food access over the past twelve months. This category is not captured using the Health Canada CCHS measurement. The four categories are justified by the acknowledgment that as little as one positive response to the CCHS survey indicates compromised food security, and should be considered and addressed (Tarasuk et al, 2012).

The HFSSM food security questions may be modified from the eighteen questions to a ten item or shorter module, depending on research needs with particular populations (USDA, 2014; PROOF 2016). For the purpose of our study the ten question measurement tool was used, as it is specific for adult household food security assessment. As the HFSSM national survey seeks to capture a representative sample, it does not specifically collect postsecondary student data, therefore this potentially at-risk segment of the population may be concealed.

1.27.1 SPSS Analysis

The quantitative survey data was recorded and analyzed using SPSS 22.0. Quantitative survey data was received from the survey administration centre as an Excel file. This data was cleaned and ordered and transferred into SPSS. Statistical analysis began with simple descriptive information to look for prevalence and distributions using Chi Square techniques. The food security measure was grouped into a dichotomous variable with food security being the outcome or dependent variable (coded as 0) and marginal, moderate and severe food insecure being combined into one food insecure category (coded as 1). A p-value of 0.05 was used to test for significance, meaning that the probability of the results being due to chance are less than 5%. Frequencies of food security status, coping mechanisms and demographic information were calculated using chi-square techniques to determine the distribution of food insecurity.

Frequencies of food security status, coping mechanisms and demographic information were calculated. Contingency tables are used to determine the distribution. Chi-square and likelihood ratio tests were used to test the significance of independence (association) between variables. Pearson correlation test for association was conducted for each variable before being entered into the model to test for collinearity. Collinearity occurs when there is a strong relationship between two variables (0.80 or greater) that may artificially inflate the model due to significant overlap between the categories (Greasley, 2007). If variables were found to have collinearity only one was included in the model. The variable selected to remain in the model was selected based on the literature review or sample size. Backward logistic regression model was used to evaluate an association between food security and potential factors that may be associated with increased association of food insecurity in the last twelve months to determine the odds ratios for each variable. Finally, interaction between variables was tested and significant interactions were included in the final model. Statistical analysis was conducted using IBM SPSS software (version 22, Armonk, NY, 2013).

1.27.2 Coding

This research used a thematic analysis research methodology that guided the second qualitative phase of this research process. Thematic analysis is used to look for patterns and relationships across a data set (Guest, MacQueen and Namey, 2012). NVivo 11 software was used to record, store and analyze the qualitative interview transcripts and other relevant text. To begin the thematic analysis process, the text was read and re-read in an effort to understand context and build concepts from the data. This process allows for the data to be “opened up” to expose the meaning, idea and thoughts in it (Guest et al., 2012). This process is called open coding and was used for the initial analysis concerned with identifying, naming, categorizing and describing phenomena found in the text (Guest et al., 2012; Boyatzis, 1998).

Once familiar with the data, codes can be made where significant pieces of text are highlighted and labeled. In this research project many codes were created initially. After creating the codes, they were analyzed to find the similarities and grouped into categories based on their common properties. This group phase may be referred to as axial coding (Boyatzis, 1998). In a thematic analysis approach emphasis is placed on causal relationships, and fitting things into a basic frame of generic relationships (Boyatzis, 1998). These relationships were used to build

main codes that required further development and refinement by the researcher. Any data that was unclear was marked by the researcher and revisited at various phases of coding to determine if a relationship had emerged. Many codes did not contribute to the understanding of the research objectives and were set aside in a separate category.

An audit trail of the interview process was maintained during the data collection process. The purpose of an audit trail is to provide a detailed account of the research steps taken during the interview process. The audit trail includes notes from reflexive journaling, any modifications made to the interview schedule, what types of debriefing occurring with interview participants, memos documenting the coding process and member-checking feedback. Samples of the research audit trail can be found in appendices 3, 7 and 8.

CHAPTER 4: RESULTS

Results from this multi-method research project are provided in the following two manuscripts in sequential order. The first manuscript describes the quantitative, survey phase of the study which influences the second, qualitative interview phase of the study. The results from the two phases of the study are analyzed together to achieve a holistic understanding of the food insecurity situation at the university campus.

QUANTITATIVE RESEARCH

1.28 Abstract

PURPOSE: Research on post-secondary student food insecurity is currently in its infancy but initial results hint at the existence of alarming prevalence as high as two or three times Canadian national average of 12%. As experiences of food insecurity may seriously impact student mental and physical health, with a concurrent diminution of educational outcomes, it is important to investigate how prevalent food insecurity currently is among students and which students are the most vulnerable, in order to inform programming and policies to reduce the problem.

METHOD(S): The study used an online survey sent to a simple random sample of roughly one quarter of the entire University of Saskatchewan students to collect cross-sectional data regarding the prevalence and severity of food insecurity, coping strategies and demographic information (n = 4500, response rate = 30.2%).

RESULTS: Results of the survey indicate that 39.5% of post-secondary students attending the University of Saskatchewan report some level of food insecurity in the previous twelve months. Of those students 11% reported marginal, 21.1% reported moderate, and 7.5% reported severe food insecurity in the previous twelve months. Descriptive statistics between several student demographic and household characteristics and an increased odds of experiencing food insecurity were observed, including students who are parents (OR = 1.73, CI=1.06 – 2.83), international students (OR = 2.01, CI=1.11 – 3.82), and students who rely on government student loans as their primary income (OR = 1.97, CI=1.39 – 2.81).

DISCUSSION: Compared to the general public students appear to be at a greater risk of experiencing food insecurity, with University of Saskatchewan students reporting food insecurity

levels at more than three times the Canadian national average of 12.0%. Further research to better understand what is creating and sustaining barriers to food security among university students will inform healthy campus and post-secondary education policy in Canada.

1.29 Introduction

Education, in addition to being a predictor of lifetime earnings, social standing, and economic resources, is also an important predictor of healthy behaviors, and life expectancy (Canadian Federation of Students, 2015). Poor educational attainment is a burden consistently borne by certain groups, particularly those from low income households (Canadian Federation of Students, 2015). There is evidence that rising rates of tuition and associated costs of post-secondary education are creating an environment where student debt and student poverty are at an all-time high (Tarasuk and Vozoris, 2003). This could be creating and sustaining multiple barriers to post-secondary education for some students (Canadian Federation of Students, 2015; Tarasuk and Vozoris, 2003). One of the consequences of student poverty is the inability to consistently access adequate and acceptable food for proper nutrition (Tarasuk and Vozoris, 2003; House, Su and Levy-Milne, 2006). "Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary need and food preferences for an active and healthy life" (USDA, 2014; Health Canada, 2014). In contrast, food insecurity occurs when one or more of these conditions are not met. Food insecurity stems from a lack of financial resources and is strongly associated with household income (USDA, 2014; Health Canada, 2014).

Canadians who experience food insecurity are uncertain if they are able to acquire adequate quantity and/or quality of food in a socially acceptable way (USDA, 2014; Health Canada, 2014). Experiences of food insecurity may adversely impact student mental and physical health, as well as educational outcomes (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). Research to date indicates a positive correlation between increased poverty and risk of food insecurity, therefore it may reasonably be inferred that increasing student poverty will result in increasing food insecurity amongst at risk student groups (USDA, 2014; Health Canada, 2014). Research investigating this hypothesis is only just emerging but initial results are troubling (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and

Anderson, 2016). Various researchers have argued that this is a serious problem with students going hungry and are unsure of how to access help (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). There is a need for more detailed research, particularly in Canada, to investigate the best ways to support students.

This study examines the prevalence and severity of food insecurity among students attending the University of Saskatchewan, and explores the interactions between personal and environmental characteristics that may put some students at a greater risk of experiencing this problem. It also examines the strategies that are most commonly used by postsecondary students at the University of Saskatchewan to overcome barriers associated with food insecurity.

1.30 Methods

This study was conducted in collaboration with Student Health Services at the University of Saskatchewan and was part of a larger multi-method study investigating student food security. Data collection involved a cross-sectional survey to examine the prevalence and severity of food insecurity, coping strategies, and demographic information among students.

The survey consisted of approximately thirty questions. The overall survey was adapted from a similar survey created by Dr. Noreen Willow's research team at the University of Alberta, which describes the food security status, food insecurity coping strategies, characteristics, and experiences of student clients of the Campus Food Bank at the University of Alberta in Edmonton, Alberta, Canada (2008) Survey questions include student demographics and living situation to help identify characteristics showing the highest odds of experiencing food insecurity. These questions included information about gender, age, primary source of income, perceived mental and physical stress levels and more. Embedded in the survey were ten questions from the HFSSM USDA income-related adult household food security measurement and contains questions examining various aspects of food insecurity (USDA, 2014; Health Canada, 2014). Based on the number of affirmative responses, households were classified as either food secure or marginally, moderately, or severely food insecure, according to the four categories outlined by Tarasuk et al. in the PROOF Report on Food Insecurity Policy Research in Canada (2014). Food secure households are those who gave no indication of any income-related problem of food access. Those who are marginally food insecure have reported some concern or

problem of food access over the past 12 months. Households classified as moderately food insecure have reported compromises in the quality and/or quantity of food consumed. Those classified as severely food insecure have reported more extensive compromises, including reduced food intake because of a lack of money for food.

The survey was administered in partnership with Student Health Services, using the CampusLab survey tool on the University of Saskatchewan servers. Prior to releasing the survey it was piloted to a sample of thirty students. The survey was a simple random sample design sent to approximately 25% of the University of Saskatchewan students ($n = 4500$) of the full student body ($N = 20,000$). The survey was administered electronically through the University of Saskatchewan email service and remained open for a three-week period. The partnership with Student Health Services allowed our research team to encourage participation in the survey through use of student health communication strategies. For example, posters, announcements and on-campus newspapers promoted the upcoming survey the week before it was sent out. Once the survey was live, a reminder was sent at the beginning of the second week and the day before the survey closed. All students who completed the survey were also entered for a chance to win an iPad. A response rate of 30.2% was achieved ($n = 1359$).

