

Experiences of Food Insecurity Among
Undergraduate Students at the University of Waterloo:
Barriers, Coping Strategies, and Perceived Health
and Academic Outcomes

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Acknowledgements

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Dedication

I would like to dedicate this thesis to the 14 student participants who shared their stories and experiences with me. Thank you for helping to advance our understanding of food insecurity among post-secondary students, which is one small step towards a future where students need not go hungry for an education.

Abstract

Background: Food insecurity, which refers to uncertain or inadequate access to food due to financial constraints, represents a serious public health problem in Canada. Although post-secondary students may be vulnerable due to high tuition fees and related factors, relatively little is known about experiences of food insecurity among this population.

Research aim and objectives: To gain a better understanding of the experience of food insecurity among University of Waterloo undergraduate students, including perceived barriers and facilitators to food security, the strategies used to manage shortages of food and money for food, perceptions regarding implications for health and academic achievement, and suggestions for improving food security for post-secondary students.

Methods: A mixed methods design included semi-structured in-depth interviews complemented by demographic and health surveys. The adult items from the Household Food Security Survey Module were used to determine participants' food security status. Students were recruited using flyers posted on campus and distributed at the Feds Student Food Bank. Eligible participants included undergraduate students who lived off campus and provided an indication of compromised food access based on inadequate finances in response to an online screening questionnaire (n=14). Study design and thematic analysis was informed by Layder's (1998) adaptive theory and Alaimo's (2005) conceptual model of food insecurity.

Results: Students felt that their food security included both quantity and quality of food. Students experienced common elements, including a preoccupation with the food supply, timing of food shortages, qualitative food compromises, and a desire to be independent. Students encountered a variety of barriers to food access and healthy eating, such as the food environment, food literacy, and time. However, precarious financial situations contributed most prominently to students' food insecurity. Students bought into the norm of the starving student lifestyle, whereby precarious finances, unhealthy eating,

limited time, and stress over school were typical and commonplace. Students adopted a variety of coping strategies to manage their food supply, including accessing emergency food programs, finding free meals, food sharing, borrowing food or money for food, normalizing their situation, and demonstrating resiliency. Further, food insecurity was perceived to have a negative impact on their academic achievement and health and wellbeing.

Conclusions: This study has begun to fill the gap in research on student food insecurity and its implications in Canada. These exploratory findings suggest that food insecurity among post-secondary students is a serious issue with critical implications. These findings add to the growing argument that Canadian financial support for post-secondary students is inadequate for the maintenance of food security during university. Future strategies must address the root financial causes of food insecurity among students in order to create effective, long-lasting change.

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1. Introduction

Food insecurity, which refers to uncertain or inadequate access to food due to financial constraints, is a serious public health problem in Canada (1). In 2014, 3.2 million Canadians lived in households that experienced some degree of food insecurity (1). Food insecurity has been associated with inadequate nutrient intakes and a variety of chronic conditions among adolescents and adults (2–8). Food insecurity has also been linked with markers of poor mental health, including depression, anxiety, and suicidal ideation, particularly among women, adolescents, and young adults (6,8–10). Food insecurity has psychosocial consequences as well including alienation, shame, and guilt (11). The majority of Canadian research on food insecurity has focussed on high-risk groups, such as low-income mothers and ethnic minorities. To date, there has been little examination of this issue among a potentially vulnerable population, post-secondary students (1,11,12).

Financial strain is a common phenomenon among post-secondary students in Canada, making them a vulnerable group from a food security perspective (13–16). The average student attends post-secondary school with the goal of improving their job prospects, which is accompanied by high financial costs. In 2010, the average Canadian undergraduate student carried approximately \$26,000 in student debt upon graduation, and the proportion of students relying on loans is increasing (13,17,18). Several factors are likely contributing to precarious finances among students, including reduced federal transfer payments to provinces, which has resulted in rising tuition fees (13,15,19,20).

Despite the potential for students to be prone to food insecurity due to financial strain, very little is known about the prevalence and implications of food insecurity among this population. Cross-sectional surveys conducted at universities in Australia and the United States have revealed prevalence estimates ranging from 25-59% of the total student population (21–24). Further, these

studies indicate that food-insecure students have a lower grade point average, higher debt, and poorer general health in comparison to food-secure students (21,22,24,25).

In Canada, researchers found similar rates of student food insecurity as have been seen in the limited Australian and U.S. research; using a comprehensive household food security measure from the Canadian Community Health Survey and a random sampling procedure, between 28.6% of students at University of Saskatchewan and 38.1% of students at Acadia reported moderate to severe food insecurity in 2014 (26). A qualitative thesis at the University of Lethbridge in Alberta found that post-secondary student food bank visitors related various health issues to the nutritional inadequacy of their diets, yet did not delve into student perceptions of food insecurity and health (27). A similar investigation of student food bank users in Kingston, Ontario found that students experience food anxiety, which has been found to be a key component of food insecurity among other populations (11,28,29).

These findings are troubling, yet prior research suggests that there is an expectation that a student will become financially stable and food-secure after graduation (19). Therefore, post-secondary students may view food insecurity due to insufficient finances as socially acceptable due to the transient nature of this time period. In addition, the western societal norm of the 'starving student', the idea that students subsist off of cheap or unhealthy foods throughout university, may also perpetuate the acceptability of food insecurity during university (30). However, the limited existing research suggests that food insecurity may pose a risk to students in terms of negative health and wellbeing implications, as well as compromising their university experiences and success (21,22,24,25). Yet, the few peer-reviewed studies examining food-insecure post-secondary students in Canada have not revealed how students themselves perceive this experience. There is a lack of qualitative research incorporating Canadian students' lived experiences, perceptions, and perspectives of food insecurity. It is crucial to better understand the nature of food insecurity among this unique population, as the experience may differ from what we already know about food insecurity among other populations. Gaining a better

understanding this experience is essential for designing interventions to effectively address food insecurity and better support good health, wellbeing, and academic success among the post-secondary student population.

Therefore, the purpose of this study was to explore the experiences of food insecurity among University of Waterloo undergraduate students. The aim was to better understand the situations that lead to shortages of food or anxiety about having enough food, the ways in which students try to manage such shortages, and perceptions about how compromises in food quality and/or quantity impact health, well-being, and academic achievement. To achieve these aims, semi-structured interviews were conducted with a sample of undergraduate students enrolled at the University of Waterloo, who provided an indication of some degree of food insufficiency over the past 12 months in a screening survey. Findings from this exploratory study will begin to shed light on the day-to-day experiences of post-secondary students struggling to access adequate food, will help to inform future research, and provide insights to provincial and intra-university policies to support student food security, health, and well-being.

2. Literature Review

2.1. Food Insecurity

2.1.1. What is Food Insecurity?

Definitions of food security and insecurity vary widely and incorporate quantity and quality of food, nutrient content, food safety, cultural appropriateness, and social acceptability (31–33). The Food and Agriculture Organization of the United Nations (FAO UN) (2008) defines food security as occurring “when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (31, p.1). Conversely, the USDA defines food insecurity as occurring when “the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain” (33, p.43). Similarly, Health Canada defines food insecurity as “the inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so” (32).

According to the FAO UN (2008), food security is comprised of four core dimensions; access to food, availability of food, utilization of food, and the stability of these three dimensions over time (31). Food access refers to the ability to obtain food and is influenced by the environment, economic and political interests, and other societal factors (34). Food availability refers to the physical presence of food and is related to food production and supply (31). The utilization of food refers to the nutritional composition of food and the body’s ability to use these nutrients to maintain health (31,35). In addition, food security is not a temporally stable condition as various events or shocks can alter food security status at any point in time (36).

Food insecurity can be experienced at a variety of levels, including at a global or national level, a community level, and at an individual or household level (37). While community food security involves

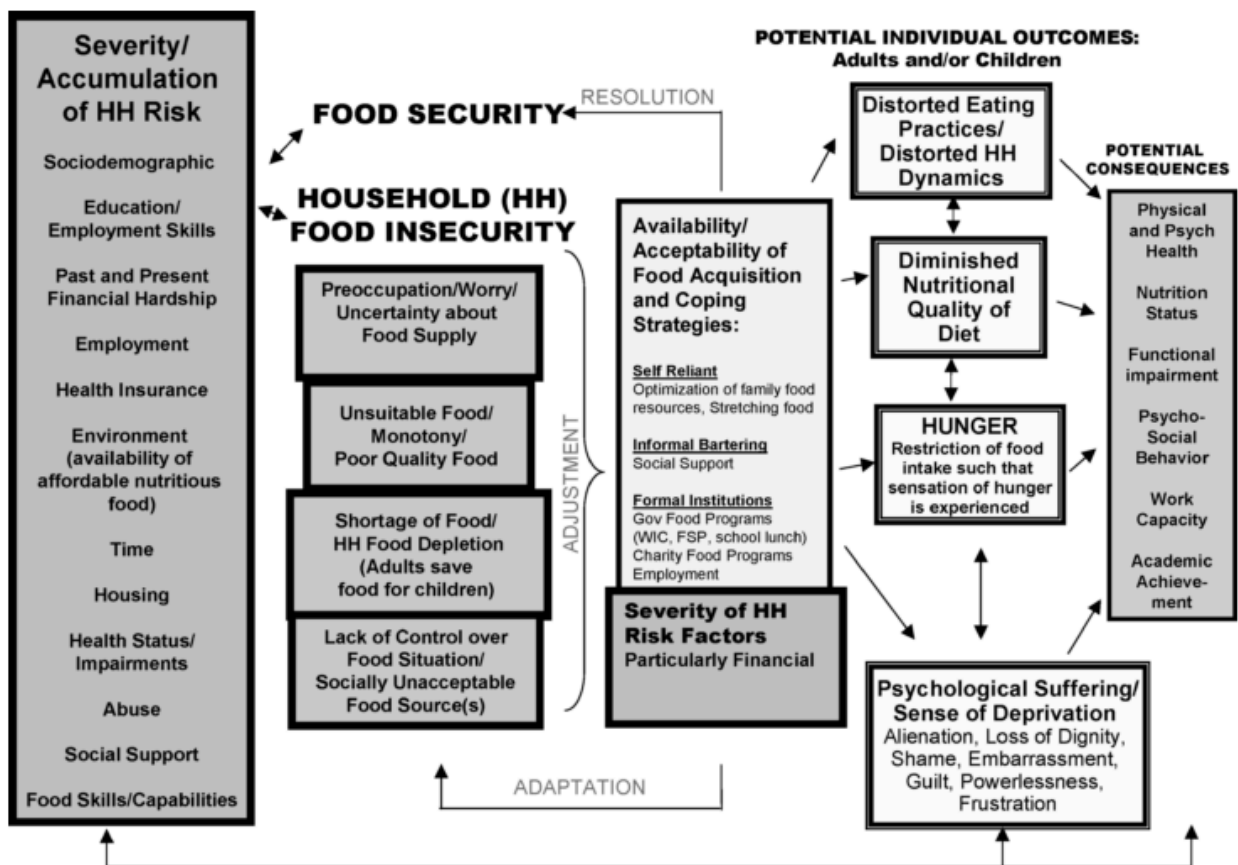
sustainability, equity, and environmental health within the food system, individual or household food security involves aspects of financial access to sufficient nutritious food. At the level of households and individuals, measures of food insecurity are considered markers of material deprivation (1,37,38). At the household level, food insecurity is characterized by the worry that food will run out with no money to purchase more, eating poor quality or monotonous foods, reducing the size of meals or skipping meals, and in extreme cases, going without food for whole days at a time (39,40).

2.1.2. Alaimo's (2005) conceptual model of food insecurity

Existing theoretical frameworks provide a lens through which to view the experience of food insecurity. Alaimo's (2005) conceptual model of food insecurity is one of the only frameworks that displays a wide variety of factors related to food insecurity, and was informed by a variety of qualitative studies conducted with food-insecure, low-income families in Canada and the US during the 1980s and 1990s (11,29,41,42). According to Alaimo's model, there are four main components that are characteristic of household food insecurity (43). The first component is anxiety and a preoccupation with food that occurs as a result of dwindling household food supplies. The second component is inadequate quality of food, with the potential for foods available to the household to be unsafe or spoiled, monotonous, or lacking in nutritional value. The third component is an insufficient amount or quantity of food available for all household members. The fourth component is an inability to control the household food supply, resulting in feelings of alienation and the 'socially unacceptable' acquisition of food through food banks or soup kitchens (43). Alaimo's framework includes a compilation of financial, socio-environmental, and demographic risk factors for household food insecurity that have been identified in the literature (36,41-43). These risk factors interact with various coping strategies to influence a households' adjustment or adaptation to food insecurity. Adjustment or adaptation techniques depend on the severity of food insecurity, and determine whether the family can transition into a food-secure

state (43). While adjustment may take place when food insecurity is a short-term phenomenon within a household, the persistence of food insecurity over time requires more long-term adaptation (43,44). Common coping strategies involve self-reliant tactics and reliance on formal structures and social support (43). Finally, adjustments and adaptations to household food insecurity can result in altered eating practices and psychological suffering, which can have implications for personal outcomes and long-term consequences for physical and mental health (45–47). The components, risk factors, coping strategies, outcomes and consequences of the food insecurity experience are shown in Figure 1.

Figure 1: Alaimo’s (2005) conceptual model of food insecurity¹



[1] Alaimo K. Food insecurity in the United States: an overview. *Top Clin Nutr* 2005;20:281–98.

2.1.3. Food Insecurity in Canada

National rates of household food security are measured in Canada using the Household Food Security Survey Module (HFSSM), which was developed and evaluated in the US and has been widely used in food security research over the past few decades (1,39,48). The HFSSM has been included in the Canadian Community Health Survey (CCHS) conducted by Statistics Canada several times over the last decade (39,48). The HFSSM is completed by a reference person from each household and consists of 18 items that address inadequate quality or quantity of food within a household due to financial constraints within a previous 12-month period. Ten items on the HFSSM assess food security among adults and eight items assess food security among children under 18 years of age (if any) within the household (48). Responses to these 18 items are used to compute a score that can be used to sort households into one of four categories; food secure, marginally food insecure, moderately food insecure, and severely food insecure [See Table 1] (40,48). The most recent nationally representative data from CCHS 2012 reveals that almost 13% of Canadian households suffered from some degree of food insecurity (39).

Table 1: Food security status, defined (48)

Food Secure	No problems with running out of food and/or limited food selection because of lack of money for food
Marginal Food Security	Worry about running out of food and/or limit food selection because of lack of money for food
Moderate Food Insecurity	Compromise in quality and/or quantity of food due to a lack of money for food
Severe Food Insecurity	Miss meals, reduce food intake and at the most extreme, go full day(s) without food

Food security is a contextual and complex issue that varies greatly depending on the development status of a country. Food insecurity in developed countries such as Canada is strongly tied to income, but can also be impacted by a wide variety of other factors that are typically also associated with income, including family size and living expenses, education, and immigration status (39,48). In certain regions of the country, geographical location and transportation are also key factors (49). For example,

northern Canadian regions experience high rates of household food insecurity, in part due to the exorbitant costs of food transport; 46.8% of households in Nunavut experienced food insecurity in 2014 (1,50).

2.1.3. Implications of Food Insecurity

Health Canada recognizes that food insecurity is an important social determinant of health (48,51). A large body of quantitative literature from Canada and the U.S. demonstrates that food insecurity is associated with markers of poor physical health and mental health, independent of other socioeconomic markers. For example, food insecurity has been connected with poor diet quality and nutrient inadequacies, diabetes, hypertension, poorer general health, and chronic disease multi-morbidity among adults (2,4–7,52,53). More recently, food insecurity has been linked with higher perceived stress, psychological distress, depression, anxiety, and suicidal ideation, particularly among young adults and women (6,7,54–57). Lazarus and Folkman (1984) describe stress as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing” (51, p.19). Food insecurity can be considered a form of adversity that contributes to ‘toxic stress’ during developmental periods, particularly among children (59). Toxic stress refers to adversity that creates prolonged activation of stress responses, which can negatively alter brain development, and result in poor physical or mental health outcomes (59). Similarly, the stressor-strain theory posits that chronic stress can strain the body and result in poor physical or mental health (58,60). However, it is unclear how young adults experience and perceive food insecurity-related stress during their time as post-secondary students, and whether this is impacting their health and wellbeing (45,61).

There are various pathways through which food insecurity could negatively impact physical and mental health. A body of qualitative research in Canada and the U.S. has explored the relationship between food insecurity and health and wellbeing. A phenomenological study conducted by Chilton and Booth (2007) among African-American women in Philadelphia revealed that physical manifestations of food insecurity, deemed 'hunger of the body', were related to mental health and wellbeing implications, which they called 'hunger of the mind' (62). The concepts 'hunger of the body' and 'hunger of the mind' demonstrate that food insecurity impacted various aspects of participants' lives and ultimately had a negative impact on their health and wellbeing (62). For example, when respondents spoke of the connection between their food access and health, they also discussed a variety of other stressful factors that can influence this relationship, including precarious employment, living in unsafe neighbourhoods, and violent interpersonal relationships (62). Hamelin et al. (2002) conducted a qualitative study of women living in low-income households in Quebec (11). Emergent themes included physical impairments like fatigue, recurring sickness, and hunger as a result of inadequate quantity and quality of food, as well as a preoccupation with the food supply that resulted in stress, anxiety, and panic attacks (11). These physical and mental health outcomes resulted in lowered concentration and work ethic at their jobs and at school due to hunger and feelings of anxiety over the household food supply (11). Similar themes have been reported in qualitative studies with food-insecure parents (63,64). These findings indicate that food insecurity may interact with health in a variety of ways, for a variety of populations.