Frequencies of food security status, coping mechanisms and demographic information were calculated. Contingency tables are used to determine the distribution. Chi square tests were used to test the significance of independence (association) between variables, where chi square was not appropriate likelihood ratio tests were used. Pearson correlation test for association was conducted for each variable before being entered into the model to test for collinearity. If variables were found to have collinearity only one was included in the model based on literary relevance or sample size. Backward logistic regression model was used to evaluate an association between food security and potential factors that may be associated with increased association of food insecurity in the last twelve months to determine the odds ratios for each variable. Finally, interaction between variables was tested and significant interactions were included in the final model. Statistical analysis was conducted using IBM SPSS software (version 22, Armonk, NY, 2013).

Ethical approval was obtained from the University of Saskatchewan Behavioural Ethics Review Board and participant consent was implied by completing the survey.

1.31 Results

Based on the students who completed the survey 39.5% reported experiencing some food insecurity in the previous twelve months. Of those students who experienced food insecurity 11% experienced marginal food insecurity, 21.1% experienced moderate food insecurity and 7.5% reported experiencing severe food insecurity.

Certain student demographic characteristics were associated with an increased risk of experiencing food insecurity. Statistically significant descriptive comparisons are included below in Table 2:

Table 2. Socio-demographic characteristics of the study sample by food security status

<i>Characteristic</i>	<i>n</i>	<i>Food Secure (%)</i>	<i>Food Insecure (%)</i>	<i>P-value</i>
Gender:				0.085
Female	847	59	41	
Male	432	64	36	
Other	3	33	67	
Total	1282			
International Students:				<0.001
Yes	137	42	58	
Canadian Students	1145	63	37	
Total	1282			
Parents				0.003
Yes (At Least One Child)	106	47	53	
Not Parent	1176	62	38	
Total	1282			
Newcomers To Canada				<0.001
Newcomers	133	41	59	
Canadians 5+ Years	1098	64	36	
Total	1282			
First Nations Students				<0.001
First Nations (Status and Non-Status)	58	36	64	
Non First Nations Students	1224	62	38	
Total	1282			
Living Arrangement				<0.001
Living with Support	553	67	33	
Living without Support	726	55	45	
Total	1281			
Program level				0.717
Undergraduate	1073	61	39	
Graduate or Higher	209	60	41	
Total	1282			
Primary Source of Income				<0.001
Government Student Loan	251	45	55	
Scholarship/Bursary	126	61	39	
Bank Loan	60	52	48	
Research/Teaching	41	61	39	
Assistantship				
Savings	202	71	29	
Family	259	69	31	
Employment	295	62	38	
Total	1234			

*Gender uses Likelihood ratio, not Chi Square, because 33% (other) of the cells have average mean less than

**Food Insecure includes marginal, moderate and severe experiences of food insecurity, measured using the PROOF criteria

***First Nations students includes Status and Non-status, data was not significant when data from Métis Student was included

****Supported living refers to living with parents or in residence with a campus meal plan; Unsupported living refers to living alone, with roommates or in residence without meal plan

The food security measurement was converted into a dichotomous variable where any levels of food insecurity (including marginal, moderate and severe) are recorded as “food insecure” and was compared to the variable “food secure”. The results from the table above show descriptive information regarding the socio-demographic breakdown of the students who participated in the survey, and the prevalence of those who were characterised as experiencing food insecurity in the last twelve months. These students include those who are international students, of whom 58% had experienced food insecurity in the last twelve months respectively. Other students who experienced higher rates of food insecurity also includes students who are parents (53%) as well as 64% of status First Nation students and non-status First Nation Students (there was no significant difference between Métis students and the greater student body and none of the survey respondents identified as Inuit). Students who are newcomers to Canada also had a high prevalence of reporting experiencing food insecurity (59%) compared to Canadian student who had been here for more than five years.

When investigating primary source of income the results of the survey indicated that 55% student who relied on government student loans as their primary source of income experienced food insecurity in past twelve months compared those students whose primary source of income was family (31%) or savings (29%). Pearson correlation coefficient was calculated to assess for collinearity. It was found that the variables for gender and for being a parents were highly correlated (correlation coefficient: 0.98), suggesting perhaps that most parents are campus are also females. Therefore gender was removed from the final model because the Chi Square analysis indicated that this variable was not significant

Some socio-demographic characteristics were associated with significantly higher odds of having experienced food insecurity in the past twelve months. These odds ratios results are shown below in Table 3:

Table 3. Odds of individuals experiencing food insecurity in the past twelve months for selected characteristics

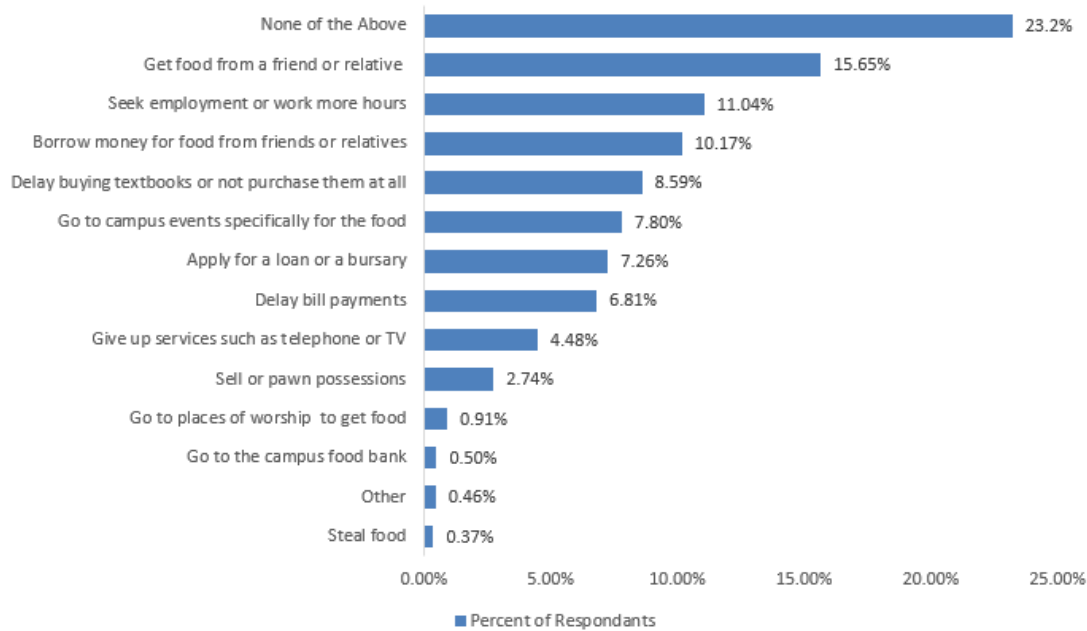
<i>Characteristic</i>	<i>Odd Ratio (adjusted)</i>	<i>95% CI</i>	<i>P-Value</i>
<i>International Student</i>	2.01	1.110 – 3.816	0.022
<i>Newcomer To Canada (< 5 Years)</i>	0.488	0.267 – 0.890	0.019
<i>First Nations Student¹</i>	0.235	0.045 – 1.229	0.086
<i>Graduate Student</i>	1.210	0.793 – 1.848	0.376
<i>Student Who Is A Parent Primary Source of Income</i>	1.734	1.064 – 2.828	0.064
<i>Government Student Loans</i>	1.974	1.386 – 2.811	<0.001
<i>Scholarship/Bursary</i>	0.674	0.401 - 0.119	0.127
<i>Bank Loan</i>	1.554	0.879 – 2.746	0.129
<i>Teaching/Assistantship</i>	0.770	0.353 – 1.681	0.512
<i>Savings</i>	0.673	0.453 – 1.001	0.051
<i>Family</i>	0.589	0.404 – 0.859	0.006

¹*Includes Status First Nations and Non Status First Nations
Statistical approach used was backward linear regression model using variables: International students, Newcomer to Canada, First Nations Students, Graduate Student, Student who is a Parent, and Primary Source of Income.*

Table 3 outlines the increased risk that certain demographic groups have in terms of likelihood of experiencing food insecurity. Given that food secure was coded as 0 and food insecure was coded as 1, an odds ratio greater than 1 indicates an increased association with the outcome of food insecurity. For example, international students had the greatest risk, with students being two times more likely to experience food insecurity compared with non-international students (OR = 2.01; CI = 1.11 – 3.82). Students who are parents also expressed greater odds of having experienced food insecurity in the last twelve months 1.73 times (CI = 1.06 – 2.83) more likely compared to students who are not parents. These particular sub-populations were taken into consideration when selecting stakeholders and developing the interview schedule to probe deeper into the potential factors underpinning barriers to food security in these populations.

The third research question this project aimed to address was a better understanding of what current coping strategies students are using during times of food insecurity. A question relating to this included in the survey and several possible selections options were provided. Students were not limited in the number of selections and many students chose multiple coping options. These frequencies are reported in Figure 2:

Figure 2. Coping strategies students used during periods of low food security.



(n = 1274, responses = 2839)

**Students could select more than one option*

These results indicated that students used a wide variety of methods to cope with periods of food shortage. The most commonly used methods include getting food from friends or relatives, including going to someone’s house for a meal. Other common strategies related to financial management, include getting a job or increasing work hours, borrowing money to be used for food and/or delaying the purchase of textbooks or not buying them at all.

To address the final research question for this project, regarding what impacts food insecurity has had on the student university experience, students were asked to report on how they believed not having enough money for food has impacted their health and academic outcomes (Table 4). Students who experienced food insecurity in the last twelve months, self-reported that their mental and physical health had suffered as a result of food insecurity, as well as their social life and academic standing. This was also elaborated on with student support providers in the second phase of the study to allow for more in-depth perceptions to the possible impacts of food insecurity of university students experiences.