Psychosocial factors may also play a role in the relationship between food insecurity and poor health. Qualitative research with both food-insecure adults and children have found that psychological suffering occurs as a result of food insecurity, through social exclusion, alienation, and loss of dignity (11,29,64,65). The experience of psychological suffering as a result of food insecurity can be tied to the cultural and social meaning of food. Fieldhouse states that "food has always been much more than a source of body nourishment; it has played a major part in the social life, both religious and secular, of

human groups” (66, p. xi). Food is inherently embedded in social gatherings and culture; therefore, having inadequate finances to purchase sufficient food may make a person feel socially excluded and disconnected from the celebration of cultural roots (62). Social exclusion or isolation can also result from feelings of frustration on the part of food-insecure individuals as they attempt to ‘cope’ with unsupportive economic and social security systems (11,27,67). Those experiencing food insecurity may also feel ashamed and guilty if they are unable provide food for themselves and their families, which may drive them to conceal their situation from family and friends (11,68). Conversely, food insecurity may force individuals to rely heavily on family or friends for assistance, which could exhaust social networks and contribute to social isolation (11). Finally, the stigma related to emergency food services may be the reason that only a fraction of food-insecure individuals access food from food banks (69); those who do resort to accessing these services can experience feelings of shame (70). These different psychosocial consequences of food insecurity have the potential to further impact the health and wellbeing of food-insecure individuals.

2.1.4. Canadian Responses to Food Security

While Canada does not have a national food assistance program, there are various federal and provincial financial policies in place that indirectly address food insecurity by influencing financial resources among individuals and households. In the absence of policies that directly address food insecurity, emergency food programs have become entrenched in Canadian society.

2.1.4.1. Governmental Financial Policies

Each province and territory in Canada has a minimum hourly wage that an employee can be paid within that region. A full-time worker paid the minimum wage in many provinces and territories would fall below the poverty line, placing them at risk for food insecurity (50). For example, in 2005, the Region of Waterloo estimated that a family living on a minimum wage income would be unable to afford enough

nutritious food (71). As of October 1st 2015, the government of Ontario raised the minimum wage to \$11.25/hour and tied this rate to the inflation of income (72). However, this full-time wage is still not enough to allow a worker to move above the poverty line, and is nowhere near the living wage that has been suggested for various cities in Ontario (73). A living wage refers to a wage that would allow someone to afford basic necessities, such as food and shelter (73). This wage varies between cities and communities based on regional living costs; for example, the estimated living wage for Hamilton, Toronto, Guelph, Windsor, Kingston, Brantford, and the Regions of Halton and Waterloo ranges from \$14.15 to \$18.52 (73). Although the provincial government has taken steps towards a more adequate minimum wage, this amount may still not be enough to ensure food security for those working in minimum wage jobs.

Social assistance in Canada is provided for disabled individuals as well as those struggling with unemployment. Ontario provides social assistance through Ontario Disability Support Payments (ODSP) and Ontario Works (OW) (74,75). ODSP is calculated based on the number and age of people in a family and their disability status, while OW provides financial support for Ontarians who are actively looking for employment. OW and ODSP calculate financial support based on each person's basic needs, taking into account the family size, income, assets, and shelter costs (74,75). For example, a single adult living in rental housing would receive \$744 per month through OW (76). A wide variety of reports and studies have demonstrated the inadequacy of social assistance in Canada (1,50,70,77). Similar to the minimum wage, social assistance rates in Ontario and other provinces and territories have often fallen below Statistics Canada's low-income cut off rates (77). Social assistance has also been found to increase the likelihood of Canadian households experiencing food insecurity (78,79). In addition, the most recent data from the CCHS demonstrates that over 60% of households who rely on social assistance are also food insecure (1).

The government of Canada provides special financial assistance to certain vulnerable populations, including the elderly. Old Age Security (OAS) is a monthly pension available to Canadians 65 and older (80). The maximum an older person can receive from this pension is \$546 per month (80). The Guaranteed Income Supplement (GIS) is designed to supplement the OAS, and it is available to any older person living on a low income (81). The maximum amount a single older person can receive through GIS is \$740 (81). These financial benefits may contribute to lower rates of food insecurity among the elderly compared to the general Canadian population, as the rate of food insecurity among older Canadians living alone is 7.4% (1). There have been recent recommendations from researchers that the federal government create similar financial safeguards for Canadians of all ages (50,82,83). For example, a guaranteed minimum income provided by the government is one potential strategy for providing more adequate social assistance (50,83). Another concept is a federal anti-poverty plan, which has been suggested by non-profit organizations including Canada Without Poverty and Dignity For All, to address the root causes of income insecurity in Canada (84). In general, existing financial assistance policies in Canada are not enough to protect low-income Canadians from experiencing food insecurity.

2.1.4.2. Community-Level Responses

The dearth of governmental policies addressing income support has resulted in the downloading of responsibility for food insecurity onto municipalities and communities. This has created a patchwork of community-level responses to food insecurity throughout Canada. These responses are largely unaided by governmental bodies, and therefore subsist as non-profit organizations and charities (85).

The majority of community-level responses come in the form of charitable initiatives, such as food banks, which distribute emergency food provisions to the food-insecure. Food banks first emerged in Canada as a response to the economic recession in the 1980s and were designed to be a temporary source of support for those experiencing financial difficulties (50,70). Today, food banks are a major

stopgap for hunger in communities across Canada and are experiencing rising numbers of client visits; Ontario food banks have seen a 20% increase in visits since 2008 (50).

There have been efforts made by public health units and other organizations to alleviate household food insecurity through educational and supportive services. These efforts include school food programs, community kitchens, community gardens, and community-shared agriculture initiatives like the 'good food box' (85,86). These efforts differentiate themselves from the charitable model of food assistance, by emphasizing sustainable food systems, social inclusion, and providing food skills and resources (85,86). Many of the organizations that provide these services recognize that these efforts are not sufficient to systematically alleviate food insecurity, and have created coalition groups to pressure governmental bodies on food issues. Food Secure Canada is a national organization committed to improving food sovereignty, food security, and food safety in Canada (87). Recent efforts have included the creation of a national food policy, lobbying for a national student food program, and pushing provincial and federal governments to incorporate food security into their agendas (87). Community Food Centres Canada is another organization that works to subvert the norm of the food bank, by incorporating skill building into their programming and facilitating citizen advocacy on the topic of affordable, nutritious food (88). Despite these efforts, there is limited evidence demonstrating that emergency food initiatives are effective at alleviating hunger or associated health issues, as they do not tackle the root financial causes of food insecurity (8,89–91). Moreover, it is unclear how many food-insecure individuals actually benefit from the use of community food programming, considering that rates of food bank use do not accurately reflect the prevalence of food insecurity in Canada (69,70,90,91).

2.2. Post-Secondary Student Food Insecurity

2.2.1. Prevalence and Risk Factors

Internationally, rates of student food insecurity within universities appear to be higher than national and regional prevalence estimates (21–24,92). A randomly selected sample of students at a Hawaiian university found that 21% were moderately or severely food insecure, with an additional 24% reporting marginal food security. This study used the same measurement tool as the state of Hawaii; therefore, these rates can be compared to the state-wide household food insecurity rate of 7.8% during the same time period (92). Several surveys conducted at Australian universities have found that food insecurity impacts between 12.7 and 25.5% of the student population (21,22). These rates are dramatically higher than the general Australian population, which was recently estimated to affect 5% of Australian households (21). U.S. estimates of student food insecurity range widely, from 14–59% of the student population (23–25,93). In Canada, Acadia University and the University of Saskatchewan conducted school-wide surveys of a random sample of students, and found that 26–38% of the student population experienced some form of food insecurity in 2014 (26). Once again, this rate is much higher than the 12% of Canadian households that experienced food insecurity in 2014 (1). Rates of student food insecurity in Canada are similar to rates found within particularly vulnerable groups, such as households headed by lone mothers (33.5%) (1)

Several key risk factors have been identified through the small body of literature on student food insecurity that exists from Australia and the US. Students who are financially independent from their families and those who rely on governmental assistance, such as student loans, are more likely to be food insecure (16,25,92,94–96). Gaines et al. (2014) examined the prevalence and correlates of student food insecurity at a university in the US, and found that the average student did not have the financial resources needed to cope with shocks or unanticipated expenses, which could place them at greater risk for food insecurity (25). Students who live in rental housing, either alone or with friends, are also more

likely to experience food insecurity compared to students who live with their parents (22,23,25,92,95). Finally, students who are single parents may also be at higher risk for food insecurity during university (24,93). Similar to other low-income populations who experience food insecurity towards the end of monthly pay periods, students may be prone to experiencing food shortages towards the end of the academic semester; Munro et al. (2013) conducted a survey among students at a South African university, and found that food-insecure students were significantly more likely to feel hunger towards the end of the semester compared to the beginning (96).

2.2.1.1. Financial Barriers to Student Food Security in Ontario

Food insecurity in Canada is characterized by financial insufficiency. Therefore, one of the most prominent risk factors for food insecurity is a low-income (1,49,97). In her thesis dissertation, Nugent (2011) describes various financial pathways through which Albertan post-secondary students may become food insecure; through monthly shortfalls, cumulative unexpected expenses, and income delays (27). Similar to students in Alberta, students in Ontario struggle with several major financial barriers to food security while in university.

The first major barrier to food security are the high rates of tuition in Ontario and throughout Canada (17). The federal government supplies transfer payments to Ontario universities to help cover operating fees, however, these transfer payments have been reduced in recent years. The province of Ontario now spends the least amount of money per student per year in Canada (19,20). This has resulted in universities having to supplement their operating costs with higher tuition fees. Tuition fees covered only 12% of Canadian university operating fees in 1979, yet as of 2009, tuition fees comprised 30% of Ontario university funding (20,82). The rising cost of tuition has now outpaced inflation, placing the burden on students and their families to finance a larger portion of post-secondary education (98,99). A 2013 report by the Canadian Federation of Students found that students in Ontario have the highest

average tuition rates in the country at \$7,200 per year and argue that this has contributed to a high proportion of Ontario students accessing campus food banks (100). Today, post-secondary students often have multiple sources of debt, contributing to the precarious financial situation that may lead to food insecurity (98).

A second major barrier for students relates to student loans. The federal government provides student loans through a variety of programs, the largest of which is the Canada Student Loans Program (CSLP) (99). Through the CSLP, federal government works with provincial governments to provide integrated loans to post-secondary students. In 2012-2013, federal and provincial student loans provided 472,000 full-time students with 2.6 billion dollars, amounting to approximately \$5000 per Canadian student (101). In Ontario, the average post-secondary student graduated with a total of \$22,000 in debt in 2012 (96). Meldrum et al. (2006) examined whether the financial aid received through the CSLP and the Alberta Student Loans Program (ASLP) was adequate for the purchase of nutritious food. The authors found that the average monthly cost of a nutritious food basket was \$100 higher than the amount of money allotted for food by the ASLP/CSLP (94). The authors concluded that federal/provincial student loans might be putting students at risk for food insecurity during university. The amount of money loaned to each student by the Ontario Student Assistance Program (OSAP) is determined based on that students' assessed needs; for example, parental income level is included in the needs assessment if a student is considered a 'dependent' (14). This means that the majority of loans provided through the CSLP are meant to be supplementary to parental resources or a student's own savings. Therefore, these loans may not provide a sufficient amount of money to purchase food if students do not have financial help from their parents.

A final major barrier to student food security relates to a competitive job market. Many students work part-time jobs while taking courses and the majority of post-secondary students look for full-time work in the summer to supplement their income during the academic year (102). As of 2012, the

unemployment rate for 15-24 year olds was more than double that of the 25-54 adult population at 14.3% and Ontario had the lowest rates of post-secondary student summer employment in the country at 62.4% (102,103). OSAP's needs assessment is calculated with the assumption that a student will save money during the summer regardless of whether they are able to find employment (102). Students who are unable to find a job or who are unable to save enough money from summer employment may be at risk for food insecurity during the school year. Furthermore, a survey by the Council of Ontario Universities found that nearly a fifth of recent graduates from some subject areas struggle to find full-time work six months after graduation (104). This unemployment becomes particularly problematic when OSAP loan repayments begin six months post-graduation (105). Therefore, food insecurity may be a reality for many students during university and could continue to be an issue after students leave post-secondary education.

While these financial factors in Ontario may place students at risk for food insecurity, not all students who receive financial aid are food insecure. Further research is needed to elucidate other barriers to student food security, and the impact that this experience has on post-secondary students.

2.2.2. Coping Strategies and Campus Food Banks

Research conducted with food-insecure students in Australia and the US has revealed several common strategies that students use to attempt to cope with uncertain or inadequate food access. These include accessing food or borrowing money for food from family and friends (21,106). Students also draw money for food from existing loans or lines of credit, or charge food purchases to a credit card (25,107). Many students report working one or more part-time jobs while balancing course work (21,23). Students also mentioned juggling or skipping bill payments at the end of the month when money tended to run out (106). Gaines et al. (2014) found that budgeting behaviours among students were predictive of food insecurity, indicating that budgeting may be a coping mechanism as opposed to a solution to food

insecurity (25). A small proportion of food-insecure students resort to desperate measures such as pawning personal items for money or stealing food (21). Finally, some food-insecure students report accessing emergency food provisions, either through free community meals or from a food bank (21,22).

Just as food banks exist to provide emergency food within communities, campus food banks have become entrenched on Canadian university and college campuses to provide food for students (108–110). Today, there is an emergency food program on nearly every college and university campus in the country (108). Similar to broader trends in Canada, on-campus food banks have reported higher levels of usage within the last five years (100,110–113). The Ontario Association of Food Banks reports that post-secondary students currently represent 4% of community food bank users and are one of the fastest growing groups of food bank users in the province (114) (96). Indeed, Nugent's (2011) research on campus food bank users in Lethbridge was motivated by high numbers of students accessing this service (27).

Similar to many community food banks, the food provided by campus food banks may not provide adequate nutrients and could contribute to poor health (51,115,116). Jessri et al. (2014) examined the nutritional quality of the food hampers distributed by the food bank on the University of Alberta campus, and found that hampers did not provide adequate amounts of vitamin A, zinc, and iron (115). Azurdia et al. (2011) conducted a process evaluation of the University of Ottawa's student food bank and found that volunteers and student users thought the nutritional quality of the food was poor (117).

While these reports provide some indication of rising usage of food banks on Canadian campuses and the quality of food provided by them, rates of student food bank use do not accurately reflect the prevalence of food insecurity on campuses. At a university in Queensland, Australia, Gallegos et al. (2013) found that 14-24% of food-insecure students used the campus food bank. At another Australian university, Hughes et al. (2011) found only 10% of the total student sample were even aware of available

resources on campus (21,22). This reflects broader findings that demonstrate only a fraction of food-insecure individuals use food banks as a coping strategy (69). This literature indicates that those experiencing food insecurity choose not to access food banks due to stigma or due to food being insufficient for visitors' nutritional or cultural food needs (70). It is unclear whether food-insecure students choose not to access the campus food bank as a coping strategy for similar reasons.

2.2.3. Implications and Correlates of Student Food Insecurity

Food insecurity appears to have a variety of implications for students. Several studies have found that food-insecure students struggle with succeeding in school. Maroto et al. (2014) examined 301 post-secondary students in Maryland, US, and found that food-insecure students were more likely to have a low grade point average compared to food-secure students (24). In addition, Gallegos et al. (2013) found that food-insecure students were three times more likely to have suspended their post-secondary schooling due to financial issues when compared with food-secure students (22).

While finances have been demonstrated to be a barrier to healthy eating among university students in general, food-insecure students in particular appear to struggle with eating healthfully (22,27). Gallegos et al. (2013) found that food-insecure students were 35-55% less likely to consume the recommended daily amounts of fruits and vegetables compared with food-secure students (22). This reflects Canadian literature that demonstrates associations between food insecurity and poor diet quality in low-income households (2,4,118).

Several studies have found that food insecurity is associated with students' perceived health and stress. Hughes et al. (2011) examined food insecurity among students at Griffith university in Australia, and found that food-insecure students were less likely than food-secure students to report their health as 'good' or 'very good' (21). Similarly, Gallegos et al. (2013) found that Australian students who had experienced food insecurity were twice as likely as their food-secure counterparts to report fair-to-poor

general health (22). Among South African university students, Munro et al. (2013) found that 32.8% reported reduced concentration as a result of hunger, while 10.7-12.2% reported feeling fatigued or worried about being able to access sufficient food (96).

Some studies have examined the association between cooking skills and food insecurity among students. Gaines et al. (2014) found that food-insecure students are significantly less likely to report high cooking self-efficacy compared to food-secure students (25). However, Hughes et al. (2011) found that cooking skills had no association with food security status among students (21). The literature points to the need for more research to elucidate the role of cooking skills play in the food security of students.

2.2.3.1. Financial strain among post-secondary students

Despite the limited research on the implications of student food insecurity, there has been extensive research on student financial strain (119–121). Living with limited finances combined with borrowing money through student loans can place a high degree of financial strain on post-secondary students (13). Financial strain has been connected to stress and mental health among post-secondary students (60,119–122). Stallman et al. (2010) found that Australian students were far more likely to report psychological distress in comparison to the general population, and students reporting financial stress had double the odds of experiencing a mental illness compared with students reporting no financial stress (119). Similarly, Eisenberg (2007) discovered that students who reported struggling with finances were more likely to test positively for depression and anxiety disorders compared with students who reported a comfortable financial situation (120). Student loans have also been connected to reduced psychological functioning over time in the US. Walsemann et al. (2015) found that both yearly and cumulative student loans accrued during post-secondary studies contributed to lower psychological functioning in later adult life (121). Finally, a systematic review by Richardson et al. (2013) demonstrates that student debt has been associated with higher levels of stress and a higher likelihood of experiencing

poor mental health and depression (122). While this body of literature indicates that financial stress is a risk factor for poor mental health among students, there has been very little research to determine whether food insecurity has an impact on student health.

2.2.3.2 Theory of emerging adulthood

Food insecurity during post-secondary school may be particularly detrimental for the health of students due to the likelihood of experiencing this phenomenon in the late teenage years and the early 20s. The developmental period between the ages of 18 and 25 has been termed 'emerging adulthood' (123).

Arnett (2015) states that the emerging adulthood life stage is characterized by the exploration of identity, instability of employment, place of residence, and relationships, a focus on oneself, a feeling of being 'in-between', and optimism for the future (123). This period is one of growth, exploration, and transition, when emerging adults have unprecedented freedom to test out different life options (123). However, not all emerging adults have the same degree of freedom during this life stage. Arnett points out that many emerging adults struggle with the financial burden of post-secondary studies and emerging adults from poorer backgrounds may have a more difficult time obtaining the finances needed to pay for their university education (123). Emerging adulthood may explain why students within this age group are particularly vulnerable to experiencing long-term health and stress outcomes as a result of financial strain (119–121) and food insecurity (124,125). Although they did not investigate food insecurity, Walsemann et al. (2015) found that young adults who accrued high levels of student debt are more likely to experience psychological suffering between the ages of 25 and 30 (121). The impact of food insecurity during this time period may be exacerbated for emerging adults who experienced hunger in childhood. For example, Kirkpatrick et al. (2010) found that young adults were susceptible to poor health if they had experienced hunger during their formative years (125). Similarly, McIntyre et al. (2013) found that experiencing hunger in childhood raised the likelihood of experiencing depression or suicidal ideation between the

ages of 14 and 25 (124). While the mechanisms behind this phenomenon are unclear, emerging adults between the ages of 18 and 25 may be at increased risk for experiencing poor health outcomes as a consequence of food insecurity due to financial constraints.

2.2.4. Student Advocacy Efforts

The topic of student food insecurity has gained traction in the media and is becoming recognized as an important issue (112,113,126). Meal Exchange is a non-profit organization that works to support food banks and other aspects of food access on Canadian post-secondary campuses. Meal Exchange recently launched the 'Beyond the Campus Food Bank' initiative (127). This initiative aims to raise awareness of student poverty by supporting research projects on student food insecurity in Canada. Meal Exchange is currently conducting a study on the prevalence of student food insecurity at five Ontario universities, and has set the benchmark goal of reducing student food insecurity by 20% in the next five years (128). The advocacy efforts made by this group and by their network of students across the country is a grassroots attempt at addressing the root causes of food insecurity and applying political pressure to find long-term solutions.

2.3. University of Waterloo Context

The Region of Waterloo in Southern Ontario is home to three post-secondary institutions; Laurier University, Conestoga College, and the University of Waterloo. The University of Waterloo has over 35,000 part-time and full-time undergraduate and graduate students, including 4,900 international students (129,130). Due to the influx of students in the Waterloo Region and the demand for housing, the cost of living for students remains relatively high. Approximate estimates from the University of Waterloo and the OSAP aid estimation tool place the annual cost of living for an undergraduate student between \$17,000-21,000 per year, including tuition and rent (131–135). The cost of living plus tuition and other

school fees can place a huge degree of financial strain on University of Waterloo students and their families.

The University of Waterloo is also home to one of the largest post-secondary co-op programs in the world; approximately 60% of undergraduate students are enrolled in a co-op program (129,136). The co-op program allows students to graduate with two years of work experience and can potentially provide them with a source of income throughout their university years (129). Despite this, the University has had an on-campus food bank for over 20 years. In response to student demand for an on-campus emergency food program, the Feds Student Food Bank (hereafter referred to as the campus food bank) was first proposed in the fall of 1993 and was officially opened in September of 1994 (109). In 2013, the campus food bank distributed 3,165 pounds of food to students on 448 occasions (137). Recent trends demonstrate a higher demand for emergency food services among University of Waterloo students over time; the number of visits recorded at the Feds Student Food Bank during the winter 2016 semester was nearly double the amount seen during the same time period in 2015 (415 vs. 255 visits) (138,139). It is unclear why the number of visits increased, but these data may be indicative that food insecurity is a growing problem within the University of Waterloo student body. Overall, the University of Waterloo provides a unique setting and population of students with which to conduct research on food insecurity.

3. Study Rationale and Objectives

3.1. Research Gap

Although there is a dearth of research on post-secondary student food insecurity in Canada, recent prevalence estimates from universities in Nova Scotia and Saskatchewan indicate that it may be a widespread issue among Canadian student populations (26). Food insecurity during the emerging adulthood life stage may be particularly detrimental among this population and have long-term implications for health and wellbeing (123–125). Several risk factors for student food insecurity, strategies for trying to cope, and links between food insecurity and poor health have been observed among post-secondary students in the US and Australia (21,22,25,92). However, these analyses do not provide insight into students' lived experiences of food insecurity. Post-secondary students are a unique population, meaning that the experience of food insecurity among this group may differ from what has been found among other low-income populations. Gaining a better understanding of the student experience of food insecurity, and how this experience may differ from what we already know about food insecurity, is essential for designing interventions to effectively address this issue among the post-secondary student population.

Researchers have identified the need for qualitative research to examine how the outcomes of food insecurity interact among various populations and to reveal the realities of the food insecurity experience (43,62). In their investigation of food insecurity among African-American women, Chilton and Booth (2007) argued that qualitative investigation is required to “ground [...] inquiry in lived experience to understand the relationship between food insecurity and health in a way that matters to individuals” (52, p.117). Based on the findings of a qualitative study of student food bank users, Nugent (2011) argued that more research is needed to tease apart issues of student stress and health related to food insecurity in Canada (27). The gap in knowledge on the experience of food insecurity and its consequences are hindering policies and programs from best supporting health and success among food-insecure students.

Studying student experiences of food insecurity will provide insight on the barriers they encounter and ways improve food insecurity among post-secondary students. This research is especially needed within an Ontarian post-secondary context, as the financial factors in Ontario may put students at risk for food insecurity-related stress and health outcomes.

Lastly, the few Canadian qualitative studies that have been conducted on student food insecurity have gathered student participants solely from on-campus food banks (27,28,117). While these studies have provided some insight into the pathways that lead students to accessing food banks, this selective sampling has likely ignored the majority of food-insecure students who do not resort to food banks as a coping strategy (21,22). It is important to hear the experiences of a wider variety of students who experience food insecurity to gain a more comprehensive understanding of this phenomenon.

This mixed methods study was undertaken to explore the experiences of food insecurity among undergraduate students at the University of Waterloo.

3.2. Research Question and Objectives

RQ: What are the experiences of food insecurity among undergraduate post-secondary students at the University of Waterloo?

Objective 1: To identify how students who have encountered food insecurity in the past year understand and experience this phenomenon.

Objective 2: To examine perceived barriers to food security.

Objective 3: To explore strategies used to attempt to cope with food insecurity.

Objective 4: To explore whether coping strategies differ between users and non-users of the campus food bank.

Objective 5: To examine perceptions regarding the implications of food insecurity for health and well-being.

In addition, this project provided an opportunity to explore ideas for supporting food security among students who have struggled with food access.

3.3. Anticipated Impact

This exploratory study begins to address the gap in research on the lived experience of post-secondary student food insecurity, and therefore will help to provide a foundation for broader intra-university studies of food insecurity among post-secondary students. Through qualitative and quantitative inquiry, this research provides much-needed insights into students' experiences of food insecurity and the perceived implications. To the author's knowledge, this research project is the first in Canada to elucidate the experiences of food-insecure students who do not access a campus food bank, which will provide a more comprehensive understanding of the food insecurity experience among the post-secondary student population. This research could inform the content of broader quantitative surveys of student food insecurity on Canadian campuses and provide a starting point for discussions related to provincial and federal policies on student support.

4. Methods

4.1. Study Design Overview

This study used a convergent parallel mixed methods design, whereby quantitative and qualitative data were gathered from the same group of participants simultaneously (140). This approach was chosen because quantitative data allowed the research question and objectives to be answered more comprehensively than could be achieved with qualitative data alone. In particular, it was advantageous to compare students' qualitative perceptions of the experience of food insecurity with a reliable and valid food insecurity measurement tool (32). Data were gathered from student participants using two surveys and a semi-structured in-depth interview. The research paradigm; specifics of the sampling, recruitment and data collection approaches; and the analytic strategy are detailed below.

4.2. Research Paradigm

A constructivist epistemological perspective informs this research. The concept that individuals in everyday life actively construct social realities and meanings is a guiding principle of the constructivist approach (141). Constructivist researchers are interested not only in what is occurring, but how meanings are created and maintained through interactions and discourses among social actors (141–143). Central to constructivist inquiry is the idea that there is no objective reality or inherent truth (143,144). This means that each individual can have his or her own conflicting understandings of reality that can be simultaneously 'true', and that these understandings are shaped by various individual resources and constraints (143). Therefore, the researcher took care to listen to each student participants' own meanings and perspectives on the reality of the food insecurity experience. It is crucial that the constructivist researcher acknowledges her culture and worldview, without allowing this worldview to interfere with the meanings put forth by participants (143,144). As such, the researcher attempted to

acknowledge her beliefs and opinions but also suspend them in order to ‘hear’ the experiences of student participants who have experienced food insecurity. For example, some students spoke of certain barriers to food security that the researcher had not previously considered to be factors in food access, which required a suspension of her own beliefs and opinions.

4.2.1. Adaptive Theory and a Conceptual Model

In line with a constructivist perspective, Layder’s (1998) adaptive theory informed the study design and analysis (145). Layder (1998) argues that one cannot enter qualitative analysis with a completely ‘clean slate’ and the use of existing theoretical frameworks to guide social research can orient the researcher to concepts and interpretations that may not be apparent in a grounded theory approach (145). This dual process has been termed ‘adaptive theory’ (145). The basic tenet of adaptive theory is that conceptual frameworks provide lenses through which to view qualitative data so that the research findings can be applied to wider issues and concepts (140,146). Adaptive theory is thus as an attempt to “combine an emphasis on prior theoretical ideas and models which feed into and guide research while at the same time attending to the generation of theory from the ongoing analysis of data” (143, p.19). The rationale is to allow an interplay between existing theoretical frameworks and empirical data, so that prior frameworks provide a flexible ‘scaffold’ upon which new frameworks and understandings can be built (145). However, Mills and Bettis (2015) caution against the use of theory as a “straitjacket into which the data are stuffed and bound” (144, p.30). In this study, Alaimo’s (2005) conceptual model of food insecurity [Figure 1] was used to provide context for the interview guide and data analysis, but the meanings expressed by student participants have been allowed to emerge in an inductive manner (43). Although the framework was developed in the early 2000s, it is a useful framework for this study because it is one of the only frameworks that comprehensively outlines the stages of food insecurity, including risk factors, main features of the experience, coping strategies, and potential outcomes (43). This framework

was developed as a part of a panel commissioned by the USDA to review methods of national food insecurity measurement, and the concepts within this framework were the basis for the HFSSM, which is widely used in food insecurity research and surveillance in Canada and the U.S. (1,33,147). The concepts included in the model are a starting point to investigate the food insecurity among post-secondary students, as they comprehensively address the experience of food insecurity including outcomes and consequences, which are of importance in addressing the aims and objectives of this study. To the knowledge of the researcher, this study is novel in terms of exploring how this framework matches up with our understanding of food insecurity among the post-secondary student population.

4.4. Sampling and Recruitment

4.4.1 Sampling and Inclusion Criteria

A purposive sampling technique is often used in qualitative research to select participants who have particular characteristics that are of importance in fulfilling the research objectives (142).

Participants for this study were purposively sampled to fulfill the eligibility criteria.

Eligible participants were undergraduate students at the University of Waterloo who provided some indication of constrained food access over the past 12 months in response to a food security indicator included on a screening questionnaire (detailed below). This study focused on undergraduate students because they comprise the largest student population at the University of Waterloo and the majority of users of the student food bank. As well, unlike graduate students who are commonly provided with research or teaching positions to supplement their income throughout their degree, undergraduate students are often responsible for financing the majority of their tuition fees (137,139). No limitations were imposed in terms of whether students were enrolled in full- or part-time studies; while full-time students pay more tuition, part-time students have been found to visit campus food banks (111). In some cases, the decision to study part-time may have resulted from experiencing financial pressures while

trying to pay for university as a full-time student. Undergraduate students who lived on-campus in residence were excluded because they are required to have a meal plan (148). Students who lived with their parents or a guardian during university were also excluded, as a dependent within a household may experience food insecurity differently from students living alone or with student roommates. Students who had been enrolled in post-secondary studies for less than 12 months were excluded given interest in capturing student experiences of food insecurity. As well, the measure used to assess food insecurity (detailed below) pertains to the past 12 months. Students were required to be at least 18 years of age at the time of recruitment so that they could provide consent (149). Participants also needed to be able to complete the online screener, survey tools, and the interview in English.

A total of 15 students completed the study. Data from one participant who was determined to not meet the eligibility criteria were excluded (this participant indicated that she lived on-campus during the interview). Theoretical saturation, which occurs when concepts and themes have been sufficiently developed, there are no new categories emerging from the data, and when discernible relationships between categories can be found (140,150), was deemed to have occurred when 14 participants had been recruited and interviewed. At that time, recruitment was discontinued.

4.4.2. Recruitment Procedure

Potential participants were recruited using two techniques; active recruitment through the campus food bank, and passive recruitment through flyers posted on-campus [see appendix A]. The use of a combination of active and passive techniques has been found to improve the recruitment of participants for qualitative research (151). In addition, it was hypothesized that the majority of students struggling with food insecurity do not access the campus food bank (21,22), therefore, recruiting participants from both inside and outside of the student food bank was intended to result in a wider breadth and comprehension of student experiences of food insecurity. The general purpose of the study was

conveyed in a short information letter handed out at the campus food bank [see appendix B] and on the on-campus flyer. However, due to the sensitive and potentially stigmatizing nature of the topic of food insecurity, the study was described as an investigation of student food access (140,151). The information letter and the on-campus flyer indicated that participants would receive a \$20 grocery card as an honorarium for their participation.

The campus food bank is located in the Student Life Centre and is open 5-7 days per week. Student volunteers welcome visitors and record basic information about food bank visits in a visitor logbook. Student food bank volunteers can be considered gatekeepers to accessing a selective segment of the student population at risk for food insecurity, as they are involved in the daily operations of the food bank, and interact with student food bank visitors (140,151). The interaction between the student volunteers and the food bank visitors provided an opportunity for the transmission of information about this research study. Volunteers were instructed to provide each food bank visitor with a short information letter with a list of on and off-campus resources attached [See appendix B and C]. Food bank visitors were asked to visit the screening website listed on the letter and to contact the researcher with any questions.

Flyers are a common tool for participant recruitment for qualitative studies, and are frequently used in qualitative public health research (151). Flyers with a description of the study were posted in various locations throughout campus, including the Student Life Centre, Davis Centre and Dana Porter libraries, Environment and Science buildings, the Math and Computing Complex, Burt Mathews Hall, and on outdoor signboards [see appendix A].

Recruitment of participants began following approval from the Office of Research Ethics in the fall of 2015 and continued until spring 2016, at which time it was decided by the researcher and her advisor that theoretical saturation had been reached.