Table 4. Student University and Life Experiences Due to a Lack of Money for Food

<i>Self-reported characteristic</i>	<i>N</i>	<i>Food secure n (%)</i>	<i>Food insecure n (%)</i>
My Physical Health Has Suffered	227	57 (25)	170 (75)
My Mental Health Has Suffered	232	54 (23)	178 (77)
My Social Life Has Suffered	230	72 (31)	158 (69)
My Grades Have Suffered	164	35 (21)	129 (79)
I Had To Drop A Course	28	8 (29)	20 (71)
None Of The Above	776	616 (79)	160 (21)

1.32 Discussion

The overall prevalence of students at the University of Saskatchewan who had experienced food insecurity in the last twelve months was 39.5%, more than three times the national average of 12.0% (Tarasuk, 2015). These statistics are alarming and are bringing post-secondary student food insecurity under the scrutiny of researchers. The results from similar studies conducted on other university campuses indicate that food insecurity is a serious problem among post-secondary students (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). There have been few studies to date examining prevalence and risk factors for food insecurity among students, with very few conducted in a Canadian context (Booth and Anderson, 2016; Nugent, 2011; Medlrum and Willows, 2006; Jessri et al, 2014).

While comparison between studies is difficult due to variations in methodology, findings from previous studies found similarly high prevalence's of food insecurity; Chaparro et al from the University of Hawaii at Manoa found that 21% of students were food insecure (2009). In Australia, Hughes et al. reported a food insecurity rate of 46.5% at the University of Australia (Hughes et al, 2011). Earlier this year, data collected from 1,882 undergraduate students across four public Illinois Universities determined a food insecurity rate of 35% Mooris et al, 2016).

The definition of food insecurity encompasses a broad spectrum of factors, including economic access to food as well as physical availability and food preferences. There are often preconceived ideas in western societies about post-secondary student spending habits, however, to assign student food insecurity to student lack of financial management and planning alone may be an oversimplification of the problem. The factors contributing to food insecurity are

complex and therefore it is difficult to assess (Tarasuk and Vozoris, 2003; Tarasuk et al 2012; Loppie and Wien, 2009). This research explores correlated factors of student demographic characteristics with food insecurity, providing information that will provide a basis for further investigation and understanding. The results of the survey suggest that food insecurity is disproportionately affecting some students more than others and may be an issue of health equity (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016).

Educational attainment is one of the most important contributors for upward social mobility (Canadian Health Measures Survey, 2010). It is also an important marker in the transition to adulthood, and a reflection of cumulative socioeconomic advantages and disadvantages (Canadian Health Measures Survey, 2010). Food insecurity among college students may have an impact on future trajectories into adulthood (PHAC, 2015; Canadian Health Measures Survey, 2010). Students who are able access a reliable network of support may be buffered during short-term episodes of food insecurity more than students who are removed from their support networks (PHAC, 2015; Canadian Health Measures Survey, 2010). This is seen in the results found by Hughes et al. at the University of Australia, where students who rented, boarded or shared accommodations were more likely to have experienced food insecurity (2011). This was not reflected in the regression model from the University of Saskatchewan data however this same underlying principle may relate to international students and newcomers to Canada, who were shown to experience higher rates of food insecurity compared to their peers.

Previous research indicates a strong association between race/ethnicity and food security status (Chaparro et al, 2009). Chaparro *et al.* reported ethnicity as the strongest predictor of food insecurity among students in Hawaii (2009). The data from the University of Saskatchewan showed that student who identified as First Nation (including status and non-status) were significantly associated with food security in the initial stages of distribution analysis, but was not significant in the final multivariate analysis (71% lower experiences of food insecurity in first nations students in the last twelve months). Identifying as being Métis was not shown to be a risk factor of food insecurity when considered alone or in the multivariate model. Given the previous literature on the vulnerability of this population in other studies and the broader Canadian context, the researcher chose to include this variable in the overall model. Further

research that involves over-sampling of this specific sub-population may be beneficial to increase statistical validity and gain a better understanding of the possible relationship between food insecurity and first nation students

Contrary to the literature, newcomers to Canada were shown to have protective, or lower odds of experiencing food insecurity compared to the other demographic characteristics (51% lower food insecurity status for students who are newcomers to Canada). These results are very interesting, especially when comparing with the fact that international students have the highest rates of food insecurity and newcomers to Canada have comparatively low, or protective, characteristics. While this is not the focus of this study it is worth further investigation to determine what factors are contributing to these differences, such as elevated tuition rates for international students, possible language or cultural barriers or perhaps local support network.

It is difficult to say from our research how much stress is experienced by food insecure students, but results indicate additional worries over-and-above those typical of daily student life. Food insecurity was correlated with self-reported reduced physical and mental health, and is believed to be contributing to reduced social participation, as well as an individual's ability to find academic success. The potentially detrimental effects of food insecurity on student wellbeing and educational outcomes is adequate cause for alarm and response and the current supports in place for students are not meeting their needs. Despite having a food bank on campus few University of Saskatchewan students are accessing these emergency food services, with less than 1% of the participants in our survey indicating that they had accessed the on-campus food bank in the previous twelve months; a similar number to those students who resorted to stealing food.

Studies suggest that university students appear to be at risk of food insecurity, both as a product of their socioeconomic and demographic attributes. These factors may be jeopardizing certain students' health and chance for academic success. It is important to investigate the systemic factors contributing to food insecurity in order to work towards proactive policy reform that will more effectively meet the needs of students, and allow for a more equitable learning community.

1.33 Study Limitations

While the simple random sample design adds strength to the generalizability of this survey to the greater student body, it is important to acknowledge its limitations; Food insecurity is a complex issue that is difficult to capture through the use of cross-sectional, self-reported survey measures. The survey information is limited to a snapshot of information on association, not causality. This type of research design is not reliable for hypothesis testing, rather is suited for hypothesis generating.

Other possible limitations of this research include how well the survey data represents the overall University of Saskatchewan student body. Although the survey response rate was high in comparison to previous research in this area and high for an online survey design, which typically has response rates around 11% (Creswell and Plano Clark, 2011). The self-selected nature of the survey may have contributed to bias in the research results because those who are most affected by food insecurity may be more motivated to take the survey.

1.34 Conclusion

Students appear to be at a greater risk of experiencing food insecurity compared to the overall Canadian population, with some student sub-groups at particularly high risk of experiencing food insecurity (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). Further research should be conducted on other Canadian university and college populations to determine if this problem exists in other contexts. Additional qualitative research involving at-risk students and key informants in student support services is also needed to better examine the root causes and explore possible solutions. Meaningful engagement with and dissemination of the research results may help inform policies that will support health equity and create equal opportunities for success in all student populations during this critical stage of life. This study may also be used as a model for other educational institutions wanting to engage in similar research on their own campuses.

QUALITATIVE RESEARCH

1.35 Abstract

PURPOSE: Research suggests that food insecurity may be a more significant problem among post-secondary students compared to the general population. Food insecurity has the potential to impact mental and physical health as well as educational outcomes. It is important to investigate the experience of food insecurity among post secondary students to better understand barriers to food security and to inform programming and policy that fosters equity in student health and learning.

METHOD(S): This study used semi-structured interviews with employees at the University of Saskatchewan who work in a student support capacity. Stakeholders were identified and accessed through partnership building with Student Health Services. Interviews were typically between thirty minutes and one hour in length. Thematic analysis was conducted.

RESULTS: Interviews with student support providers revealed several themes related to student food security on campus including: (1) factors that may influence food insecurity at the University of Saskatchewan (2) potential implications of food insecurity on student learning and health outcomes (3) possible coping mechanisms used by students during times of low food security and (4) suggested strategies that may help reduce food insecurity at the University of Saskatchewan.

DISCUSSION: This research, one of the first studies of its kind in Canada, is consistent with what is being found elsewhere. There is a need for more research to better understand the barriers to food security among postsecondary students. This research can be used to inform policy change that may support equal opportunity for learning and success among post-secondary students.

1.36 Introduction

There is evidence that rising rates of tuition and associated costs of post-secondary education are contributing to an environment where student debt and student poverty are at an all-time high (Canadian Federation of Students, 2015). Student poverty may be creating and sustaining multiple barriers to post-secondary educational attainment (Canadian Federation of Students, 2015; Tarasuk and Vozoris, 2003). One of the potential consequences of student

poverty is the inability to consistently access adequate and acceptable food for proper nutrition (Canadian Federation of Students, 2015; Tarasuk and Vozoris, 2003). Food security is understood as existing “when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.” (USDA, 2014; Health Canada, 2015). In contrast, food insecurity occurs when one or more of these conditions are not met. Food insecurity stems from a lack of financial resources and is strongly associated with household income (USDA, 2014; Health Canada, 2015). Food insecurity has been argued to be an outcome of student poverty (Hughes et al, 2011; Booth and Anderson, 2016; Morris et al, 2016, Nugent 2011). Food insecurity has the potential to impact both the health and learning of students and should be considered a health priority in post secondary institutions (Hughes et al, 2011).

There is a need to understand ‘how’ and ‘why’ students become food insecure in order to address the problem. According to the literature, the scope and experience of postsecondary student food insecurity is not well understood. Currently there are a limited number of studies on the topic and almost none of this research has taken a qualitative approach (Nugent, 2011). This research is important not only in light of limited research but also because the situation at hand may be perpetuating social and economic disparities in Canada. Ultimately, university and broader policy should address potential health inequities affecting some post-secondary students to ensure equal opportunity for all.

1.37 Methods

This study was conducted in collaboration with Student Health Services at the University of Saskatchewan. This research is part of a larger cross-sectional study with the purpose of measuring and understanding food insecurity among students at the University of Saskatchewan. This project used an explanatory approach; primarily using quantitative data augmented by thematic analysis, qualitative semi-structured interviews (Creswell et al, 2013). The results of the quantitative phase of the research are reported on elsewhere.