Table 2: HFSSM screener (USDA food sufficiency question)

<p>1. Which of these statements best describes the food eaten in your household in the last 12 months:</p> <p>[1] Enough of the kinds of food we want to eat [SKIP 1a and 1b] [2] Enough but not always the kinds of food we want [SKIP 1a; ask 1b] [3] Sometimes not enough to eat [Ask 1a; SKIP 1b] [4] Often not enough [Ask 1a; SKIP 1b] [] DK or Refused (SKIP 1a and 1b)</p> <p>1. a) [IF OPTION 3 OR 4 SELECTED, ASK] Here are some reasons why people don't always have enough to eat. For each one, please tell me if that is a reason why YOU don't always have enough to eat. [READ LIST. MARK ALL THAT APPLY.]</p> <p>[] Not enough money for food [] Not enough time for shopping or cooking [] Too hard to get to the store [] On a diet [] No working stove available [] Not able to cook or eat because of health problems</p> <p>1. b) [IF OPTION 2 SELECTED, ASK] Here are some reasons why people don't always have the quality or variety of food they want. For each one, please tell me if that is a reason why YOU don't always have the kinds of food you want to eat. [READ LIST. MARK ALL THAT APPLY.]</p> <p>[] Not enough money for food [] Kinds of food (I/we) want not available [] Not enough time for shopping or cooking [] Too hard to get to the store [] On a special diet</p>

4.4.3. Screening Procedure

Potential participants were invited to visit a website on the 'Hosted in Canada Surveys' web domain, which prompted them to complete a screening questionnaire [see appendix D]. The survey included questions to ascertain eligibility according to the inclusion criteria described above. The food sufficiency status of each potential participant over the past 12 months was assessed using the screening question from the Household Food Security Survey Measure (HFSSM) (40). This screening question is referred to in the literature as the 'USDA food sufficiency question', but will be referred to as the 'HFSSM screener' throughout this document. The HFSSM screener is included as an optional component at the beginning of the HFSSM and has been used extensively in USDA population health surveys since the

1970s, such as the Third National Health and Nutrition Examination Survey (NHANES-3) (40,152) The HFSSM screener is a single question that consists of three components; the first part of the question determines whether a household is food sufficient based on four possible responses [see Table 2], while the remaining two components provide additional information on the context of food insecurity within the household (40). While the HFSSM screener is not a comprehensive measure compared to the full 18-item HFSSM (i.e., it underestimates moderate hunger and overestimates severe hunger), it gives an indication of vulnerability and also has the advantage of low burden (152–154). Although the HFSSM screener provides information on food sufficiency related to food availability, it was important that participants in this study demonstrate financial insufficiency for purchasing food. Therefore, students had to indicate that they did ‘not have enough money for food’ to question 1a) or 1b) in order to be included in this study.

If the potential student participant fulfilled all of the inclusion criteria, the online survey displayed a webpage prompting him or her to provide contact information. The researcher sent an email thanking the potential participant for his or her interest and providing additional information about the interview and survey(s) along with a detailed information letter [see appendix E] and the consent form [see appendix F]. The researcher and the potential participant arranged an agreed-upon date and time to conduct the interview and administer the surveys.

In total, 128 people completed the online screening survey, and 52 people initially fulfilled all inclusion and exclusion criteria. However, after data from seven participants were analyzed, the inclusion criteria were narrowed to include only those who indicated they ‘sometimes’ or ‘often’ did not have enough food to eat in response to the USDA food sufficiency question, and also responded that they did not have enough money for food to question 1a) or 1b). This allowed the researcher to focus in on gathering the experiences of students with potentially more severe food access issues. After these changes were made, 31 people fulfilled all inclusion and exclusion criteria and were contacted via email

by the researcher. In total, 15 students responded and agreed to participate. Table 3 [see appendix G] displays participants' responses to the USDA food sufficiency screening question, which asked "This next question is about the food eaten in your household in the last 12 months, (since this month, last year) and whether you were able to afford the food you need. Which of these statements best describes the food eaten in your household in the last 12 months?" (155).

4.5. Data Collection

4.5.3. Data Collection Procedures

On the agreed-upon date, the researcher and the student participant met in a private space. The researcher greeted the student participant, and provided a copy of the detailed information letter, consent form, and list of on- and off-campus resources [see appendix B, C, D]. Once the student participant signed the consent form, the researcher provided the \$20 grocery card as remuneration. The researcher then administered the survey tools and interview [see appendix H, I]. The researcher followed the script for the semi-structured interview, remained attentive to each student participants' responses, and adjusted follow-up and probing questions accordingly. The interview was recorded using a handheld recording device along with a backup device in case of technological failure. The researcher asked the student participant for their permission to begin recording the interview and informed the student participant when they turned off the recording device at the culmination of the interview. The researcher took notes on her observations and thoughts throughout the interview. These notes were incorporated during the creation of codes and themes during the data analysis stage [see chapter 5 on data analysis and chapter 6 on reflexive journaling].

Following the administration of data collection tools, the researcher thanked the student participant for his or her time. The researcher then asked the participant if he or she was willing to participate in a member-checking procedure and provided the participant with the re-contact consent

form [see appendix J]. The researcher also asked the participant if he or she would like to be provided with a paper or electronic copy of the preliminary results via a feedback letter or a formal report with the complete research findings [see appendix K].

4.5.4. Data Collection Tools and Methods

Semi-Structured Interview

The primary method of data collection was a semi-structured, responsive interview. Semi-structured interviews are used in qualitative research to gain insight into the experiences of participants, and are intended to be flexible to allow participants the freedom to elaborate on their experiences through a set of informal questions (142,150,156). Questions in a semi-structured interview guide were focussed on the main objectives of the study, but were designed to allow a ‘free flow’ of information from the participant (157). The interview guide itself was informed by Alaimo’s (2005) conceptual model of food insecurity and by various qualitative studies conducted with food-insecure individuals [See appendix I] (11,27,62,65,158). The items included were intended to garner rich information from student participants and to adequately address the research aims and objectives.

The semi-structured interview began with an icebreaker question asking the participant about their favourite meal. This question has been used in semi-structured interviews with food-insecure adolescents and is designed to help the participant feel at ease and to build rapport between the researcher and the participant (65,151,159). The remainder of the interview consisted of primary and follow-up questions that addressed each of the research objectives. The interview guide also contained probes which were used to clarify wording, gather additional details, and keep the student participant on track with their responses (144).

Prior to data collection, the interview guide was piloted with an adult of similar age to the target population (not a University of Waterloo student) who had little to no prior knowledge of the research.

This was done to gather objective feedback on the structure and clarity of questions (140,142).

Recommendations from the pilot process were used to refine the final interview guide.

Responsive Interviewing

The researcher conducted the semi-structured interview using a responsive interviewing technique. This technique fits with the constructivist ontology of this study, as it emphasizes the relationship between the researcher and participant, the quest for a depth of comprehension, and flexibility of the interview design (144,157). The responsive interviewing technique views the researcher and the participant as individuals with different views, opinions, and experiences, all of which have an impact on the interview process (144). Although the researcher was not a neutral subject in this exchange, she endeavoured to be aware of her own beliefs, reactions, and biases during the interview. The researcher framed the questions in an open-ended manner to achieve depth within interviews and to allow the participant the freedom to answer from their own experiences. The responses of the participant guided subsequent questions during the interview to preserve individuality (144).

The researcher shared several early interview transcripts with a qualitative researcher (Dr. Samantha Meyer) at the mid-way point of data collection. Dr. Meyer provided feedback on interview style and probing and the researcher adjusted her interview technique accordingly, for example, by avoiding statements or questions that might be leading.

Demographic and Health Survey

The demographic and health survey was administered to each student participant in-person, immediately prior to the semi-structured interview. The survey [see appendix H] consisted of a series of items to provide the researcher with contextual information about each participant. Data collected included basic demographic information (age, year of study, gender, undergraduate program of study, and enrolment in a co-op program), means of financial support during the academic year, living situation

and costs during the academic year, and use of the campus food bank. In addition, a series of questions adopted from the 2011 Canadian Community Health Survey, mental health module (160) were included to query perceived physical and mental health and stress level. The participants' responses to the items on the demographic survey were used to inform probing questions during the interview.

HFSSM-Adult

After the interview, the researcher administered the adult items from the HFSSM (hereon referred to as HFSSM-Adult) to assess food security in the participant's household in the last 12 months and the last 30 days (40,161). The purpose was to determine how recently participants were vulnerable to food insecurity. The items were administered to the participant verbally, and responses were noted on a paper copy of the survey [see appendix L, M]. Coding developed by Health Canada was applied to classify each participant as living in a household with marginal food security, moderate food insecurity, or severe food insecurity (161). This information complemented the in-depth interview by providing insight into the severity and temporality of food insecurity each participant experienced. It should be noted that the HFSSM was added to the study protocol after some interviews had already been completed and the researcher was unable to successfully re-contact three participants for completion; thus, data from the HFSSM are available for 11 participants.

5. Data Analysis

Analysis of quantitative and qualitative data took place simultaneously. Analysis of interview data was undertaken using techniques from thematic analysis and adaptive theory (145,162,163). Main themes and core categories were identified through a combination of inductive and deductive analysis using provisional and satellite coding and the constant comparative process (145). All interview recordings were completely transcribed into a Word document. Analysis of interview transcripts took

place using NVivo qualitative data analysis software [see chapter 5.2. for details on quantitative data analysis].

5.1. Coding Process

5.1.1. First read-through of transcript and provisional coding

During the first read-through of each interview transcript, Layder's (1998) provisional coding was used to label segments of text. Layder (1998) defines provisional coding as "the search for new codes and concepts [that] goes on in tandem with the use of extant theoretical assumptions and relevancies" (143, p.55). Provisional coding is similar to 'open coding', which is used commonly in grounded theory. While traditional open coding is characterized by coding the data with no orienting theoretical concepts, provisional coding differs by acknowledging existing theoretical concepts while tagging and labeling segments of text (145). Provisional coding also differs from grounded theory, as it does not give way to more restrictive coding (e.g. axial coding) as data analysis progresses. Layder (1998) argues that each transcript should be provisionally coded while remaining completely open to new concepts, even as existing categories are being firmed up with new data (145). During provisional coding, segments of text were labeled according to emerging concepts that were similar to those in Alaimo's (2005) conceptual model of food insecurity (43). However, the researcher remained open to new ideas or concepts that fell outside of this framework, and tagged data to stay as true to the 'true meaning' of what the participant was saying (145). Similar to open codes, initial provisional codes are solidified and developed with the coding of each new transcript. This process ensured that emerging theoretical ideas and themes were not developed in isolation from existing frameworks within the literature.

Provisional codes were identified by segmenting sections of text based on the beginning and ending of ideas. That is, codes were assigned to pieces of text, and distinguished from one another whenever the participant deviated from the subject, expressed a new idea, or provided an explanation for

their responses. This resulted in some provisional codes being attached to relatively short segments of text, while others were assigned to larger paragraphs.

5.1.2. Satellite coding and constant comparative process

Satellite coding took place as codes were accumulated over the course of analysis. The satellite coding process identified common or 'main' codes that required further development (145). This process involved grouping common codes into categories to identify emerging patterns, and allowed the researcher to focus in on concepts that needed further refinement and investigation in future interviews. Through the process of satellite coding, the researcher revisited each transcript to reexamine initial codes, collapsed provisional codes into broader analytic categories, and began to draw relationships between categories and create coding hierarchies (163). As codes and categories became more refined with additional data, there was movement back and forth between the raw data, provisional codes, core categories, and broader themes (162,163).

The constant comparative process, and the use of framework matrices in Nvivo, allowed for comparison of experiences across different groups of people (i.e. international students vs. domestic students, visitors of the campus food bank vs. non-visitors of the campus food bank), and a comparison of participants' experiences based on food security status as ascertained by the HFSSM-Adult. A framework matrix was created for each major category and food security status of each participant, to compare participants' qualitative experiences with their responses on the quantitative survey. The process of collapsing categories together to discover broader themes did not take place until the majority of interviews had been conducted (at approximately interview 12) to ensure that no important details were lost early on in the coding process.

5.1.3. Codebook

Gibson and Brown (2009) explain that the goals of thematic analysis are to reveal consistencies, inconsistencies, and relationships within qualitative data (162). A codebook is often developed

throughout thematic analysis to achieve these goals, by categorizing ideas from the raw data to find commonalities and differences, and to define codes clearly (162). The codebook began with individual codes derived from the transcripts, and was developed to display broader categories through Layder's provisional and satellite coding (145,162). The codebook assisted with discerning relationships between categories and the development of broader themes. The codebook was created and refined in NVivo and transferred into a spreadsheet [see appendix AA; separate document]. The codebook contains categories and subcategories, code labels, a definition, and an example quote.

5.1.4. Unclear and Irrelevant Codes

Any data that had an unclear meaning were tagged and revisited after more interviews had been conducted to determine whether the meaning could be elicited. Similarly, the process of provisional coding resulted in a vast number of codes that were ultimately not relevant to address the research question and objectives. These codes were set-aside in a separate category.

5.1.5. Leading Text

The interview guide was extensively discussed with all three members of the advisory committee and a graduate student peer, and was piloted with an objective outsider. However, the process of interviewing was an active learning experience. As much as the researcher tried to engage in responsive interviewing without biasing the participants, there were a few instances in early interviews in which the researcher may have asked leading questions and prompted participants to respond in a certain way. During the provisional coding stage, these segments of text were coded normally but also tagged as 'leading text' (162). It was important for the researcher to acknowledge her role in the interview experience and in eliciting participants' responses, and interpret these instances with caution (162). The wording of probing questions in the interview guide was clarified and improved following these initial interviews.

5.2. Survey Analysis

Data from the demographic and health surveys and the HFSSM-Adult survey were compiled in an Excel spreadsheet. Frequencies for demographic information were calculated, and data from the HFSSM-Adult surveys were analyzed according to Health Canada coding guidelines (48). Health Canada considers 0-1 affirmative answers on the HFSSM-Adult to indicate food security or a single indication of challenges with financial access to food (referred to as marginal food security), 2-5 affirmative answers to indicate moderate food insecurity, and 6-10 affirmative answers to indicate severe food insecurity (48). The HFSSM-Adult also included two questions that asked how often the respondent compromised the amount of food they ate in the last 30 days (40). The quantitative data are not meant to be generalizable, but were gathered to complement qualitative findings and provide greater context for the qualitative interview data.

6. Ensuring Quality of Research

Erlanson et al. (1993) state that “trustworthiness is established [...] through the use of techniques that provide truth value through credibility, applicability through transferability, consistency through dependability, and neutrality through confirmability” (162, p.132). Therefore, a variety of techniques recommended by Lincoln and Guba (1985) and Silverman (2013) were used to ensure that the data gathered through this study are valid and reliable from a qualitative standpoint (142,164).

6.1. Reflexive Journaling

A reflexive journal allows a researcher record their thoughts and track the reasoning behind methodological changes during the data collection and analysis, and therefore contributes to the credibility, transferability, and dependability of a research project (164). The researcher wrote several journal entries throughout the course of the project [see appendix N]. The journal entries document changes to the interview guide, ethics modifications, and challenges with the coding process.

6.2. Peer Debriefing

Lincoln and Guba (1985) recommend that the researcher confer with a colleague who is not involved in the project to allow for an objective view of the research (164). The researcher participated in peer debriefing sessions with a fellow graduate student Alana Armas on two occasions during data collection and analysis. The researcher explained her progress and discussed challenges and successes with Alana during these sessions. Alana provided advice on coding methods, gave her opinion on emerging themes, and provided support. The researcher compiled a reflective report after each session that can be found in appendix O.

6.3. Inter-coder Agreement

Guest states “the reason for doing inter-coder agreement (ICA) checks [...] is to neutralize as best one can the biases any one individual brings to an analysis” (160, p.92). When 13 interviews had been conducted, the researcher asked fellow graduate student Alana Armas to code a section of an interview transcript. Alana independently coded two questions and answers from the interview guide with the help of a codebook, which listed the provisional codes, initial categories and subcategories, and definitions used in that section of text. The researcher and Alana met to compare each independently coded section of text, determine similarities and differences, discuss code and category structure and definitions, and come to agreement through Guest’s (2012) subjective assessment (162) [see appendix P for sections of coded text, codebook, and meeting notes]. Subjective assessment was a more appropriate method to use than a Kappa statistic due to the small sample size for this study (162). In addition, subjective assessment allowed for a discussion about the codes that corresponded to certain sections of text and the analytic interpretation of the text, as opposed to an overall level of statistical agreement. Finally, subjective assessment avoids challenges that arise when analysts use different computer programs to code pieces of transcript, which can result in segments of text being coded slightly differently (such as including or excluding a word in a tagged segment of text) (163). Gibbs argues, “it is rather arbitrary where the code

starts and finishes. More important is the concept or idea that lies behind the code” (163) (p.100). In this way, subjective assessment allowed the researcher to determine whether another person could find similar concepts within a section of text and verify the coding process.

Overall, the researcher and the peer coder had very similar coding structures and agreed on nearly all codes. The peer coder picked up on instances of participants’ feelings, which instigated a review of all transcripts to identify further examples. The peer coder also suggested that participants’ values and priorities be re-examined.

6.4. Memoing

During the data analysis process, the researcher engaged in memoing, which is a technique commonly used in grounded theory that was found to provide utility during thematic analysis (162). The researcher made notes about categories to facilitate satellite coding. By writing her thoughts about categories, the researcher was able to develop themes, draw relationships between categories, and make sense of the codes that fell within them. Memos for salient categories can be found in appendix Q.

6.5. Note-taking

The researcher took short notes during and after each interview. These notes allowed her to jot down thoughts and remember various aspects of the interview that could not be gathered from the audio recording; for example, participants’ body language. Notes for each interview can be found in appendix R.