This paper focuses only on the qualitative phase of the research that examined the challenges of food insecurity as described by student support providers at the University of Saskatchewan. The qualitative research approach used was inductive which means that the data collected was used to develop a theory or look for a pattern of meaning (Creswell et al, 2013;

Morse, 1991). The interview participants were key informants who were selected because of their work with students who were identified as being potentially vulnerable to food insecurity in the first quantitative phase of our research, as well as by previously published literature on the topic. Interviews were conducted with student support providers, who were invited to elaborate on and contextualize our survey results with insights from their work with students. Interviews with student support providers were conducted rather than interviewing individual students because food insecurity is often well hidden and kept very private by individuals experiencing it (Creswell et al, 2013; Morse, 1991). Student support providers, who work directly with the students, have had the opportunity to build rapport with individuals seeking help and may be able to provide important insight into the issues faced by students.

Interviews were generally between thirty minutes and one hour in length and investigated topics such as student coping strategies, perceived barriers to food security, as well as trends in post-secondary education, among others. The questions also asked support providers for their perceptions of the mental and physical implications of food insecurity, as well as any academic consequences they perceived. The development of the interview questions was informed by the results of the first phase of the project. Interviews were conducted in person, by the first author. A semi-structured interview approach allowed for unexpected topics to be explored as they emerged. The interviews took place on campus, in a location convenient for the participants. All interviews were recorded using two recording devices and transcribed verbatim prior for analysis.

NVivo 11 software was used to support the analysis of the qualitative interview data. Transcripts from the interviews were coded for themes that included significant statements, sentences, or quotes that provide an understanding of how informants have supported students at the University of Saskatchewan.

Ethical approval was obtained from the University of Saskatchewan Behavioral Ethics Review Board. Consent was obtained from each participant prior to beginning the interview.

1.38 Results

The interviews conducted were the second phase of a larger, multi-method study. The first phase of the study was an online survey, circulated to approximately one quarter of the

University of Saskatchewan student body. The survey questions investigated the prevalence of food insecurity of campus and inquired about various demographic factors to look for correlations. The results showed that some students were more at risk than others, including students who are international students, students who are parents, and students whose primary source of income is government student loans. The results of interviews with student support providers augmented and verified the results seen in the first phase of this study. The perceptions and observations expressed during the interview process are the opinions of the student support providers themselves and do not represent the official opinion of the University of Saskatchewan. The interview process allowed for elaboration and exploration on the context and potential barriers that some students may be facing.

Analysis of the five interviews conducted with employees working in a student support capacity revealed four main themes: (1) factors that may influence food insecurity at the University of Saskatchewan (2) potential implications of food insecurity on student learning and health outcomes (3) possible coping mechanisms used by students during times of low food security and (4) suggested strategies that may help improve food security at the University of Saskatchewan.

1.38.1 Factors influencing food insecurity:

Student support providers identified several factors that they perceived or observed as barriers to food security for students:

1.38.1.1 HIGH COST OF LIVING

In Saskatoon the average price of rent has nearly doubled in the past decade (Kruchak, 2014). In addition to the high cost of rent the average cost of food has also increased by between 4 and 5% with the largest increases for fresh foods. These increased costs mean that many students are left short. Participant 1 said:

For example, my roommate; sometimes she can't pay me back for bills and things, she is just on student loans and working a minimum wage job a couple times a week and she has a hard time paying for bills and for food.

Participant 3 also mentioned the cumulative costs impacting students:

When you look at the cost of going to the school all of the focus is on education costs, but the bulk of student costs is actually on living costs, And the price of food is going through the roof, it's crazy.

1.38.1.2 HIGH COST OF EDUCATION

Over the past 15 years, the cost of tuition at Canadian universities has steadily increased outpacing inflation, while government funding has declined (Canadian Federation of Students, 2015). More students are struggling to meet the costs of education and student debt is higher than ever in the past (Canadian Federation of Students, 2015). Education-associated expenses have also increased, most notably, textbooks. These costs may be a contributing factor to student food insecurity as they are possibly outcompeting for student food dollars, as a student support provider (participant 1) noted during the interview:

If we continue going down the path we are going now it is going to continue to get worse, education will get more and more expensive, how much is tuition rising this year, 6%? If that is a yearly thing, that's pretty wild... I know we romanticize the past but my dad used to be able to work over the summer and cover his tuition and living costs for the year.

Participant 3 also commented on the high costs of education-related expenses "students will say they're not buying textbooks, it seems like the costs keep rising... you know, textbooks versus food."

1.38.1.3 PHYSICAL ISOLATION FROM FOOD OUTLETS

Other potential influencing factors that were mentioned include the physical isolation of the university campus from food retail outlets. The University of Saskatchewan does not have any grocery store outlets located on the campus or in the surrounding area, with the nearest grocery store being approximately two kilometers away (Kruchak, 2014). Participant 3 commented on the difficulties students may face accessing affordable food options from campus:

We don't have a grocery store on campus or even one nearby, there are some off 8th Street but then you have to figure out transportation and how to get there and back with groceries. "I don't know if we are officially a food desert on campus, I mean you can get apples at Macs for an inflated price, what if you can't afford it?"

Several student-support providers mentioned that student concern increased during a recent public transit lockout by the city of Saskatoon, which made it difficult for students without vehicles to access grocery stores in the city. Participant 2 specifically commented on the struggles students faced during the public transit lock out that occurred in Saskatoon in the fall of 2014: “The biggest increase that I saw was during the bus strike*, that was when our services [at the campus food bank] were used the most because students had a lack of access to more than usual.” Participant 4 also mentioned how Saskatoon is not well suit for public transit in general, which can create challenges in access “We’re a car culture, so if you don’t have a car you’re going to spend a lot of time walking or on a bus to get your food.”

*Interviewee 2 referred to a Saskatoon Transit bus strike but it was a lockout.

1.38.1.4 LACK OF FOOD RESOURCES ON CAMPUS

Other factors suggested to impede food security included a lack of food preference types available on campus, as well as preferences around food access, particularly among international students, as mentioned by participant 3:

We tend to eat earlier in the day whereas some places typically eat around 10 o’clock, there aren’t any food outlets open on campus at that time, so I think the students whose cultures are further away from the way and type of food we eat have a harder time.

1.38.1.5 DEMANDING SCHEDULE

A demanding schedule that does not allow time for grocery shopping and food preparation surfaced as a potential barrier to food security. Many students are balancing multiple roles and responsibilities as students, employees, family members and more. The demands of these roles may take priority over food purchasing and preparation, as mentioned by participant 3: “Their schedules are so crammed and they don’t have enough time to fit everything in, you know what it’s like for a student; I finish class at 8:50 and then I am going to work”

1.38.1.6 ISOLATION FROM SOCIAL SUPPORTS

Student support providers suggested an additional layer of complexity related to individual students’ social support networks, proposing that the students who are most distantly separated from their network of support may be at an increased risk of experiencing food insecurity. Participant 4 spoke to this during the interview:

It is important to know how much family support do they get, where is their family located? Young people away from home for the first time are generally of course exploring life, experiencing different types of activities, be that risky or not risky, and you know, taking care of themselves for the first time ... how we go about talking with students about financial literacy and go about making perhaps more well-informed decisions about their financial health relates to their student experience, academic success and of course their physical wellbeing.

1.38.1.7 INTERSECTING LEVELS OF OPPRESSION

Described by two interviewees as “intersecting levels of oppression”, multiple overlapping hurdles were thought to contribute to student food insecurity as well the overall experience for a post-secondary student. These may include, for example, being a graduate student, an international student and a parent. The university was described by student support providers as a privileged space where low-income students may not feel welcomed. Participant 1 said:

You can see it on campus, you know, Starbucks is right in the centre of our library, and even A&W, those places aren't cheap, school is not cheap, there is a certain level of status with coming to school.” “I think the university has always been set up for a privileged group of people, so those entering the system who are not privileged are going to face stratified issues here, it's going to compound, especially in a space that is just made for a certain type of person.

1.38.2 Implications on student learning and health outcomes

Potential implications of student food insecurity were discussed with student support providers. Support providers mentioned that they observed food insecurity impacting student mental and physical health, as well as potentially impacting learning outcomes and life trajectory. Interviewees believed that food insecurity may result in increased stress levels, increased feelings of depression and of guilt, particularly among students who are care providers or parents, commented on by participant 5:

When you are going to university... you know the basics of nutrition, and you know it's not good for you, and you are willing to take that risk on as a student but not necessarily

for your kid, you are trying to feed several mouths on very little money... and the guilt you get: Am I doing enough? Am I feeding them well enough?

The key informants also discussed the impacts on students' physical health as a result of selecting poorer quality, more affordable food during times of financial hardship. Participant 3 stated that

Students may tend to spend what little money have on what is cheap and accessible, energy dense, not nutritionally dense, fast food snack on campus just to keep them with enough energy to keep going and fuel but not necessarily but eventually it will wear on them to eat like that.

1.38.2.1 DIMINISHED LEARNING OUTCOMES

Several student support providers, including participants 4 and 3 (below), also explained that food insecurity has potentially negative effects on student learning outcomes: "...once people are fed, they are able to learn, they're able to participate, they are able to do so many more things than if they show up hungry..." "...not being able to focus, pay attention in class, even a willingness to go to class, if they don't know if they are going to get food that day."

An important consideration that emerged during the interview process was the potential impact of food insecurity and post-secondary student experience on a student's life trajectory. Participant 4 summarized this by stating:

It has a huge impact on their personal lives, their life trajectory has been changed forever, and everybody goes 'at least you went' but there is some research that suggests that students who go to university and never finish actually do worse than their peers who never stepped foot in the halls of the university

1.38.2.2 STUDENT COPING MECHANISMS

The University of Saskatchewan has a campus food bank, however, the support providers interviewed suggested that the campus food bank was more of an indication that there is a problem, than actually providing a solution. They expressed that many students would likely be unwilling to access the food bank, perhaps due to the stigma of accepting charity: "People aren't willing to do that, to wave their arms and say I need help, you know? People here on campus don't want to bring attention to themselves further" (Participant 5)

Participant 3 also spoke to this in the following statement:

...it's charity. So it can be extremely difficult for some students to be the one receiving the charity... [Students say] I'm not going to the food bank because they are from a place where they would never receive that... it's a welfare model, and there is just too much of a sense of failure I think.

Instead, the support providers hypothesized that students are using a complex system of coping strategies that may include cost saving measures, and various methods of food access.

Support providers explained that students choose low quality, energy-dense foods during time of food shortages in an attempt to stretch their budgets. While the stakeholders referenced a student diet of Kraft Dinner and instant noodles, they stated that the current issues of food insecurity are more alarming and having negative impacts on student health and body weight. One of the stakeholders mentioned the reliance of hungry students on substances, such as stimulants in caffeine, instead of nutritious foods. Participant 1 said "Some students are going hungry, and they are coping in many ways, like coffee or through alcohol and drug use."

1.38.3 Suggested strategies to address student food insecurity

Student support providers argued that the solutions to post-secondary student food insecurity are not easy or straightforward. They believed that one of the first steps required is for the university administration to consider student food insecurity as a major health priority and health equity issue and look to address it through effective policy reform. The importance of more research was highlighted by participant 4:

"If we don't track [food insecurity] nobody cares. We need the data, we need the tracking, we need to better understand this as an issue of equity... This is an indicator of how our institution compares to, perhaps other institutions. Food security is an indicator of social and economic inequity, so how do we go about creating cultural change?"

Some intermediate solutions that were suggested by key informants until food insecurity can be systemically approached included: a subsidized grocery store on campus, more support around financial literacy for students, a marketing strategy for the campus food bank that may reduce the stigma, meal workshops where the participants can take home what they learn to cook

variable expenses, such as textbooks and food therefore creating a situation of potentially fluctuating food insecurity.

Western cultural has a tendency to normalize or minimize the severity of food insecurity through the perception of the temporary “starving student” that is almost considered a rite of passage. However, research suggests that post-secondary food insecurity is a serious public health concern that may have serious and lasting impacts on student health and learning outcomes. Tarasuk describes how "individuals in households characterized by food insufficiency had significantly higher odds of reporting poor/fair health, of having poor functional health, restricted activity, multiple chronic conditions, of suffering from major depression and distress, and of having poor social support" (2012). Previous research has shown that when individuals feel as though their money won't last they will sacrifice food quality for cost savings, contributing to the risk of obesity (Tarasuk and Vozoris, 2003). These data suggest that the financial stress of university may be contributing to an increased risk of chronic illness in students experiencing food insecurity and these concerns were echoed in the interviews conducted with student support stakeholders (Tarasuk and Vozoris, 2003).

Education is an important indicator of social and economic outcomes. Research suggests that food insecurity has the potential to negatively impact student learning (Hughes et al, 2011). Many of the interviewees expressed concerns about student attention and attendance due to food shortages that could be impeding their chances for academic success through a variety of pathways including lack of attendance, ability to focus or adequate time to devote to studies.

It also appears that some students attending the University of Saskatchewan are disproportionately affected by food insecurity creating barriers and unequal opportunity for success. Students believed to be most vulnerable to food insecurity include those who are facing overlapping or compounding social and economic hurdles, such as student parents who may need to support dependents or international students, who have significantly higher tuition rates. Student support providers described how complex some students' lives and multiple roles may be. Many students attempt to maintain a family life, a working life, healthy habits and a social life while navigating their student role. Some students must balance multiple tasks such as traveling to classes, part-time work, and grocery shopping with studying, spending time with family, cooking, and eating. For some students these roles may be more difficult to balance than

for others. Other influencing factors contributing to food insecurity may include cultural differences of insulation from social networks or native culture, such as international students or indigenous students, possibly coming from reserves. These students may have more difficulty navigating the new environment and may not be receiving the support they need compared with students who are from Saskatoon or similar communities. It is recommended that further research be conducted on these population sub-groups to improve understanding and adequately provide additional resources for these students to support them through this critical life transition.

This increased vulnerability may be the result of various factors including family members not being aware of the challenges facing the student or the lack of opportunity for the student to share a meal at a friend's or family's home. Finding a local support network can be an effective way for the student to help navigate a new food environment.

University-associated costs are also thought to be potential contributors to student food insecurity. Textbooks are a considerable student expense, of between \$800 - \$1000 annually for the materials (Canadian Federation of Students, 2015). Support providers argued that when a student had limited financial resources, the purchasing of textbooks was delayed or cut out altogether to help off-set other, essential expenses. Statistics Canada reports that one in two students works during the school year to fund their education, this is up from one in four students in the late 1970s (Marshall, 2010). The average number of hours worked is sixteen hours per week (Marshall, 2010).

An increasing number of campus food banks are being established on Canadian post-secondary campuses in an attempt to meet the food needs of students. However, several recent studies suggest that campus food banks aren't effectively meeting the needs of food insecure students. Studies at the University of Alberta (2007) and the University of Toronto (2014) investigated the effectiveness of emergency food hampers in meeting the needs of student who may be experiencing food insecurity. Both studies found that the hampers were not effective due to a lack of nutritional diversity or an inability for students to access the food hampers on a regular basis (Meldrum and Willows, 2006; Jessri et al, 2014).

Nugent et al. at the University of Lethbridge interviewed fifteen students who had accessed their campus food bank in order to obtain qualitative information regarding the

experience of students (2011). Nugent found that while students valued their health, they often lacked the necessary supports to maintain adequate nutritional intake (2011). Nugent's research provides valuable information on the multiple strategies used by students during times of food insecurity including accessing networks of support, meal/grocery planning, using coupons, learning cooking skills and others (2011). However, when these complex coping mechanisms were inadequate, the students would access the food bank as an emergency resource (Nugent, 2011).

Based on the results of these campus food bank studies, as well as the comments made by student support providers at the University of Saskatchewan, it is evident that student food banks are not sufficient in preventing student food insecurity but rather act as an emergency resource during times of acute food stress (Nugent, 2011; Meldrum and Willows, 2006; Jessri et al, 2014). Therefore, it is necessary to develop a different approach to effectively meeting the needs of students who are experiencing food insecurity.

The interview process allowed for those working directly with students to voice their opinions about the hurdles some students are facing and the potential implications for their health and learning outcomes. Interviews also provided a platform for the discussion of potential supports that can help to encourage student success. While stakeholders agreed that there is no simple solution they argued for a more holistic approach to the systemic issues of food insecurity, through policy reform on campus and beyond.

1.40 Limitations

Potential study limitations include conducting the interviews with student support employees rather than with the students themselves. There are possible validity issues as a result of documenting the perceptions of student experiences rather than firsthand accounts.

Graduate students were identified in phase one of the study as being a student group that was particularly vulnerable to food insecurity. However, we were not able to access a graduate student support worker for an interview, possibly resulting in gaps in the analysis.

1.41 Conclusion

Food security is important to student success and mental and physical wellbeing. Currently there are several barriers impeding student food security and some students are

suffering more than others. Educational attainment is an important predictor of social and economic outcomes; therefore, it is important that students be adequately supported during this critical life period.

It is recommended that further research be conducted to better understand the systemic pathways to student poverty and food insecurity. Student food insecurity should be considered a health priority and this should be reflected through effective policy reform that encourages an equitable education system that provides equal opportunity for success among an increasingly diverse student body.

CHAPTER 5: ADDITIONAL DISCUSSION AND CONCLUSION

1.42 Complementing Research Methods

As previously stated this research design used a sequential study design to incorporate multiple, complementing types of data; meaning that the quantitative data and subsequent analysis provide a general understanding of the research problem while the qualitative data and analysis provided depth and explanation to accompany the statistical results (Creswell, 2003). The use of multiple methods also allowed for answers to research question from a number of perspectives, which helped minimize researcher bias or existing assumptions from the researcher. The use of survey data allowed for broad information to be collected and analyzed, casting a much wider net than would be possible with qualitative data alone. However, statistics and survey results do not provide the human motivation behind certain preferences and behaviors, and the inclusion of interview data allows for increased richness, or depth, to the data obtained in the first phase of the study. This qualitative phase of the study also allowed for additional insights into the topic to be captured as it removes the restrictive barriers of the measurement tool. Transforming these survey results into probing questions that were asked during open-ended interviews with those who work directly with students allowed for more in-depth information on the daily-lived experiences that student support providers observe. Inclusion of qualitative data allowed for the research bias to minimize. The interview process allowed for those working directly with students to voice their opinions regarding potential hurdles some students are facing and possible implications for student health and learning outcomes. For example, the survey tool measured income based adult household food insecurity but while income is the primary predictor of food insecurity, there are other factors that may contribute to food insecurity in this population such as cultural differences, physical isolation of the campus from food retail outlets, time constraints and isolation from social supports that are missed by using the survey design alone.

Use of these two methods together strengthened both phases of the study (Cresswell, 2007). The survey tool is fairly restrictive in an attempt to increase reliability and validity but therefore may miss some of the complex or hidden factors that are contributing to food insecurity. To use an example from this study, the survey results indicated that international

student had the highest risk for experiencing food insecurity with an odds ratio of 2.5. This theme of international students experiencing elevated rates of food insecurity also emerged repeatedly during the interview process with comments suggesting that the cultural differences and social isolation of international students may be contributing to food insecurity in addition to income-related factors. By including both types of data sources we can begin to reveal some potential underlying, systemic factors contributing to international student experiencing elevated rates of food security that can influence further research in this specific group of students. This can be extrapolated for other student demographic subsets that were seen to be at an increased risk of experiencing food insecurity, such as students who are parents or students living in unsupported conditions.

1.43 The Social Economic Framework

Healthy behaviors are thought to be maximized when environments and policies support healthful choices, and individuals are motivated and educated to make those choices (Ottawa Charter for Health Promotion, 1986). Providing environmental or individual supports is not enough to support meaningful and lasting change. Thus, a central conclusion of the Social Ecological model is that combination of both individual-level and environmental/policy-level interventions are required to achieve substantial changes in health behaviors.