6.6. Audit Trail

An audit trail is recommended by Lincoln and Guba (1985) to improve the ‘reliability’ of qualitative data (165). The purpose of the audit trail is to provide a systematic and detailed history of the research study and the steps that were taken to reach final results and conclusions (165). The audit trail can be found in appendices N, M, O, P, Q, and R. The audit trail includes the reflexive journal including

records of any alterations made to the demographic survey and interview guide, reports from peer-debriefing sessions and the meeting regarding inter-coder agreement, memos documenting the coding process, and notes taken during the interviews.

7. Results

7.1. Participant demographic characteristics, food security and health

This analysis draws on interview and survey data from 14 participants. Participants were assigned pseudonyms to protect confidentiality. Eight participants were female and six were male (Table 3). Participants ranged in age from 19 to 25 years of age, and were at various stages of their undergraduate degree at the time of the interview (ranging from year 2B to 4B). Half (n=7) were enrolled in a co-op program and three identified themselves as international students. All but one lived with roommates, and six shared household costs with these roommates. Seven students had accessed the campus food bank at least once. In terms of household food security status, one participant was categorized as living in a household with marginal food security at the level of adults over the past 12 months, six lived in households that had experienced moderate food insecurity, and four lived in households with severe food insecurity. Food security data were not available for the remaining three participants (who participated in the study prior to the addition of the HFSSM-Adult to the protocol), however interview data indicates the experience of some degree of food insecurity. Of the participants who completed the HFSSM-Adult, five reported that they had cut the size of their meals or skipped meals in the last 30 days; the number of days this occurred ranged from 2 to 12 days [Table 4].

Participants reported receiving financial support for university from a variety of sources (Figure 2). Nine students received financial help from their parents or earned money through a part-time job, and eight accessed their own personal savings. Six students received a government student loan. A minority of students had a line of credit and full-time employment.

Four participants reported their general health as 'fair' and 10 reported it as 'good' or 'very good' (Table 5, see appendix G). Nine reported their physical health as 'fair' or 'poor', while five reported it as 'good' or 'very good'. Three participants reported their mental health as 'fair' and 11 reported it as 'good' or 'very good'. Ten participants had trouble sleeping 'a little of the time' or 'sometimes', two reported

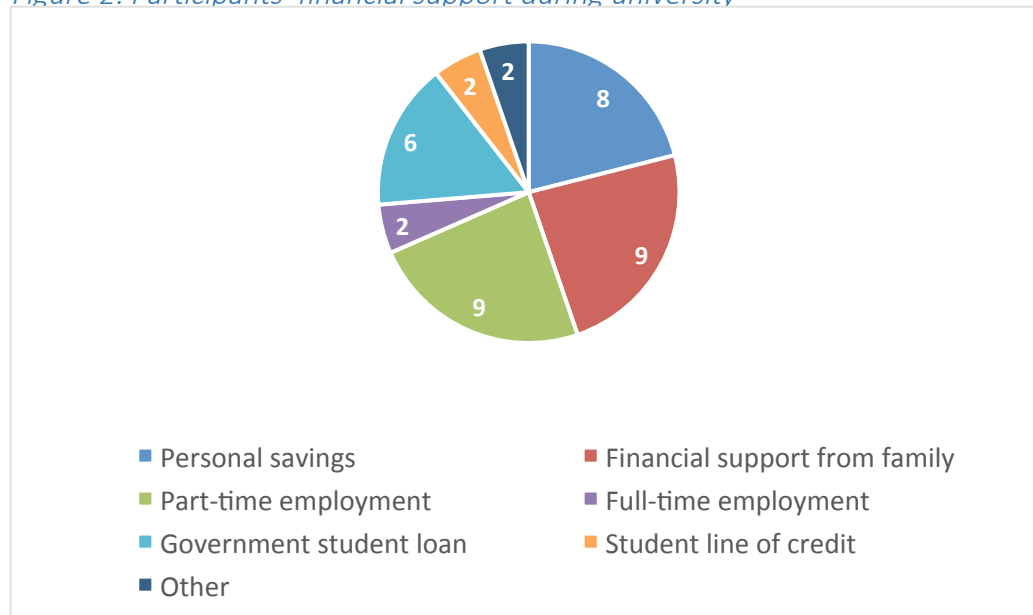
trouble sleeping ‘most of the time’, and two participants never had trouble sleeping. Only two participants reported that their average day was ‘not at all stressful’; the remainder said their average day was ‘a bit’ or ‘quite stressful’.

Table 4: Participants’ demographic characteristics

Re f #	Pseudony m	Gend er	Age	Year	Co- op	Internatio nal	Live with roommate s	Shared househol d costs	Feds Food Bank Visitor	Household Food Security Status ¹	Eat less or skip meal, days/month ¹
1	Myra	F	19	2A	Yes	No	Yes	No	No	/	/
2	Sophia	F	24	3B	Yes	No	Yes	Yes	No	1; marginal food security	/
3	Stuart	M	21	2A	No	No	Yes	No	No	2; moderate food insecurity	/
4	Emma	F	19	2A	No	Yes	Yes	Yes	Yes	/	/
5	Aaron	M	21	2B	No	Yes	Yes	Yes	No	/	/
6	Kelly	F	19	2A	Yes	No	Yes	Yes	No	3; moderate food insecurity	/
7	Riya	F	21	3B	Yes	No	Yes	No	No	5; moderate food insecurity	/
8	Kiara	F	25	4A	No	No	Yes	No	Yes	7; severe food insecurity	10
9	Alan	M	22	4B	Yes	No	Yes	No	Yes	3; moderate food insecurity	/
10	Aryan	M	19	2B	No	No	No	No	Yes	7; severe food insecurity	4
12	Vivian	F	21	3B	No	No	Yes	Yes	Yes	5; moderate food insecurity	2
13	Parth	M	20	2B	Yes	Yes	Yes	Yes	Yes	6; severe food insecurity	5
14	Isabel	F	20	3A	Yes	No	Yes	No	No	7; severe food insecurity	12
15	Liam	M	25	4B	No	No	Yes	No	Yes	2; moderate food insecurity	/

¹ Food security was assessed at the household level using the adult items from the HFSSM

Figure 2: Participants' financial support during university



7.2. The student experience of food insecurity

Categories and themes related to student food insecurity that emerged from the 14 in-depth interviews are organized under the following sections; students' understandings of food security, key elements of the student experience, factors that influence vulnerability, coping strategies, and health and academic implications. These sections have been arranged to address the research objectives, therefore, themes that are raised in one section may overlap with those from other sections.

7.2.1. Students' understandings of food security: "not going with an empty stomach"

When asked to describe what 'enough food' meant to them, students revealed various understandings and definitions of food security. Overall, students felt that their food security was related to accessing a certain amount or quantity of food. For example, some students felt that just having something in the fridge or having food to provide energy was sufficient. Many related their food security to adequate portion sizes or consistency of meals throughout the day; Kelly said *"having enough food would be eating some sort of breakfast and lunch and dinner"*. Similarly, Kiara felt that having enough

food would allow her to have not only meals each day, but enough food so that she could have a snack in between those meals.

Just as aspects of quantity were perceived to be important for food security, the quality of foods available was important for many students. For example, students felt that food security meant having access to healthy foods or being able to maintain a balanced diet. Food security also meant having the types of foods needed to cook a meal; Riya explained that enough food meant *“something that would be considered a meal [...] that could be anything from making fresh food to frozen food, but something along those lines”*. Some students felt that having enough food meant having more than low-cost and potentially less healthy foods, as Liam explained, *“if I have ramen, I’ll eat ramen. But if I have something else, I’ll usually try to eat something else until I end up with just ramen”*. A few students spoke about access to a variety of foods, preferred foods, tasty foods, and easy to prepare foods as being important to their food security.

Nonetheless, quantity was seen as the primary concern. Alan explained, *“after I can ensure myself to get fed, then I can consider the food choices I have”*. Some felt that the quality of food was less important and were more concerned with having something to eat rather than nothing; Liam stated *“I definitely prefer a bit higher quality food, but I don’t always really care”* and Emma said, *“quality [...] doesn’t matter”*. A key theme that emerged throughout the interviews was the complex nature of food security and the constant management that took place to ensure it. For these students, ensuring that they had something to eat often meant making trade-offs between quantity and quality of foods and concerns about whether food supplies would last. For example, it was important to ensure there would be food in the house for a certain period of time. Myra explained *“enough food will last me like, a week or so”* and Liam said that enough food meant, *“never having to think about it. Never having to think about having to go get food”*. Many students related food security to a lack of stress over their food access or having the ability to focus on things other than food. Food security was also related to an absence of

hunger or feeling satiated. Vivian explained that having enough food meant *“not going hungry at night before I sleep”* and Alan said, *“not going with an empty stomach”*.

7.2.2. Key elements of the student experience with food insecurity: “at this point in my life, I should have this figured out”

Several common elements emerged when students described their experiences with food insecurity. Students felt preoccupied about the food supply, experienced shortages during certain time periods, ate low-cost and unhealthy foods, and wanted to be independent and in control of their own money and food.

Preoccupation with the food supply

A nearly universal theme among students experiencing all levels of food insecurity was a preoccupation with their food supply. For example, students commonly worried or thought carefully about food purchases. Riya felt concerned about trying to purchase food with little money, and explained, *“you’re just like, ‘oh my god, I have this sort of amount of money, what’s the best place I can go?’”* Kelly said that money for food *“[is] something you’re thinking about”*. Sophia explained that food shopping *“require[s] planning, and everything, and like there’s a lot of reading that goes into making sure you get the best value for money”*. Alan explained:

You just start off with, ‘alright, I have almost no worry about money’, to the point where ‘okay, maybe I should think [...] before I spend’ [...] there are times where that mindset can slip [...] So you have to constantly remind yourself until you get accustomed to it.

Stuart had a tight budget for food, and had started memorizing the price of foods he wanted to buy so he could recognize sales. Some students were conflicted about purchasing food because it felt like a splurge or a luxury they couldn’t afford. Isabel explained *“I don’t wanna splurge on food [...] it feels like even just buying milk or something, I feel like it’s splurging for some reason? Cause it’s so expensive”* and Stuart

said that purchasing foods that were consistent with his culture felt like *“a luxury”* because these foods were usually imported and more expensive than ‘Western’ foods. Alan felt healthy foods were too expensive, and said, *“my priority now is spending less money on buying a lot of groceries [...] instead of just spending my money on health”*. Some were uncertain about where they would access food during times of shortages. For example, Alan explained that some of his strategies for accessing food, such as finding free food on campus, were *“not really stable”* and could not always be relied upon.

Food shortages

Consistent with the eligibility criteria, which endeavoured to capture the experiences of students who had struggled with food access, the experience of food shortages due to a lack of money to purchase food was a common experience. Students experiencing moderate and severe food insecurity had adapted during food shortages by compromising their food intake. For example, Isabel was having trouble gaining weight for a varsity sports team, and explained, *“I don’t think I’m eating enough, and it’s kind of due to the fact that I don’t have that much from my kitchen to make”*. Skipping meals due to a lack of food was also a common occurrence among students who had experienced moderate and severe food insecurity. Riya explained, *“as much as I hate to admit it, skipping meals tends to happen much more [...] without wanting to, you end up skipping meals and like, oh well, my body’s okay for now so I’ll just skip this meal”*. Kiara said *“I’ll just change my schedule so I’ll sleep in more. So I’ll miss some meals”* and Vivian said, *“sometimes I just go to sleep hungry”*. Conversely, the student experiencing marginal food security did not experience compromises in the amount of food they ate.

When money ran low, students made trade-offs when it came to purchasing food. Alan explained that he had *“cut down on things”* and Aaron *“basically had to penny-pinch”*, while Liam described it as a *“cash crunch”*. Kelly also explained, *“you’re running tight and it’s really easy to skimp on food”*. Several students explained that they were unable to cut down on other necessities such as rent but were able to

constrain their food purchases. Parth had experienced *“a deficit in terms of the budget and then that would end up in the food because that’s how it was”*. Liam accessed the campus food bank for food because he needed to use his money *“to pay rent”*. Similarly, Kiara explained, *“rent comes first”*. Stretching food to last during these times of shortages had become a common practice; Aaron said, *“I can stretch it, I can cope”*. Myra purchased fast food in large portion sizes because she could make it last for *“a lunch and a dinner sometimes”*. Emma bought *“this bag [of noodles for] three dollars [...], and it’s gonna hold for a few months”*. Liam had started to stockpile non-perishable foods that he accessed from the food bank in case of future shortages and explained that he was *“trying to conserve what [he had]”*.

Timing of shortages

Most students referred to the frequency of running out of money for food, which ranged from once, two to three times, every semester, and a few times per week over the course of their university careers. There were also specific times during the year when periods of food insecurity tended to occur. Several students explained that student loans are allocated at the beginning of the semester (September and January); therefore, food shortages coincided with running out of student loan money near the end of the semester. Alan and Liam were in their fourth year of undergrad, and financial support from student loans, co-op jobs, and parents had run out, meaning that financial access in their final year of their degree had become a challenge.

Eating poor quality foods

Although students did not always feel that the quality of food was important for their food security, students who had dealt with all levels of food insecurity ate foods perceived as being of poor quality during times of insecure food access. For students, poor quality referred to low-cost, energy-dense foods, frozen or canned foods, old or unsafe foods, and monotonous foods.

Many resorted to eating cheap and energy-dense or unhealthy foods during these times. For example, students mentioned eating chips, baked goods, pizza, and instant noodles due to the low cost of these products. Sophia talked about eating unhealthy food because it was *“much harder to get healthy food that is good for you”*. A common trend was students eating whatever would fill them up, regardless of health or nutrition. Alan said he was *“doing horribly”* when it came to eating healthy food because *“right now I’m focussed on not going empty”*. Aryan talked about purchasing bags of chips during times of food insecurity, because *“chips fill you up more”*. Similarly, Isabel talked about buying bagels from the Tim Horton’s on campus when she was running out of money for food, because they were *“on the cheaper end [and] sort of filling”* and avoided buying salads because *“it won’t really fill me up”*. Many students ate foods they did not prefer, such as non-perishable foods or frozen foods, because they cost less than foods they did prefer. Kelly explained that when money got tight, she ate the foods left in her pantry that she did not like, *“lentils. Legumes and stuff. Canned beans. They’re definitely not as tasty”*. Similarly, Alan said, *“I can cook whatever’s cheapest. I’ll grab it, I’ll make something out of it that I can tolerate eating”*. Eating old and unsafe, or monotonous foods was less common among students; Emma described stretching meat pie to last several weeks, and said *“it’s not fresh enough, but I can still eat”* while Isabel felt that the monotony of her diet was not helping her gain weight, and that a wider variety of food would *“help make the meals less repetitive”*. A few students had difficulty honouring food-related values such as buying local or sustainable foods, buying fruits and vegetables, and buying organic; Kelly was completing her undergraduate degree in environment, and explained that although she wanted to purchase local and organic foods, *“money becomes like the all-encompassing factor. What can I afford?”*. Parth had similar feelings about organic food, but explained *“organic vs. you still don’t have money for normal groceries”*.

Wanting to be independent

When students discussed their experiences with food insecurity, the theme of wanting greater financial control and independence emerged. Students experiencing all levels of food insecurity wanted to be self-sufficient and had attempted to manage their own finances, but had still run out of money for food. For example, Liam was in limbo between finishing his courses and graduation, and was trying to find a permanent job and steady source of income. He explained that throughout his fourth year, *“I did things to prepare myself for a situation like this”*, such as saving money, regularly paying off credit cards to save space for food purchases, and anticipating a tax reimbursement, but *“everything I set up failed”*. Students who received financial assistance from their families explained that they did not want to have to rely on this, and tried not to ask for help even when money ran low. Myra said, *“I don’t always wanna depend on [my parents]. Especially for like small things like food”*. Aaron felt similarly, and said, *“I could just ask [my parents] for more money you know but it’s uh, not something I wanna keep relying on all the time”*. Feeling guilty about relying on family for financial help was common. Myra explained *“I’ll let my parents know, they’ll come and give me money, or they’ll transfer money to my account but then I’ll feel so bad”* and Sophia said *“I feel very guilty cause I feel like I should, at this point in my life I should have this figured out”*. Isabel said, *“I feel bad if like I need my parents to like help me out as well”*. Isabel explained that her brother was attending university in a large Canadian city, and the cost of living there was higher compared to Waterloo. She said, *“[my parents] have so much going on with like supporting my brother [...] I’m trying to not burden [them]”* and *“I’m trying to be as independent as I can”*. Similar to Isabel, other students explained that they wanted to be self-sufficient when it came to finances. Stuart was reluctant to ask his parents for extra financial help, and said *“I don’t really earn a lot in order to cover my food, but I just try to use it wisely”*. Sophia said, *“I feel like I should be able to manage my own money and time”*, and Aaron said, *“if I can just manage this by myself, I’d rather do that than go asking for help every time I end up low on finances”*. Alan’s parents had helped out with money earlier in his degree but had

recently encountered their own financial struggles and he felt could no longer ask them for help. He explained *“I just have to manage it better”*.