Revisiting the Social Ecological Framework allows for examination of how multiple levels within the framework may be contributing to the climate of increased food insecurity among students at the University of Saskatchewan. The interpersonal, intrapersonal and community levels are the main focus of the study; these describe the characteristics of the student body as well as the food environment at the University of Saskatchewan. Inter and intrapersonal factors are important to understanding barriers to food security and adequately tailor effective interventions that may produce meaningful and long lasting results. The interpersonal and intrapersonal factors provide one foundation of understanding and include characteristics such as age, income, and gender among others, as well as relationships between these factors such as family and culture.

Finally, the food insecurity issues facing the University of Saskatchewan student community need to be understood within the greater societal level, which includes social and cultural norms that structure the inequities experienced by some student groups. Some of these

factors may include normalizing the “starving student”, tuition pricing, student debt, the national job market and more. Once the interplay between these various levels is fully understood, the University of Saskatchewan can work implementing a comprehensive policy strategy to better meet the needs of food insecure students on campus.

1.44 Revisiting Research Questions:

1.44.1 What is the prevalence of food insecurity among students at the University of Saskatchewan?

Quantitative survey results revealed that 39.5% of students who completed the online survey at the University of Saskatchewan had experienced some level of food insecurity in the past twelve months, with 11% experiencing marginal food insecurity, 21% experiencing moderate food insecurity and 7.5% experience severe levels of food insecurity. This value is consistent with what is being seen in other research emerging across Canada and internationally.

1.44.2 Does a relationship exist between student demographic characteristics and income-related household food security?

Yes, as previously mentioned both the quantitative survey data, and the qualitative interviews indicate that certain student sub populations are experiencing food insecurity at elevated rates compared to the larger student body. These students include international students, students who are parents, students who are female (although not included in the multivariate model due to collinearity with parent variable), graduate students, possibly First Nations students (further research required), as well as students whose primary source of income is government student loans. More research is needed to better understand the systematic factors contributing to the increased vulnerability of these students to design effective interventions to support them during this critical life transition.

1.44.3 What are the perceived barriers to food security to at the University of Saskatchewan?

The primary barrier to food security is inadequate income. While this exploratory study did not focus primarily on these income-related factors, possible suggestions that emerged from the literature review, the survey results and the qualitative interviews include low student wages, high cost of living, high cost of education, and the inadequacy of the student loan program

among others. More research into student poverty should be conducted in order to inform restructuring student loan and tuition costs.

Other contributing barriers to food security emerged primarily during the interview phase. These barriers included the physical isolation of campus from affordable food retail outlets, time constraints, lack of food preferences available on campus, and intersecting levels of oppression, among others.

1.44.4 Student coping mechanisms

Coping strategies used by students in this study were varied and complex. There was a significant overlap with coping strategies used to manage times of financial uncertainty that perhaps cannot be separated from coping strategies used to manage food insecurity. This was evident in the both the quantitative and qualitative study results. In response to the survey question inquiring about coping strategies used during times of food shortages or perceived food shortages there were several food secure students who also responded as having utilized these coping strategies. This could mean that the measurement tool did not accurately capture all of the food insecure students, or it could be that coping strategies used by students to manage financial uncertainty are not specifically related to food insecurity.

In the qualitative results student support providers explained numerous coping methods that students used during times of food insecurity or anticipated food insecurity, including selecting low-quality, energy dense foods, use of stimulants such as caffeine, among others.

Meal Exchange, Hungry for Knowledge, report addressed myths of student poverty, one of which was students' inability to budget their money (2016). The authors concluded that student were not provided with enough money to budget in the first place creating a environment where students are more vulnerable to financial and food insecurity. This account seems likely given that previous research on both the required living wage and adequacy of student loans are falling short of meeting costs of basic daily living expenses. University-level strategies should address financial access to healthy foods.

Both the survey results of the student support providers indicated hesitation of students to access the campus food bank or other charitable models. While 39.5% of students who responded to the survey had experienced some level of food insecurity in the past twelve months,

less than 1% had accessed the on-campus food banks, a number that was similar to amount of students who stole food as a strategy to cope with food insecurity. Student support providers spoke of the stigma of charity, feelings of shame or lack of dignity associated with utilizing the food bank and suggested students would not access this resource if it could be avoided.

Interviews also provided a platform for the discussion of conceivable supports that can help to encourage student success.

1.44.5 Potential Impacts of food insecurity on the students' health and academic outcomes?

The literature review, quantitative survey results and qualitative interviews indicate that students who have experienced food insecurity in the last twelve months believe it has negatively impacted their physical and mental health. The Hungry for Knowledge, Meal Exchange report from across five university campuses suggested that approximately 25% of students who have experienced food insecurity in the last year believe that it has negative impacted their physical health and roughly 20% believe it has negative impacted their mental health (Meal Exchange, 2016). At the University of Saskatchewan 25% and 23% of students who were identified as having experience food insecurity in the past twelve months indicated that they believed their physical and mental health has suffered as a result, respectively. Interviews with student support providers suggested that students often compromise by accessing more affordable, low-quality food in an attempt to stretch their food budget, potentially resulting in poor nutrition and/or increased obesity. Student support providers also commented on the additional stress that food insecurity could add to an already potentially stressful time of life.

Current literature agrees; while this has not been fully explored among university students, individuals in households characterized by food insufficiency had significantly higher odds of reporting poor/fair health, of having poor functional health, restricted activity, multiple chronic conditions, of suffering from major depression and distress, and of having poor social support (Tarasuk et al, 2012). Studies support that when individuals feel as though their money will not last they will sacrifice food quality for cost savings, contributing to the risk of obesity (Tarasuk et al, 2012).

Links between academic performance and good nutrition have been well studied among children and find that children who are well nourished show improved academic outcomes and have increased ability to concentrate compared with children who are undernourished. This same effect has not yet been directly measured in the population of university students but seems plausible (Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). More research should be conducted to explore the potential impact of student poverty and food insecurity on student academic outcomes as well as the long term implication that may have for the student.

1.45 Study Limitations

The simple random sample design of the quantitative survey adds strength to the generalizability of this survey to the greater student body (Jicks, 1979). However, it is important to acknowledge the limitations of this study; Food insecurity is a complex issue that is difficult to capture. The cross-sectional design, and self-reported information are important limitations. This type of research design is not reliable for hypothesis testing, rather is suited for hypothesis generation.

Other possible limitations of this research include self-selection for survey participation. While the response rate achieved in this study is the highest out of those studies found in the literature search and a simple random sample was used to reduce bias, it is possible that those who completed the survey were more motivated due to their personal experiences of food insecurity. The response rate to this survey was good compared to typical online surveys, which generally have response rates of between 11 – 15% (Morse, 1991; Chaparro et al., 2009; Hughes et al, 2011; Freudenberg et al, 2011; Patton-Lopez, et al, 2013; Booth and Anderson, 2016). A higher response rate improves the validity of the study by being more representative of the overall student body.

Potential study limitations with the qualitative interviews include conducting the interviews with student support employees rather than with the students themselves. There are possible validity issues as a result of documenting the perceptions of student experiences rather than firsthand accounts.

As mentioned in the Meal Exchange report: Hungry for Knowledge, student food insecurity is different from general household food insecurity (2016). While individuals and households in the general population may experience chronic food insecurity for extended periods of time, students most likely experience transitory food insecurity that may or may not last beyond their time in school (the real issues is if it prevents them from being able to complete their education) and it is difficult to determine if the student is experiencing food insecurity from education-related factors or if they come from a household that is already food insecure or at risk of food insecurity (2016).

Additionally, graduate students were identified in phase one of the study as being a student group that was particularly vulnerable to food insecurity. However, we were not able to access a graduate student support worker for an interview, possibly resulting in gaps in the analysis.

CHAPTER 6: CONCLUSIONS

This study used multiple methods in an attempt to gather rich data to better understand the food situation of students attending the University of Saskatchewan. The results of this exploratory research project indicate that students appear to be at greater risk of experiencing food insecurity compared to the overall Canadian population, and with some student sub-groups at even greater risk than others. At the University of Saskatchewan some of the student subpopulations showing higher prevalence of food insecurity included international students, students who are parents, female students, possibly First Nations students (status and non-status), graduate students as well as students whose primary source of income is government student loans.

Analysis of the research data reveal that the primary barrier to food security is income adequacy, however interview results indicated other potential barriers to food security on campus including high cost of living, high cost of education and education-associated expenses, physical isolation of the campus from affordable food retail outlets, demanding student schedules, isolation from social support networks, and intersecting levels of oppression. Interview participants also identified potential implications of food insecurity on students including diminished learning outcomes, as well as negative impacts on student mental and physical health. Students who experienced food insecurity in the last twelve months, self-reported that their mental and physical health had suffered as a result of food insecurity, as well as their social life and academic standing. More research is needed to determine the implications of these outcomes throughout the students' time enrolled in university and beyond.

Both the quantitative data and the qualitative data indicate that the issue of food insecurity is not affecting students equally and some students are suffering more than others. The disproportional effects of food insecurity in the student population could be the manifestation of larger inequities in the post-secondary student learning environment. Household income, educational attainment and food security status are three social determinants of health that are tightly connected. As Collins and Paul stated, poverty is not random; some individuals are disproportionately represented as experiencing social and economic distress in Canada, including Aboriginal people, lone parents (primarily women) and new Canadians, and these groups are

more likely to experience poverty for a longer period of time (2009). These characteristics that are correlated with an increased risk of experiencing poverty in Canada are many of the same demographic characteristics that were seen to be risk factors for experiencing food insecurity in this research study. Researchers found that Canada's current initiatives aimed at increasing accessibility for underrepresented groups in the higher education systems do not fully address the systematic factors that favor success of wealthy students.

Given that postsecondary education is a current prerequisite for approximately 70% of new jobs in Canada, the majority of high school graduates will now attend postsecondary institutions (Canadian Federation of Students, 2015). This rise in postsecondary participation has created two new aspects of inequality within postsecondary education to be considered: First, researchers have charted how as one level of education becomes saturated, higher and more difficult credentials become benchmarks for attainment and second, that elitism in higher education is not only connected to higher credential levels themselves, but also pertains to differences in what, where and how one studies – including if a student has enough time, money and food to be able to focus on their studies (Bryce, Iglesias, Pullman and Rogova, 2016).

Post secondary education is a major predictor of social and economic outcomes at the individual level. These inequities that are creating barriers to student success may be perpetuating social and economic inequity in the Canadian population (Bryce et al., 2016). Therefore, it is important to consider the provision of supports that allow increased student retention for those who have academic potential but may not have the financial backing to make post-secondary education a reality.

1.46 Recommendations

Student food insecurity should be considered a major health equity priority and this should be reflected through effective policy reform that encourages an education system that provides equal opportunity for success among an increasingly diverse student body. The following are some suggestions of next steps based on the information collected through the literature review, as well as this multi-method study:

- 1) Further research should be conducted to better understand the systemic pathways to student poverty and food insecurity. Several student support providers indicated the importance

of having more research and data on this topic that will allow for tracking trends over time, measurement of interventions effectiveness and comparison of rates between different institutions to look for champions. In order to effectively collect more information it would be helpful to have standardization in the measurement tools being used to allow for better comparisons between institutions and to determine the role of context in these phenomena. It is recommended that this study may be used as a model for other educational institutions wanting to engage in similar research on their own campuses due to the standardized quantitative measures supported through qualitative inquiry. The use of a simple random sample, with sufficient promotion to allow for a significant response rate is important to the validity of the statistical analysis. The inclusion of qualitative data is also important due to the complex and often private nature of this phenomenon.

2) Survey results and interview themes identified that First Nations students and international students experienced increased prevalence of food insecurity. It is recommended that postsecondary institutions make a commitment to a more equitable learning space to allow for students to access foods that meet their needs and preferences, as well as recognize the inequities experienced by these groups. More research into this area could better inform policies and effective interventions to support these student subpopulations.

3) Interview data with student support providers suggested that the isolation of the University of Saskatchewan from the rest of Saskatoon may be contributing to the elevated rates of food insecurity among students. It is therefore recommended that the university administration engage in creative strategies to break down barriers to food access on campus; both physical and economic access. Research into what interventions have been successful in a similar context may be helpful to inform suggestions. Documentation of effectiveness of these interventions is also critical to ensure their success.

4) Given that student poverty appears to be an underlying factor contributing to student food insecurity it is recommended that campus policies look for ways to support affordable student living such as providing affordable student housing options and providing student employment opportunities that pay a basic living wage. The current living wage recommendation for Saskatoon is \$16.77, however the current student pay rates at the University of Saskatchewan range from \$11.34 for a first year student up to \$14.24 for a fourth year student. The University

should act as a role model in the community to offer a fair wage for employment that can better help students to meet their basic living costs.

5) Finally, it is recommended that university administration meaningfully engage with the research results and continue the conversation. Due to the complexity of the issue of food insecurity it is important to bring a diverse group of stakeholders into the conversations. These stakeholders could include university administration, researchers and students who represent the demographic groups with the highest rates of food insecurity in order to understand the systemic pathways contributing to food insecurity on campus. These working groups may help advise of campus policies to support health equity and create opportunities for success in all student populations during this critical stage of life.

On a national scale it is important to take a close and critical look at the current trends in postsecondary education, including student poverty, student debt and how the university funding model may impact opportunity for social and economic success in the Canadian population.

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APPENDICES

1.47 Appendix 1 – Statistical Analysis

1.47.1 Research Question #1:

Table 2: Prevalence of FS in UofS postsecondary students

Food Security Status	U of S (N = 1282)
Food secure	775 (60.4%)
Marginally Food Insecure	141 (11%)
Moderately Food Insecure	269 (21%)
Severely food insecure	96 (7.5%)
Total	1282 (100%)

1.47.2 Research Question #2: Demographic characteristics of UofS students, compared with the main outcome variable (FS)

Table 2: Student Self-Described Gender Compared with Food Security Status

Food security status	Female	Male	Other
Food secure	496 (58.6%)	278 (64.4%)	1 (33.3%)
Food insecure	351 (41.4%)	154 (35.6%)	2 (67.7%)
Total (n=1282)	847 (100%)	432 (100%)	3 (100%)

P = 0.085

*Not significant (33%) of cells did not meet the chi square criteria

Used likelihood ratio test

Table 3: Distribution of student demographic characteristics variables

<i>Characteristic</i>	<i>n</i>	<i>Food Secure (%)</i>	<i>Food Insecure (%)</i>	<i>P-value</i>
<i>Gender:</i>				0.085
<i>Female</i>	847	59	41	
<i>Male</i>	432	64	36	
<i>Other</i>	3	33	67	
<i>Total</i>	1282			
<i>International Students:</i>				<0.001
<i>Yes</i>	137	42	58	
<i>Canadian Students</i>	1145	63	37	
<i>Total</i>	1282			
<i>Parents</i>				0.003
<i>Yes (At Least One Child)</i>	106	47	53	
<i>Not Parent</i>	1176	62	38	
<i>Total</i>	1282			
<i>Newcomers To Canada</i>				<0.001
<i>Newcomers</i>	133	41	59	
<i>Canadians 5+ Years</i>	1098	64	36	
<i>Total</i>	1282			
<i>First Nations Students</i>				<0.001
<i>First Nations (Status and Non-Status)</i>	58	36	64	
<i>Non First Nations Students</i>	1224	62	38	
<i>Total</i>	1282			
<i>Living Arrangement</i>				<0.001
<i>Living with Support</i>	553	67	33	
<i>Living without Support</i>	726	55	45	
<i>Total</i>	1281			
<i>Program level</i>				0.717
<i>Undergraduate</i>	1073	61	39	
<i>Graduate or Higher</i>	209	60	41	
<i>Total</i>	1282			
<i>Primary Source of Income</i>				<0.001
<i>Government Student Loan</i>	251	45	55	
<i>Scholarship/Bursary</i>	126	61	39	
<i>Bank Loan</i>	60	52	48	
<i>Research/Teaching Assistantship</i>	41	61	39	
<i>Savings</i>	202	71	29	
<i>Family</i>	259	69	31	
<i>Employment</i>	295	62	38	
<i>Total</i>	1234			

1.47.3 Research Question #3: Strategies for times of low food security:

Table 7: Frequencies of Stratgies used during times of Low Food Security

		FSstrategies			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Friend or Relative	378	9.3	13.3	13.3
	Borrow Money	246	6.1	8.7	22.0
	Food Bank	13	.3	.5	22.5
	Credit Card	21	.5	.7	23.2
	Delay Buying textbooks	411	10.2	14.5	37.7
	Delay Paying Bills	208	5.1	7.3	45.1
	Give up services	165	4.1	5.8	50.9
	Sell of Pawn possessions	109	2.7	3.8	54.7
	Work more	67	1.7	2.4	57.1
	Apply for loan or bursary	267	6.6	9.4	66.5
	steal food	176	4.3	6.2	72.7
	Go to campus event for food	10	.2	.4	73.1
	Go to places for wroship for food	189	4.7	6.7	79.8
	Other	13	.3	.5	80.2
	none	560	13.8	19.8	100.0
	Total	2833	70.0	100.0	
	Missing	System	1214	30.0	
Total		4047	100.0		

1.48 Appendix 2 - Survey Consent Form

Dear Students,

You have been randomly selected to participate in a survey to obtain information about student food security and life circumstances. The information from this survey will help us better understand the challenges faced by students. We will also use this information to find out if current campus programs and services meet student needs. Your participation is voluntary and confidential. If you do decide to participate in this study, you are still free to withdraw at any time by closing your web browser.

To thank participants, every student who completes the survey will be automatically entered in a random draw to win an iPad, or one of four \$20.00 gift certificates for Louis' Pub. Please ensure you complete the survey by the closing date March 13th, 2015.

If you have any questions or concerns about the survey contact Rachel Engler-Stringer at 966-77839 or Lynn Kuffner in Student Health Services at 966-5773.

Thank you for your cooperation!

[Instructions]

The University of Saskatchewan Behavioral Research Ethics Board has approved these types of studies regarding the quality of programs. Please be assured that all responses will remain confidential. No individual's answers will ever be identified in any report. In addition, your participation is voluntary, though we hope you will respond. Some questions in the survey are mandatory in order to proceed to the next question; however, you have the right to skip questions or quit the survey at any time without consequence. Survey results, in summary form, will be shared with the university community and may be published in aggregate form once the report has been completed. By completing and submitting the questionnaire, your free and informed consent is implied and indicates that you understand the above conditions of participation in this study. Your right to withdraw data from the study will apply until the results of the study have been aggregated and written as a report. After this it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data. If you have any questions or concerns about your rights as a participant, please contact the Research Ethics Office (ethics.office@usask.ca or 306.966.2084).

1.49 Appendix 3 - Interview Consent Form

Date:

Study Name: Investigating Student Food Security at the University of Saskatchewan
Researchers: Caitlin Olauson (Master's Student), Rachel Engler-Stringer (Principal Investigator)

Purpose of the Research: To determine the prevalence and severity of food insecurity among students attending the University of Saskatchewan. To explore perceived barriers to food security on campus and to provide a model for other universities across Canada, wishing to engage in similar research projects.

Voluntary Participation: Your participation in the study is completely voluntary and you may choose to stop participating at any time

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researchers, the University of Saskatchewan, or any other group associated with this project. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

Confidentiality: Unless you choose otherwise, all information you supply during the research will be held in confidence and unless you specifically indicate your consent, your name will not appear in any report of publication of the research. Although the data from this research project will be published and presented at conferences, the data will be reported in aggregate form, so that it will not be possible to identify individuals. Moreover, the Consent Forms will be stored separately from the (materials used), so that it will not be possible to associate a name with any given set of responses

Data will be collected with handwritten notes as well as with digital audio. Data will be stored for 5 years and when no longer required, the data will be destroyed. All paper files will be shredded and all electronic files will be deleted.