7.2.3. Factors that influence vulnerability: **“there were instances where I did not have enough money to properly eat”**

Students discussed a variety of factors that contributed to their experiences of insecure food access. However, precarious finances emerged as a major underlying contributor to food insecurity, which was exacerbated by other factors such as food literacy, the food environment, time, and the student lifestyle.

Main factor: Precarious finances

Many students struggled with precarious financial situations, which ranged from a single precipitating event, or income shock, to the experience of several ‘risk’ factors at once or over time. Students experienced consistent money shortages and experienced income shocks. Students also struggled with financial independence, and the costs of living in Waterloo including purchasing food and paying rent. Students who were enrolled in co-op program and those who identified themselves as international students experienced unique financial difficulties.

Consistent monetary shortages often stemmed from insufficient OSAP installments or personal savings that ran out before the end of the semester. Kelly explained that OSAP estimates of the cost of living were inaccurate because *“this whole OSAP system is built on [the assumption that] your parents are going to help pay for school”*. Liam had a similar situation with OSAP throughout his undergraduate degree, and explained, *“just the way OSAP worked, I consistently never got enough”*. Aaron was an international student and did not receive OSAP, but described the experiences of a friend who was also a student, *“I know [...] that when it comes to situations like not getting OSAP in time, they can have a lot of issues with being able to pay their expenses”*. Due to these monetary shortages, students were

unprepared for sudden expenses, which were a major contributing factor to students' experiences of food insecurity. A common income shock occurred when student loan installments arrived late, which made it difficult to afford food. Sophia had felt stressed when *"OSAP [hadn't] come in"*. Students also experienced other types of income shocks. For example, Aaron had an unplanned medical expense that was not covered under health insurance, causing him financial distress, while Liam had experienced a loss of credit, a late tax reimbursement, and difficulty accessing social assistance between the end of his fourth-year courses and getting a full time job. Other income shocks included the death of a parent and the loss of a part-time job.

Although many craved financial independence and did not want to be a burden, students who were financially independent from their family found this to be a factor in their financial difficulties. For Kiara, financial independence was a result of estrangement from family members. Others explained that their families could not afford to provide them with financial support during their university careers. A few students financially supported their family members while they were in school, although this was not common. For these students, being financially responsible for others had created additional financial strain. For example, Parth and his sister were both international students in Canada. Parth explained:

We were kind of struggling in terms of finances [...] it got to the point, I being on co-op and she not being on co-op, I'd try to help her academic fees as well, so I did multiple co-ops. But again, all that money was going to fees which were really hefty, so [...] there were instances where I did not have enough money to properly eat.

The cost of living was another major financial barrier to food security. Students described the high cost of rental accommodation in Waterloo, high tuition fees, and rising food costs as contributing to their food access issues. For example, Stuart said *"food is taking so much money from my bank right now"* and Kiara said, *"the prices of things have increased as well [...] my grocery bill has yeah, been a lot more expensive"*, and Vivian said, *"it's not cheap to get groceries"*. Students found the high cost of healthy foods and the comparatively low cost of unhealthy foods as a barrier to food security, and suggested that they were more likely to purchase unhealthy foods than healthy foods because of the price difference. For example,

Isabel explained *“I’ll go on a grocery run today and end up coming home with just like bagels [...] but I didn’t end up getting any real food that I really want to get [...] veggies and stuff were just too expensive for me to buy”*. Myra described the difference in price and quantity of healthy and unhealthy foods at the grocery store, and said *“if you even buy one green pepper, it’ll be \$1-something, and then if you buy one chip bag it will be \$1-something”*. Similarly, Aryan said *“Doritos [...] they’re cheaper than like, mangos or like apples [...] per pound”*. Alan explained that due to the high cost of healthy food, he was *“relying on some form of less healthy food”*.

Half of the students were enrolled in a co-op program and for some, this played a unique role in their experience. Co-op students receive financial compensation for their work, but the other costs associated with co-op presented challenges and at times, may have outweighed the financial benefits. For example, co-op students are required to pay extra fees on top of the standard tuition fees. In addition, it is not always clear how much a student will be paid for their co-op placement when they are hired; as Sophia explained *“a lot of employers don’t like if we ask [about wages]. [You] ask about the money and things without making it look like you need that money”*. Sophia explained that cobbling together her income from co-op and student loans was not always sufficient, and explained that *“OSAP looks at your total income and lowers their loan”* and that it was uncertain whether her co-op job could *“cover rent for that term and food for that term and then tuition for next term”*. In other words, OSAP bases student loan amounts on predicted income. The uncertainty of remuneration and the need to relocate for co-op jobs made it challenging to anticipate future income; Alan was unable to obtain a student loan based on his reported income from co-op, even though he was unsure how much he would earn for his co-op position in the coming year.

Emma, Aaron, and Parth were international students and mentioned various problems with transferring money from their home country to Canada which made it difficult to ask their parents for extra financial help, struggles with navigating the Canadian banking system, and paying higher school fees.

Although he was considered a domestic student, Stuart had grown up in China and his parents still lived there. Stuart explained *“I don’t really ask for more money from my parents, because the procedure is really complicated”*. Emma indicated that financial issues are fairly common among other international students she knows, stating *“some difficult times for food or for other things, that’s really the norm of international students”*. Although she was a domestic student, Sophia had many friends who were international students, and was aware of their financial difficulties:

Sophia: I’m just really glad I’m not an international student

M: Oh really?

Sophia: Because that would...be much harder [...] you also don’t have the support system. If you don’t have food, your parents are in a different country, with the exchange rate in the middle, you’re less likely I think to want to be like, ‘hey, I need some money for food’

Other factors

Aside from factors that influenced financial resources for food, students noted a number of issues that shaped their access to both healthy and unhealthy foods and in some cases, may have compounded issues of food insecurity. These included food literacy, the on and off-campus food environment, time pressures, and the overall student lifestyle.

Food literacy

Students perceived factors indicative of limited food literacy skills as influencing healthy eating and independent living. Importantly, these limitations exacerbated food insecurity. Students experienced difficulty transitioning from living in their parents’ homes to living independently. Many had little experience with buying food and struggled with budgeting for food purchases. For example, Kelly’s parents had always taken care of grocery shopping when she lived at home, and shopping for her own food had *“definitely been a big learning curve”*. Vivian explained that she had difficulty in *“first year and second year [...] just the transition from living at home to living alone and having to suddenly do*

everything for yourself, cook for yourself". Similarly, Aryan explained "[budgeting] I've just learned, cause I'm 19 so I just took on the responsibility [...] last year I had my parents helping me out more than this year, so they kind of let the reins off a little bit this year so, it's a little different for me". Some had spent too much on money on food and had wasted food as a result; Stuart explained "if I buy too much food, like a lot of [it] will be wasted?" and Vivian said "when you buy groceries, you have to make sure you eat everything [...] otherwise it's a waste of money". Although many students had learned to cook and felt that cooking could be cost-effective, others expressed a lack of confidence in their cooking skills, particularly at the beginning of their university careers. Although he had recently taught himself to cook, Parth described his childhood experiences in the kitchen, stating, "I don't think I'd entered a kitchen ever, it was a thing mom does and we just get the food". Alan explained that his cooking skills limited the foods he was able to take from the campus food bank, saying, "some things I didn't take [...] 'cause I don't know what to do when them". Vivian enjoyed cooking and did not like to snack on 'junk' food, but thought that most students resorted to eating unhealthy, prepared foods because "it's 'cause it's easy, 'cause it's fast, they don't have the energy to cook or they don't really know how to cook". Although he was not confident in his cooking skills, Stuart recognized the importance of learning to cook and explained, "it's important, especially to a university student. Cause [in] my high school life [...] my parents cooked for me, but I'm living by myself or with some roommates, I have to cook by myself".

At times, such as the beginning of their university careers or the start of the year, students spent what they felt was too much money on non-essential items instead of food. Students had made trade-offs between food and wanting to fit into a perceived 'student lifestyle'. For example, Kelly said, "I think I'll definitely get better at it. I definitely spent more than I should have at the beginning of the semester on things like clothes or alcohol and stuff that you don't really need". She had begun to learn more about money management in the second term of her second year of university, and said "when you don't really think about what you're spending, you just sort of buy what you want, whereas when you're thinking

about money [...] when you're just thinking about how much you're spending, you focus more on what you need". Similarly, Riya explained that although she tried to budget her money, she might not have done so as effectively as she initially thought. For Riya, food insecurity occurred when *"you've budgeted or you've miscalculated [...] and things run out"*.

Food environment

Aspects of the food environment served to exacerbate food insecurity associated with financial insufficiency. These factors were experienced on the University of Waterloo campus and within the Waterloo community.

On-campus

Students described a plethora of processed and fast foods available on campus and noted the need for a wider variety of healthier, low-cost food options. When describing the types of food available on campus, Riya stated *"excessive sugar, excessive salt"* and Alan thought the options were either *"fast food or you know, semi-fast food"*. Aryan explained *"in terms of the campus [...] there's more a tendency for unhealthy foods to be promoted over healthier choices"*. In addition, the food on campus was usually too expensive for students to purchase. Vivian said, *"I don't really buy food on campus because it's expensive"*. The price of salads prevented Isabel from buying them, saying *"even though I would love to like eat it 'cause it looks delicious, it's too expensive"*. Sophia felt that initiatives to bring healthier food on campus, like the SLC farmer's market, were still out of her price range, and explained *"It's so expensive [...] there are posters about it everywhere going 'oh you know, you don't have to go off campus to buy healthy food', it's just \$1.50 per zucchini"*. When students needed to purchase food on campus, it ended up being cheap, energy-dense foods. Aaron explained that he could *"spend 5 dollars and have a coffee and a doughnut or something"*. Another issue raised, albeit less commonly, was the lack of organic food options and the limited healthy vegetarian options available on campus. Finally, Sophia described how

University of Waterloo catering services controlled the prices and availability of foods on campus, and made it difficult for cheaper food to be sold at events held by student groups, saying, *“they have very strict rules about what you can and cannot have”*.

Another issue raised by some students was the lack of space for meal preparation. Although there are microwaves in some facilities, there are no microwaves in major campus libraries, which both Myra and Sophia mentioned. Myra explained that this became a problem during midterms and exams when libraries are major location for studying. Although all participants were in their second year or higher, Alan mentioned the lack of kitchen space in many of the University of Waterloo residences. He described this experience as being a barrier to his food access in his first year of university, stating *“you can’t really cook anything yourself, because you don’t have a kitchen [...] I felt a little out of place because I couldn’t do that”*.

Off-campus

Barriers to food access within the Waterloo community included the location of food outlets. Major chain grocery stores with high-price points such as Zehr’s and Sobeys are easily accessible and close to student housing areas in uptown Waterloo, while discount grocery stores and farmer’s markets are located further away. Although grocery stores may be more difficult to access, there is a high degree of convenience and prepared food outlets near areas with high student housing density. Kelly described where she lived, saying *“it’s a really busy spot, so many students live there so we always sort of wonder why they don’t have a grocery store near us”* and *“If you [...] surveyed that [area] for prepared food and convenience food, I think you’d be shocked”*. Vivian also described the food environment near the university areas and said *“[the area near] the campus at Laurier, they have a lot of fast food, burritos, poutine. Fries, burgers [...] the food in the [university] plaza doesn’t tend to be too healthy”*. The ease of access to prepared fast foods resulted in the frequent purchase of food from these locations. Kelly stated

“I’m not going to trek all the way to the grocery store, I’m just going to go to the convenience store and buy a bag of noodles” while Riya explained: *“you’re limited to the places or the food areas offered around you [...] there’s an abundance of convenience stores”*.

The location of grocery and convenience stores was noted as a key factor in student food access due to the public transportation used by most students to purchase food. Public transportation was seen as a barrier by the majority of students due to the length of time it took to get to and from grocery outlets. Sophia explained that getting to Freshco, a discount grocery store in Kitchener, was *“a good 45 minutes there, 45 minutes back”*. Riya explained that longer bus rides to the grocery store meant it was more convenient to purchase unhealthy foods that were close by, *“it’s bad too, because [grocery stores] typically have cheaper food [...] when instead you could just fill your stomach with something close by. It just ends up being the poorer choices I guess”*. Emma only purchased fresh groceries once every two weeks, as getting to Walmart for cheaper groceries *“[is] harder, it takes longer”*. Vivian had similar difficulties, and said her grocery trip on the bus was *“easily 30 minutes to get to Walmart, and then maybe spend half an hour to 45 minutes getting the stuff you want for groceries, and then another half an hour to come back up, so it’s really time consuming”*. Carrying a sufficient amount of groceries on the bus was an additional challenge for many, a situation that was made worse during the winter months when snow and ice-covered sidewalks caused safety concerns. Kiara explained *“I can only carry so much and just have a backpack or a bag”* and *“it’s hard in the snow and ice”*.

A less common barrier was inadequate access to kitchen space and other cooking resources. Vivian had encountered difficulties with sharing a kitchen space with her roommates, while Kiara was lacking the cooking utensils she needed. She explained that *“kitchen utensils and that kind of stuff does get pricey as well, having to stock up on everything”*.

Finally, finding culturally appropriate foods in Waterloo had been a huge challenge. Eating culturally appropriate foods was important to some students, and many described going through lengths

to access them. Vivian described having to go back to her hometown to purchase her food, saying *“I have to go back [...] just to Japanese grocery markets or Korean supermarkets to get the grocery items I want”*. Stuart and Riya both described how much easier it was to access culturally appropriate foods in the greater Toronto area compared to Waterloo region. Aaron travelled by bus to find Halal meats in Kitchener, and explained, *“it can take about two hours at least”*. Although Alan and Vivian mentioned a new Asian food market in the University Plaza, Vivian explained that the price of cultural foods offered at this outlet were *“a lot higher than [in her hometown], so I never tend to shop there”*. However, the high price of imported cultural foods was not always a deterrent. As an international student with few friends in Waterloo, Emma took great comfort in being able to eat the foods she was familiar with. She explained that *“[Western foods] make me feel uncomfortable [...] I try to find some Chinese convenience store, where they sell some Chinese food so I can buy it here [...] it’s expensive because it comes from China, it’s imported [...] but I pay for it because I love it”*.

Time

Students understood the importance of eating a healthy diet and attempted to do so, despite the high costs associated with purchasing healthy foods. They knew that cooking for oneself and purchasing groceries could be healthier and more cost-effective than purchasing prepared foods. Students had specific values related to food, including being able to access culturally appropriate food, organic food, local or sustainable food, and vegetarian food. Aaron, Kelly, and Vivian tried to prep their meals ahead of time and Myra, Sophia, and Isabel packed their own lunches. However, despite their food-related priorities and intentions, a major theme was a perceived lack of time to devote to accessing food. Students made it clear that school was the top priority in their lives and worked hard to attend lectures, attain good grades, manage their coursework, and study for midterms and exams. Due to the prioritization of students’ time towards school, there was little time left over to devote to food; Riya

explained that food *“basically ends up being sacrificed over you know, other priorities”* while Myra said *“studying is important over food”*. Sophia struggled with balancing her time between school commitments and food, and said *“even if I want to stay at home and make food and then do things, it’s like well yes but, other stuff, school, co-op, everything”*. As noted above, the location of grocery stores and reliance on public transportation made shopping for food time consuming. Emma explained that taking the bus to Walmart for groceries took time away from studying during exam periods, *“when things get really busy I don’t have the time”*. Isabel had similar struggles with balancing her time between school, a varsity sport, and shopping for food, *“I have classes all the time and it’s just hard to fit it into my schedule”*. Students spent long days on campus and felt that they didn’t have the time required to cook their own meals; Vivian explained, *“sometimes cooking just takes too long”*. Some had difficulty scheduling time to eat around school responsibilities. Riya explained, *“honestly sometimes you have to make a conscious decision to schedule in time for sleeping, eating, taking a shower”*. This problem was exacerbated at certain periods during the school semester, specifically during midterms and exams and during the co-op application and interview process. One participant described students’ food habits during this time period, saying, *“how people are eating around major interview times [...] exams, and when co-op applications are going on? Bare minimum”*.

Eight students reported that they had financial support from a part-time job. However, there were challenges that came with committing time to a job on top of school priorities. Vivian said *“it’s hard to keep up with everything, especially if you have a part-time job on the side. Now I definitely don’t have as much time to prep my meals in advance”*. Myra had a part-time job but had hidden it from her parents because she felt they wouldn’t approve. She explained *“my parents never let me work because they’re like ‘your work is going to distract you in your studies’ [...] so I started working myself. Like my parents don’t know. But [...] I always need to, ‘cause I need money”*. Those who did have part-time jobs found that they needed to reduce their shifts during midterm and exam season in order to find the time to

study. Vivian explained that during the exam period, she would *“have to drop shifts and then that’s a loss of income for me”*. Similarly, Myra said that during exams, *“I’ll have [a] limited budget because I won’t be working”*. Some students were not prepared to sacrifice the time they needed to achieve good grades for a part-time job, even if a job would have alleviated some of their financial troubles. Aaron explained *“I was actually planning on getting [a part-time job] about two months ago, but the assignments just kept cropping up so I never really got the time to start looking”*. Similarly, Stuart said, *“I’m trying to find a part-time [job], but it already stresses my time so much”*.

The starving student lifestyle

Limited food literacy, the food environment, and inadequate time were seen as barriers to students’ food access. Each of these barriers contributed to the theme of the ‘starving student lifestyle’. Despite students’ concern over limited financial access to food, school-related stress, unhealthy eating, and time crunches were considered a normal part of the student lifestyle. For example, students recognized the importance of eating healthily for their physical and mental health and academic proficiency, but did not always feel as though they had the time or money to devote to healthy living due to school priorities, which was seen as a norm among students in general. As a result, students resorted to purchasing prepared foods that were more convenient than foods that required preparation. For example, Sophia discussed student stress and unhealthy eating. She said, *“students are already really stressed. I’ve gone to the [on-campus] library, and people are eating fries at like 9 in the morning”*. Sophia went on to explain:

It just makes me question what is going on? Why is this like, an okay meal to have? At 9 in the morning... it, it just defies logic sometimes cause like, students are eating whatever they can get to [...] with mental health there’s like a lot of taking care of yourself and just doing things, making the time for yourself, I don’t think students are doing that anyways. And then adding in food [access] issues. And physically, obviously

if you're eating really high in fat food all the time, or Tim Horton's all the time, that's not good, that's not healthy.

Kelly talked about her own eating habits when she got stressed around exam time, and how this behaviour conforms with what is seen as normal for students. She said: *"I have to stay alive to write these exams, hah. I don't know if that's a good way to think, but it is how a lot of people think this time of year [...] you get stressed out or something as big as school, 'cause like right now our whole life is school. You're a student, that is how you're defined"*. Kelly went on to explain, *"there's just sort of this idea that it's okay to eat junk food or food that isn't good for you? [...] the typical like freshman 15? And then like everyone's eating Kraft Dinner and Mr. Noodles. And so you kind of feel like it's okay?"*. Kiara had similar views of students eating habits, and said, *"I find that a lot of students just eat pizza and stuff"*. Stuart also talked about the student norm of having limited time and resorting to eating convenience food: *"Because of time, especially in academics, we are just going to like Burger King or fast food chain and after we finish in 10 minutes, we go back to work [...] it's a social norm I would say. Because we're all rushing for our time"*. However, while purchasing prepared food saved time, it was also expensive and exacerbated financial struggles; Alan said *"with the financial situation it might be difficult to get those fast foods because compared to what you can make yourself with the groceries [...] it can be more expensive"*. Myra knew it was cheaper to cook her own food, but struggled with finding the time, *"I'd rather save up money [...] I'd rather just cook it at home [...] than buy it. [...] I just won't have time to go home and make something"*. Sophia had grown frustrated with trying balancing her time and dealing with inadequate financial access to food:

Food costs are huge, the nutritional value of whatever we're having is not that great. Like why are we having this stuff? And it's not, [sigh] there's not enough time to do everything [...] it's frustrating because everyone keeps on saying oh, well when you have the time you can do it. Do you ever actually have the time?

Some students were aware of the toll this lifestyle could take on them. Kelly explained how it felt to eat poorly, *"you start a downward spiral right? Cause you're stressed out, and then you go eat this food, and*

then you run out of more money, and then you don't feel good cause you're eating bad food". Riya discussed students' food habits related to their physical health, "this is the period in your 20s when technically you're physically pretty well, I think that's why a lot of people tend to give up the quality aspect of [food]? And I think you tend to realize it later in life", and went on to connect students' eating habits, mental health, and academic outcomes, "mental health is a funny thing [...] it's to do with your marks as well, your marks will come in. Like, am I full enough that I can study and focus properly? Did I have the right types of food?"

7.2.4. Coping strategies: "I'm still thankful, I have a lot more than other people"

Students employed a wide variety of strategies to manage food shortages, and used many of these strategies at once or at different time points. These strategies did not differ based on the level of food insecurity experienced, and included attempts to manage finances, borrowing food or money for food, accessing emergency food programs, food sharing, accessing free meals, and normalization and resiliency.

The most common strategy described by students experiencing all levels of food insecurity involved the manipulation or management of money. Students applied for extra scholarships or bursaries, drew upon savings or government financial assistance, worked one or more part-time jobs, participated in studies for the honorariums, and altered their food budgets. In terms of budgeting for food, students reduced meat purchases, bought in bulk, used coupons, price-matched, shopped at discount grocery stores, and shopped on university student discount days.

Another common strategy was borrowing food or money for food from family or friends. Students who were able to ask their parents or other family members for financial help did so when they ran out of money for food. However, asking family for help was wrought with feelings of guilt over wanting to be independent. Moreover, not all students had the ability to ask their family for help. Some

families were struggling with their own financial situations, and were therefore limited in their ability to provide money; Alan said *“if I am in need of financial support, [my parents] are willing to provide. It’s just right now [my] family are kind of struggling with financial issues as well, so that’s really limited”*. Stuart had a similar situation, and explained, *“we are not rich, just saying, like we are not like the typical Chinese like, richest rich family [...] we have [a] limited budget”*. In some cases, students were able to borrow money from their friends or roommates in order to purchase food or cover other expenses. For example, Aaron had been able to rely on his friends during a period of food insecurity, and said, *“I basically spoke to my friends and they offered to cover my rent”*. In other cases, students visited home when money was tight, knowing that their parents would purchase groceries for them. Sophia explained that *“usually when I’m with [my parents], they get my groceries, they don’t let me pay”*.

Six student participants stated that they had accessed emergency food programs, specifically the Feds Student Food Bank [see chapter 7.2.4.1.]. Visiting other food banks in the community, such as the Salvation Army, was a less common strategy.

While some student participants were unable to share food with roommates due to dietary restrictions and preferences, many students had shared food among friends and roommates to manage during food shortages. Vivian described a deal she had made with a friend living in residence, where *“he would let me eat off his meal credits and I would make food for him”*. Riya and Aaron were dealing with food insecurity at the time of the interview, and said that food sharing had actually prevented food shortages in the past. Riya said *“I used to live with my friends and we always shared our food”* and Aaron explained *“when I first came here, the people I lived with had this whole grocery and cooking sharing thing [...] every person would cook once a week [...] sharing costs with 6 other people helped with keeping expenses down”*.

Finding free meals was a common practice for students. Students accessed free meals through part-time jobs or volunteer work, or at events or booths on campus. According to the students, free

meals on the University of Waterloo campus are easy to find. Kelly said, *“there’s no shortage of food around campus, you just gotta look for it”*. Sophia described a social media page where students can let others know where and when they could find free food, and had attended weekly events at the Aboriginal Centre for Education at St. Paul’s University College for a free meal. Stuart explained, *“I might go to some seminars because they do have free food”*. Students had a sense of humour about finding free food on campus; Kelly said *“it’s really funny because that’s how people reel students in. They say, there’s this event [...] and at the bottom of the poster it’ll say ‘free food!’, in all caps, bright red letters, and you’re like oh!”*. Similarly, Alan laughed when he said *“the free food and drinks are a fortunate by-product of going to a [guest] lecture”*.

While many strategies involved physical acquisition of food or money, coping with food insecurity involved a certain frame of mind. Some students, particularly men, ‘normalized’ or rationalized their food insecurity by viewing their situation as typical. For example, Stuart explained that he was used to a lower standard of living in his native country. He said *“we have different living standards compared to here [...] the minimum wage in Hong Kong right now is around 4 bucks”* and went on to explain *“it’s not the same thing as like the Western countries, like Canada, or like the states [...] when we deeply look at China today, like how they live, it’s something we’ve never heard of for sure”*. When comparing his experience growing up in China and living in Canada, Stuart said he *“consider[ed] [him]self kind of middle class”*. Others normalized their situation by reminding themselves that they were ‘better off’ than other less fortunate people. For example, Parth stated *“I’m still thankful, I have a lot more than other people”* while Liam compared his current financial struggles to how much more difficult it would be if he didn’t have a place to live *“looking for a job [while] living on the streets [...] I can’t even imagine having to deal with that”*. Some were reluctant to dwell on the consequences of food insecurity. For example, Parth explained that food access issues *“[are] a part of growing up”*. Despite experiencing moderate food insecurity and needing to access the campus food bank for food, Alan insisted that he *“[didn’t] feel any different”*.

Students also displayed resiliency in the face of their food access issues. When talking about issues with food access, some students felt they just needed to endure food insecurity and seemed to put up a brave front. Myra stated, *“I have to be strong and hold on”*. Similarly, Alan explained, *“I’m doing the best I can with the situation I have”*. Some felt that they simply needed to adapt to their financial circumstances; Aaron said *“[running out of money for food] wasn’t an insurmountable problem”* and *“it’s just something you get used to right?”*. Similarly, Alan said, *“taking on another lifestyle [...] It takes time to get used to it”*. Interestingly, some viewed food acquisition as a challenge or a chance to be creative. For example, Sophia explained that by using couponing as a coping strategy, *“I kind of game-ified the chore for myself [...] now it’s a fun thing I like to do”*. Despite food shortages, Isabel and Emma had found ways to put meals together using the food they had available to them. Isabel explained that she would *“kind of just try to be creative in making whatever is in my kitchen”*. Finally, many students remained resilient by distracting themselves with other priorities so they were unable to dwell on their financial situation. For example, Riya explained, *“you tend to shift your focus towards school instead of answering to your body that it’s hungry”*. Similarly, during periods of food insecurity, Aryan said *“you try to focus really hard on your academics”*. Kiara had been working multiple part-time jobs on top of full-time coursework to try to cope with her own financial insufficiency. She said *“everyone else was my priority, it was school, it was work, it was the extracurricular clubs, and it was my family [...] because I was so busy, I didn’t really think about eating”*.

Visitors and non-visitors of the Feds Student Food Bank

The strategies used to cope with food insecurity did not differ between users and non-users of the campus food bank; student participants had engaged in various coping strategies regardless of their food bank use. In addition, the level of food insecurity experienced did not determine whether a student

chose to access the campus food bank. However, those who accessed food from the campus food bank provided insight into these experiences, while those who did not explained their reasoning.

Seven students had accessed the campus food bank. Three had experienced moderate food insecurity, three had experienced severe food insecurity, and for the remaining student, food security as ascertained by the HFSSM was not available. These students described how the service operated and explained that the campus food bank was located in the Student Life Centre, provided mostly non-perishable food items, and was often open. Positive features included its helpfulness, discretion, inclusivity, and easy accessibility. A few students explained that the food bank helped them feel as though they were not alone; Emma said *“I think it is an okay place to go ‘cause I know that there are a lot of students that also need the food bank”* and Kiara said *“a lot of students can’t afford [food] cause school’s expensive, so [the campus food bank] is nice to have, I guess sort of like a support there for food and stuff”*. Criticisms of the campus food bank were a lack of cultural or vegetarian options, and low variety of foods. Alan and Liam often didn’t know how to cook the foods that they received from the food bank. Alan explained his low expectations of the food bank, *“it’s the food bank, I don’t expect much [...] you do have a limited choice”*. Kiara had used the food bank early in her degree, and had recently returned. She was displeased by the poor choices, *“they used to have more, they used to have pasta and rice, or maybe they just run out of it pretty quickly”*. Overall, despite feeling as though it was okay to visit the campus food bank, students only used it when it was absolutely necessary, demonstrating that students may have experienced a degree of tension or ambivalence over food bank use. Liam explained that accessing food from the campus food bank *“was always just to make ends meet”* and Emma said she accessed the service *“just when I need it”*. Vivian and Parth had experienced stigma when visiting the campus food bank. Vivian said, *“sometimes it’s really uncomfortable [...] it’s just really awkward”* and *“I don’t really want people to know. So like whenever I go to the food bank, I kind of make sure there’s nobody around*

and then I go in". Parth explained that the food bank volunteers are "trying to help but I'm also feeling inferior" and "I don't think I deserve that food".

Seven students had not accessed the campus food bank. Of these students, one had experienced marginal food security, three had experienced moderate food insecurity, one had experienced severe food insecurity, and two had missing data based on the HFSSM. Many were unsure of the location and operation of the service. For example, Riya said, *"is it accessible around the clock? [...] what do they have? Is it like, is it like a snack sort of thing?"* A few explained that the location of the campus food bank was not convenient for them. A minority were unaware it existed. Non-users had conflicting beliefs about the stigma of accessing emergency food programs. Sophia said *"I don't think there's any negative connotation if you need a service"* but when she explained why she chose not to visit the campus food bank, she said *"there's a difference in my mind between going to a free food event, where they're trying to get you to come? And ... just taking from the food bank"*. Similarly, Kelly said, *"I don't think it's like a stigma attached to [food bank use]"* but also said *"you never really want to admit that you need help"*. Conversely, Isabel directly acknowledged the stigmatization of food bank use: *"there's kind of a stigma attached to it, they say it's anonymous but I feel like it's kind of embarrassing to go there"*. In general, these students did not access the campus food bank because they didn't feel it was necessary. Kelly, Aaron, and Sophia explained that they had other options to fall back on, such as parents or friends, and therefore did not need the service. Aaron and Sophia also felt that they could manage their own money well enough that accessing the service was unnecessary. Students expressed strong feelings about abusing the service; students felt that the food bank was meant for someone less fortunate than himself or herself. For example, Kelly explained, *"I just didn't really consider myself someone that should be using that resource"* and said *"you don't want to take from someone else, who really doesn't have another choice. Who can't ask their parents, or who doesn't get OSAP or something. So you don't wanna be taking resources away from someone else"* yet later on in the interview, came to the realization that *"I guess*

within a school it's just for students that can't afford food. So now that I think about it, I could've gone".

Aaron felt similarly, despite having experienced food shortages. He said, *"I could've managed. It just doesn't feel right to be taking food from people who could really be in need"*. Stuart said that *"[the food bank is for] people that are suffering in a lower, like in worst circumstances [...] I wouldn't consider myself as those kind of people"*.

7.2.5. Health and academic implications of food insecurity: "I got so many things to do on my to-do list, and I still need to worry about my food"

Despite their attempts at coping with limited financial access to food, students felt that food insecurity had impacted various aspects of their health, wellbeing, and academic ability. Although the following sections are categorized under physical, mental, psychosocial, and academic impact categories, students often spoke about these experiences as being connected to one another.

Physical

Physical manifestations, including hunger and weakness or fatigue, were common outcomes of food insecurity among those experiencing moderate and severe food insecurity. Kiara explained that when she struggled with accessing enough food, she *"felt hungry"* and Isabel said *"I was just tired constantly"* and *"I just burnt out"*. Myra and Kiara had trouble sleeping during food-insecure periods. Myra explained, *"it'll be really hard going to sleep because of your empty stomach"*. Stuart, Emma, and Kiara had experienced poor physical health; Emma explained, *"my body health is not that good though, because I used to [not] have enough food during last semester, I think it caused some problems with my stomach"*. For some, food insecurity had impacted body weight. Aaron and Parth had lost weight as a result of food shortages. Aaron described, *"I've been slimming out over the past term. As far as I understand, and it's not because I've been dieting, but because I just haven't been eating"*. Parth said that food insecurity *"definitely took a toll on me [...] I've had comments like 'you've grown thinner', 'why do you look so unhealthy', stuff like that"*. Vivian had struggled to gain weight for her varsity sports team:

“last year I was like 110 but this year, when I measured it for the fitness test I was 103 and I was really shocked [...] I think I’m not eating as much as I should be”. However, Aryan had gained weight during a food shortage. He explained *“during December, I wasn’t exactly in a great financial position [...] I was putting on pounds, I should’ve eaten healthier but I didn’t have the monetary means to eat healthy foods”* and thought that this weight gain was a result of eating cheap, energy dense foods like chips.

Mental

Students universally described the toll that uncertain food access had on their mental health, including feeling stress or worry. Myra said that running out of money for food was *“nerve-wracking”*. Kiara had been dealing with a great deal of stress related to school and family relationships. Difficult accessing sufficient food in addition to these daily stresses made her feel as though she were experiencing a *“quarter-life crisis”*. Riya said *“it doesn’t feel that good. It’s just like an awkward situation and it’s a bad situation to be in”*. Emma thought food insecurity had been *“a really tough time”*. She described the impact of food insecurity *“like stress plus stress, it’s not only two it’s going to double or triple”* and *“I got so many things to do on my to-do list, and I still need to worry about my food”*. Aaron explained that food access issues had *“contributed to a lot of my stress and everything throughout the term”* on top of school-related stress. Similarly, Sophia said that financial insufficiency for purchasing food *“is just an added stress”* and Kelly said, *“it’s definitely an added stress”*. Aryan said food shortages *“felt kind of worrisome”*. Food insecurity also impacted students’ mood. Students felt irritated with their financial insufficiency and frustrated with structures that allowed the situation to occur in the first place. For example, Aaron described his frustration when customer service representatives at his insurance company were unhelpful after an unplanned medical expense jeopardized his food security. Stuart was exasperated when discussing tuition fees: *“how come [universities] keep rising the tuition every year? Especially in U or T or U Waterloo here. I don’t think it’s making sense and like, the school is collecting the money and they just keep building new buildings”*. When she spoke about her inability to purchase

healthy foods on campus due to the high prices, Sophia expressed exacerbation and said, *“I just wish this wasn’t an issue”*. Liam felt isolated and unsupported during periods of food insecurity, and explained it was *“mostly just frustrating, because I don’t know who to turn to”*.