Your data will be safely stored and locked.

I grant permission to be audio taped:

Yes: ___ No: ___

I wish to remain anonymous:

Yes: ___ No: ___

You may quote me and use my name:

Yes: ___ No: ___

Follow Up:

Questions about the Research?

If you have questions about the research in general or about your role in the study, please feel free to contact xxxxx.

This research has been reviewed and approved by the University of Saskatchewan Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. This project was reviewed on ethical grounds by the University of Saskatchewan Behavioral Research Ethics Boards.

Your signature below indicates that you have read and understand the description provided; I have had an opportunity to ask questions and my/our questions have been answered. I consent to participate in the research project. A copy of this Consent Form has been given to me for my records.

Name of Participant

Signature

Date

Researcher's Signature

Date

1.50 Appendix 4 - Quotation Consent Form



Research Ethics Boards (Behavioural and Biomedical)

~~TRANSCRIPT~~ QUOTATION[S] RELEASE FORM

In cases where direct quotations will be reported that may compromise the anonymity of participants, it may be appropriate to afford participants the right to verify the accuracy of their responses and/or of the interpretation given to them. Please see our application guidelines for a discussion of these issues. When a transcript release form is appropriate, it should be signed after the participant has had the opportunity to read and revise his/her transcript in order to acknowledge that it accurately portrays what he/ she said. For instance, you may wish to use wording similar to the following for a Data/Transcript Release Form:

Title:

I, _____, have reviewed the ~~complete transcript~~ the quotation[s] of my personal interview in this study, and have been provided with the opportunity to add, alter ~~, and delete information from the transcript~~ as appropriate. I acknowledge that the ~~transcript~~ quote[s] accurately reflects what I said in my personal interview with [name of the researcher]. I hereby authorize the release of this ~~transcript~~ quotation[s] to [name of the researcher] to be used in the manner described in the Consent Form. I have received a copy of this Data Release Form for my own records.

Name of Participant

Date

Signature of Participant

Signature of researcher

1.51 Appendix 5 - CCHS Household Food Security Survey Module

From: Household Food Insecurity in Canada, 2012

The following questions are about the food situation for your household in the past 12 months.

Q1. Which of the following statements best describes the food eaten in your household in the past 12 months, that is since [current month] of last year?

- You and other household members always had enough of the kinds of foods you wanted to eat.
- You and other household members had enough to eat, but not always the kinds of food you wanted.
- Sometimes you and other household members did not have enough to eat.
- Often you and other household members didn't have enough to eat.
 - Don't know / refuse to answer (Go to end of module)

Question Q1 is not used directly in determining household food security status.

STAGE 1 Questions 2 - 6 — ask all households

Now I'm going to read you several statements that may be used to describe the food situation for a household. Please tell me if the statement was often true, sometimes true, or never true for you and other household members in the past 12 months.

Q2. The first statement is: you and other household members worried that food would run out before you got money to buy more. Was that often true, sometimes true, or never true in the past 12 months?

- Often true
- Sometimes true
- Never true
- Don't know/refuse to answer

Q3. The food that you and other household members bought just didn't last, and there wasn't any money to get more. Was that often true, sometimes true, or never true in the past 12 months?

- Often true
- Sometimes true
- Never true
- Don't know/refuse to answer

Q4. You and other household members couldn't afford to eat balanced meals. In the past 12 months was that often true, sometimes true, or never true?

- Often true
- Sometimes true
- Never true

- Don't know/refuse to answer

IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q5 AND Q6; OTHERWISE, SKIP TO FIRST LEVEL SCREEN (These questions were removed from our survey because we were only investigating income related adult household food security status).

Q8. In the past 12 months, since last [current month] did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?

- Yes
- No (Go to Q9)
- Don't know / refuse to answer

Q8b. How often did this happen?

- Almost every month
- Some months but not every month
- Only one or two months
- Don't know/refuse to answer

Q9. In the past 12 months, did you (personally) ever eat less than you felt you should because there wasn't enough money to buy food?

- Yes
- No
- Don't know / refuse to answer

Q10. In the past 12 months, were you (personally) ever hungry but didn't eat because you couldn't afford enough food?

- Yes
- No
- Don't know / refuse to answer

Q11. In the past 12 months, did you (personally) lose weight because you didn't have enough money for food?

- Yes
- No
- Don't know / refuse to answer

SECOND LEVEL SCREEN (screener for Stage 3): If AFFIRMATIVE RESPONSE to ANY ONE of Q7-Q11, then continue to STAGE 3; otherwise, skip to end.

STAGE 3 Questions 12 - 16 — ask households passing the Second Level Screen

Q12. In the past 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?

- Yes
- No (IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q13; OTHERWISE SKIP TO END)
- Don't know /refuse to answer

Q12b. How often did this happen?

- Almost every month
- Some months but not every month
- Only one or two months
- Don't know/refuse to answer

1.52 Appendix 6 - Interview Schedule

Could you please tell me a little bit about your role at the U of S?

How long have you been working in this position?

Quick explanation of food security and the food security measurement tool:

According to the Food and Agriculture Organization (FAO) of the United Nations, food security exists when “all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. The experience of food insecurity can range from concerns about running out of food before there is more money to buy more, to the inability to afford a balanced diet, to going hungry, missing meals, and in extreme cases, not eating for a whole day because of a lack of food and money for food. Food security in Canada is measured using the CCHs survey. Based on the number of positive responses to the questions posed, for this report and for subsequent issues, households are classified as either food secure or marginally, moderately, or severely food insecure. Food secure households are those who gave no indication of any income related problem of food access.

Do you have any questions relating to the definition or measurement of food security?

Our initial research indicates that students are experiencing food insecurity at a rate higher than the general population - How consistent is this with what you are observing? Can you please describe for me what factors may be contributing to student food insecurity?

From your observations, which groups students do you think are at a greater risk of food insecurity? Can you speak to why you think this may be?

What impacts do you think food insecurity may be having on students’ mental and physical health?

Have you observed that student food insecurity is having an impact on student academic success at the UofS? If so, what impacts have you observed?

What types of strategies do think students are using to cope with periods of food shortages?

Have you observed any trends over time in student food security over your time working on campus? (Do you think food security may be improving or declining among students, or staying the same?)

What supports do you know about that are currently in place for students at the UofS who are experiencing food insecurity? (probes: On campus, off campus, etc)

Please speak to whether you believe that the current support services offered to students seem to be meeting their needs? What else do you think should be done to help improve student support?

Probes: (For example, there are on-campus emergency food services, do you think this is sufficient? What about the fresh food market? Free food at campus function? Mental support services through Campus Health? Do you think that there are affordable on-campus food options? Do you think there are any options that could be added to help relieve student food stress?)

Is there anyone you would recommend that we include in the interview process?

Are there any questions or additional comments you would like to make at this point?

1.53 Appendix 7 - Reflexive Journal Sample

The field notes were primarily jotted down in a paraphrased format with a pen and note pad. Occasionally I would type to field notes directly into NVivo if I had my laptop with me and had to time to sit and go through the process more thoroughly before or after conducting the interview. Notes primarily consisted of notes to self for techniques I could improve upon, recognition of my own bias and how that may have affected the interview process as well as general feelings after each interaction. I would revisit these notes during the transcription phase and primarily during the coding phase to help make myself aware of my role in the interpretation. I found the note taking process a useful exercise, especially as a new interviewer. However, the usefulness of my notes to others or without supplementary data is limited. The tape recorded interviews was critical to allow me to give my full attention to research participants and to fully engage in the interview process without distraction.

Included below are selected experts of a few journal entries, the entries were selected based on being more significant entries and are not sequential.

Tuesday, February 2, 2016

Today will be my first interview, besides the pilot interview I conducted about ten days ago. I chose to do the first interview with the women's centre coordinator because I know her personally, she is a young researcher herself and is very outspoken and kind. I thought that starting with her would be less intimidating and perhaps if I need to work out a few kinks in my interview style she would be an understanding participant.

We will be meeting at her office at 5:30PM. One thing I will need to be mindful of, that I learned during the pilot phase, is to not engage in conversation. Particularly because I know her. I find interviewing a little bit awkward and in the pilot phase I would find myself tempted to engage conversationally to put the participant at ease, or maybe myself. But this is not what you are supposed to do. I need to let the interviewee direct the conversation and stick to using simple and engaging probes.

...

Thursday, February 18th, 2016

I just finished interviewing the director of the Gordon Oaks Red Bear Centre (Aboriginal Student's Centre). My interview style was not strong today. The interviewee had a lot to say on the topic and was incredibly well-informed and well-spoken. I did not keep us on task with the specific questions outline in the interview schedule. I was intimidated and I think that resulted in me being quite passive in the process. While the data collected is rich and useful it will take significantly more work to transcribe and elicit codes from later. Watch and listen to great interviewers to pick up techniques for politely guiding interviewees back to the topic.

...

Wednesday March 16, 2016

Today's interview impacted me the most intensely, emotionally, of all the interviews thus far. It has made me think that perhaps interviews directly with those who have been affected by food insecurity may have had a stronger impact than interviewing student support provides. The Interview was with the director of the comfort room on campus, who is also a student parents and drew on first hand experiencing, as well as observations of others experiences in her responses. I very much identified with the participant, although I am not a parent, and could really feel the stress that providing for her child on a limited budget had had on her university experience.

In terms of interview style, I think that my technique was professional and kept us on track with the questions. I did stay for quite a while after completing the interview to chat and debrief with the interview participant and we hope to stay connected in supporting each others work.

Note: The recording devices seem to make people nervous. I am not sure what to do about that because obviously I need to make them aware that they are being recorded. The use of two recording devices seems to be particularly off-putting. Perhaps I only need to tell them about the one device and don't have to mention that I am recording on my cell phone as well for back-up. This is something I should follow-up with Rachel about. Maybe there is a trick to making people feel more at ease.