Psychosocial

In addition to physical and mental health ramifications, food insecurity had psychosocial consequences for the majority of students. Students did not identify with being a ‘food-insecure’ person and actively normalized and rationalized the experience, but when confronted with the reality of their situation during the interview, some revealed that this disconnect had negatively impacted their self-esteem. For example, Parth said, *“I felt in a void a little bit because I didn’t have the money or the means to buy the foods that I like”*. He went on to explain that *“not having a really important part of my life easily accessible to me definitely kind of hurts”*. Kelly said, *“I come from a middle class family and it’s not something that you’re really used to saying, you know?”* Similarly, Alan said, *“it felt really weird [...] taking on another lifestyle”*. Regardless of the level of food insecurity experienced, students also felt stigmatized as a result of their food insecurity. Many said they felt guilty, uncomfortable or awkward, and embarrassed about their food insecurity. Myra said, *“it’s not comfortable at all”*. Kelly said, *“it’s sort of embarrassing”*. Sophia said, *“I feel very guilty cause I feel like at this point in my life I should have this figured out”* and *“there’s a lot of guilt with oh, I went to the movies, I needed a stress buster, I shouldn’t have done that”*.

Most students had also experienced social exclusion or isolation as a result of their food insecurity; particularly those experiencing moderate and severe food insecurity. A few students were unsure of how common their experience was. For example, Aaron said, *“I’m not sure how many people who are actually in a similar situation as me”*. Students often felt pressured to spend money with their friends in social settings, such as eating out at restaurants or going to bars. A few students said they had become less social during food-insecure periods because they couldn’t afford to participate in these types

of activities. Aryan had experienced food insecurity in December, and explained, *“it [took] a dent out of my social life cause I don’t have money [...] I didn’t really hang out as much as I did in September, and yeah it was kind of lonely”*. Riya described how it felt when her friends wanted to go out to eat:

If you’re with other people and [...] you make group decision to go somewhere, it’s just like that awkward situation where you’re like oh, like what should I say? Like should I tell them? [...] Typically we just tend to keep it to yourself, and be like okay I’ll just go with them, I’m not hungry, or something like that.

Similarly, Kelly talked about grocery shopping with her friends: *“you’re going grocery shopping and only buy a little bit and they’re like ‘why don’t you get more? What aren’t you getting? Why don’t you get this?’ It’s like well, I can’t afford it [...] so I think there’s definitely some stigma or embarrassment attached to that”*. Some students had experienced isolation because they felt that they could not share their financial situation with family or friends. Parth’s father had recently passed away and he did not want to concern his mother, who lived in another country, with his financial difficulties:

There were instances where I did not have enough money to properly eat the amount that I used to eat kind of thing. So it was definitely tough, it was a new experience, I’ve never had that experience in my life. Um, especially ‘cause you can’t even tell that to your mom because your mom would be stressing. She’s alone there, my dad’s not there [...] I don’t want to stress her out.

Liam did not want to talk about his financial situation with anyone, and explained his fear of being judged or blamed for his situation: *“It sounds like if I ask for help and I say these things, I feel like people will look and say, ‘yeah that doesn’t make any sense, like why would you not do your taxes, why would you save money by paying off a credit card?’”*

Academic

Students, especially those experiencing severe food insecurity and those without HFSSM-Adult data, drew connections between their academic performance and having poor access to food. Food insecurity impacted student’s ability to focus, study, complete assignments, and write exams. After talking about

purchasing cheap, energy-dense foods, Emma explained *“I need energy for my final project. So I can make sure the grade is not so bad”* and explained that being unable to access enough food results in *“you can’t concentrate on one thing, and you can’t focus on one thing”*. Myra said, *“sometimes I’ll tend to take [money] out from [my savings], just so I can eat. And I’ll focus. Because if I eat something, then I’ll be able to feel full, I’ll be able to study”*. Parth explained that running out of money for food *“definitely hinders your full attention towards any particular thing that you’re doing”*. Aaron said, *“it can be pretty difficult to work when you don’t have you know, proper food”*. Aryan spoke broadly about food access issues among university students:

Aryan: If you had less food then you’d be worried about food more than you’d be worried about your education. So I guess the whole mindset is, if you have enough money to eat food, you’d be able to study more effectively.

M: Okay. So what makes you say that?

Aryan: Because like, think about it, if you don’t have a good budget, like a lot of my friends have a lot harder time at the end of the semester [...] December, April rolls around, they’re eating Mr. Noodles ‘cause they ran out of all their money. So obviously that has a great effect on their school, or overall academic performance cause [...] you can’t starve yourself through school.

Although he said this situation occurred among his friends, Aryan went on to explain that he had experienced a similar situation at the end of the previous semester during exams, when he had resorted to eating cheap and unhealthy foods because he ran out of money. A few students had struggled to the point where they reduced their schooling to part-time or had dropped out of school altogether. At the time of his interview, Aaron was planning on reducing his course-load in the following semester to have more time to work and make money. Kiara had taken time away from school to work and had recently returned to finish her degree. She explained that she had left the University of Waterloo because *“I just felt school was just getting ridiculously expensive”*.

7.2.6. Comparison with Alaimo's (2005) conceptual model of food insecurity

A comparison of the findings from this study with Alaimo's conceptual model of food insecurity was included in the analytic plan. Alaimo's model provides an overview of the food-insecure experience, including risk factors, core components, coping strategies, and outcomes, and therefore provided a useful lens through which to view food insecurity among a student population. Overall, when comparing student experiences with the concepts outlined by Alaimo (2005), student food insecurity is similar to that among low-income mothers and other populations (43). However, some key differences arise, particularly with respect to risk factors, the temporal pattern of food shortages, the utility of coping strategies, health and other outcomes, and the household unit.

While access to education may be a risk factor for food insecurity among other populations (39), the student population is actively working towards achieving the education needed to gain job and income security and theoretically prevent future food insecurity. Sufficient time to access and prepare food is a risk factor in Alaimo's model and is also a factor for students, but is more related to their capacity to eat healthily. In addition, Alaimo's model does not discuss temporal patterns of food insecurity, yet the time of year when students experienced food insecurity followed a particular pattern based on academic semesters.

Another issue lies in Alaimo's assertion that the efficacy of coping strategies could result in 'resolution' of food insecurity; in other words, the use of coping strategies will help a food-insecure individual or household move into a food-secure state. Since the development of this model, there has been a significant amount of research indicating that skills- and community food-based coping strategies do not necessarily help food-insecure households become food secure (90,91). There was no indication from the students in this study that their coping strategies, particularly accessing free meals and food from the campus food bank, helped them reach food security. The bulk of research in this area suggests

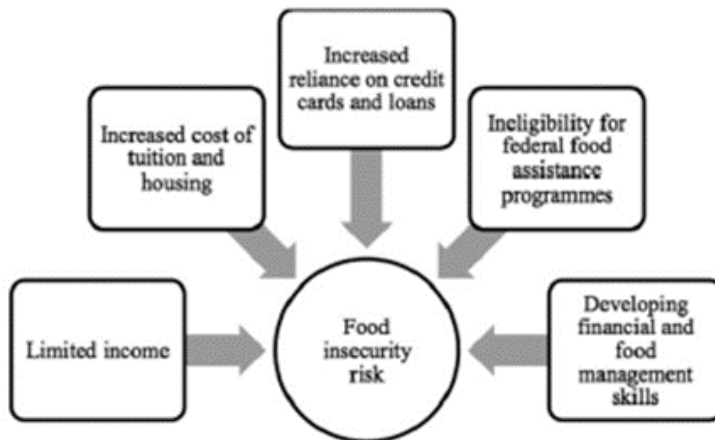
that sufficient finances are the only route through which Canadians struggling with food insecurity can achieve stable food security (51,166,167).

Another difference arises in the outcomes of food insecurity. Alaimo's model displays potential outcomes and consequences as fragmented and separate from one another. However, the findings from this study indicate that the various implications of student food insecurity are intertwined and difficult to separate. For example, when students spoke about experiencing stress and worry about their food supply, they connected these feelings to mental, physical, psychosocial, and academic consequences.

In addition, Alaimo's model is designed to encompass the experience of food insecurity at a household level. The students in this sample either lived alone or with student roommates, which means that their living arrangements do not fit into the mold of a traditional household; for example, it is unclear whether food insecurity within the non-traditional student household resulted in the outcome of distorted household dynamics. None of the students in this study were parents, therefore there were no instances of adults compromising their own food intake to feed their children.

Gaines et al. (2014) modified the risk factors in Alaimo's (2005) framework for a post-secondary student context, using data from a study conducted at a university in the southeastern U.S. (25)[see figure 3]. Gaines et al. (2014) noted that an insufficient income, rising tuition fees and rent prices, dependence on money from loans or lines of credit, and food and finance skills may contribute to student vulnerability, all of which were themes within this study (25). However, ineligibility for federal food assistance programs was not a barrier for students in this study as federal food assistance is not available in Canada. Students are ineligible for certain social assistance programs, such as Ontario Works, and must apply for financial help through avenues like OSAP. Despite some country-level differences, Gaines's (2014) model demonstrates the utility of modifying existing frameworks to better fit the experiences of post-secondary students.

Figure 3: Gaines et al. (2014) risk factors for student food insecurity, adapted from Alaimo (2005) ¹



[1] Gaines A, Robb CA, Knol LL, et al. Examining the role of financial factors, resources and skills in predicting food security status among college students. *Int J Consum Stud* 2014;38:374–84.

7.2.7. Strategies to address student food insecurity: “ask the students what they want [...] listen to their needs”

In order to gain insight into the things students felt were important to improve student food security, students had the opportunity during the interview to provide their ideas and opinions on strategies to reduce student food insecurity and promote adequate food access. Potential solutions and improvements to existing initiatives were related to addressing root financial causes of food insecurity and the promotion of a healthy lifestyle and capacity building. These strategies were proposed to take place at a student level, at a university level, at a government or policy level, and across all levels of influence.

Potential solutions and existing initiatives

Addressing the root causes of food insecurity

At a university-level, Emma suggested providing additional financial aid for international students, to facilitate the purchase of cultural foods: “*get some more scholarship for the international students, especially for University of Waterloo [...] some food support, for the international students, because we have different cultures, our food type is a little bit different*”. Sophia also suggested changes to the on-campus meal plan system to be more affordable, while Liam suggested providing a food voucher for

students to use when purchasing food on-campus. A few students were aware of student advocacy groups on campus that push for changes to tuition and other student fees (e.g. Ontario Undergraduate Student Alliance), and suggested these groups could work towards improving students' financial access to food. Lastly, despite the various barriers presented by co-op, students who were enrolled in the co-op program talked about the benefits of having a regular income throughout university. Alan said, *"when I was still doing co-op, I did get a fairly steady amount of income to support my meals"*.

Several students suggested subsidization could be a government-led strategy to address food insecurity. Students suggested that governments could lower the cost of food for students through a policy on food subsidies or increasing subsidization of rent and tuition. Kelly suggested something *"like a tax credit when you donate and stuff? But if there's a way to implement that for students to get sort of a cut on buying food"*. Kiara also said, *"subsidize schools [...] cheaper housing [...] I guess having sort of the other areas covered? In terms of reducing the cost of that, we'd have more money for food"*.

A common thread throughout these conversations was the need for greater awareness of students' financial difficulties across all levels of influence. Riya stated that it was comforting when other students discussed their own financial struggles, saying *"it's nice to sort of see people who bring it up [...] that sort of puts you on an easier level as well, it puts you on ease if you're in the same situation"*. Students wanted the university to play a more active role in student's access to food. Stuart said that food is *"a part of student life in university"* and explained that the university should *"ask the students what they want [...] listen to their needs"* while Sophia thought that if the university were to address healthy and affordable food access on the Waterloo campus, it could *"lead to a lot of change"*. Another commonality was the need for recognition of the financial 'root cause' of food access issues among students. Aryan explained that *"money, that's the most important thing when it comes to food access"* while Parth stated, *"understanding the root cause [...] I think that could be helpful"*.

However, some students were unsure of ways to improve food security among students. They recognized that the issue is challenging, and that multi-level solutions are needed. For example, when talking about reducing the cost of healthy foods on campus, Vivian said *“it’s a really difficult problem to solve, because the school itself makes a lot of money selling food, and that’s income the university generates and they don’t necessarily want to lose that income”*. She felt it was the government’s responsibility to improve students’ financial access to food, and explained, *“I don’t think the university will do very much than provide the food bank”*. Conversely, Liam did not think the government should be involved in food access issues, and questioned *“what government? Would it be Ontario? Would it be the federal government?”* Alan had similar feelings about governmental control over food access, and was wary of recent changes to Ontario tuition grants, saying *“tuition being lower, the student loans will probably be lower as well [...] in that sense it doesn’t really change anything”*. Alan said:

One government can’t really influence the economy that much, because we have a global economy right now. So maybe cut down on tuition, but that might or might not have an effect on food access. It might make us have more money, but whether we spend more money on food or not depends on the individuals [...] I would probably spend it on food, just saying.

Promoting a healthy lifestyle and capacity building

At a student level, Isabel suggested that the creation of a student food ‘swap’ system or hub may create opportunities for students to share unused food, trade for needed food, and have the added benefit of reducing food waste. At the university level, many students wanted access to more affordable, healthy, and culturally-appropriate foods on campus. Although Students recognized that the SLC farmer’s market, the St. Paul’s community garden, and St. Paul’s university college cafeteria were all initiatives that attempted to bring local, healthy, affordable, and culturally-appropriate foods to the University of Waterloo campus, they felt as though these services could be improved upon. For example, Aaron wanted increased access to affordable healthy food on campus, and said *“make it available generally”* to all students, although he was unsure of what that might look like. Student suggestions included lowering

the price of food sold by the farmer's market and extending the period of operation further into the fall term. Similarly, Stuart argued for *"bringing food from grocery [stores] and just doing a wholesale [market] here on campus"*. Riya described the lack of fresh fruits and vegetables in many campus eateries, and said *"the quality of food, the time it's available, and the price, those three things, I think definitely, definitely need to change"* and Aryan wanted food services to *"expand the choices to include healthier options"*. Sophia was aware of the Food Services Food Advisory Board (FAB), a group comprised of Food Services workers and students who evaluate Food Services and make recommendations, and was aware that it was one avenue through which students could influence the food available on campus. However, she recommended that the FAB find a way to be open to more students and have more flexible meeting times. Sophia also argued that there should be increased access to on-campus cooking facilities for students who do not have access to a kitchen: *"that's a very restrictive thing to begin with because students aren't learning how to cook"*. Several students felt that the variety of foods provided at the campus food bank could be expanded beyond non-perishables to include healthier, fresh choices. Collaborations with St. Paul's community garden or local grocery stores to provide fruits and vegetables were suggested as potential initiatives. Kiara suggested *"tak(ing) discarded food or the food that food services are gonna throw away but they're still good quality"* and providing a free meal for students in the Student Life Centre. The university runs a grocery shuttle service that picks students up at residence buildings and brings them to a local grocery store. Isabel suggested that a more clearly articulated schedule (e.g. what time the shuttle picks up and drops off) would make her more inclined to use the service to get her groceries and facilitate her capacity to get fresh foods.

It was suggested that the university should improve communication and advertisement of the campus food bank to students, as well as other resources such as counselling services. Students had ambivalent feelings regarding the use of the campus food bank; those who used it felt it was a helpful service yet only accessed it when it was absolutely necessary, and those who had not used it were either

unaware the food bank existed and unsure of how the service works, or felt it was not necessary. Myra explained *“I didn’t know about [the campus food bank], I’m pretty sure more people don’t know about it”* and Kelly said *“a big thing would probably be the like, informing people [...] if there are resources on campus, like the food bank, I knew about it but I haven’t gone to it you know? So telling people where to go”*. Isabel said that she would be more likely to use the campus food bank if she understood the service and how it operates, stating *“I don’t really wanna venture in there unless I know what to expect”*. Parth thought that advertising counselling services at the Feds Student Food Bank might encourage students who are struggling to seek emotional support, saying, *“a lot of people are still going through a lot of things. They might not have enough food, they might even not approach anyone”*.

Education and skills training was suggested as a way to improve student’s abilities to cope with financial insufficiency. It was also suggested that the university provide workshops to teach effective time management, financial budgeting skills, and basic nutrition education. Kelly explained *“maybe teaching people how to budget, especially second year”* would be helpful. Similarly, Alan suggested, *“we need a program telling you how to save money. Or how to manage our money. Something like that. Just go right, if this happens, what [...] we should do, what other options are there for you, you know when you’re having a hard time getting other money or food”*.

7.3. Summary

Overall, the experience of food insecurity among students is a complicated and complex phenomenon. Survey data demonstrated that students experienced varying levels of food insecurity throughout their time as undergraduate students. In relation to objective one, students conceptualized their food security to include aspects of quantity and quality, although simply having enough to eat was a primary concern. Common elements of the food-insecure student experience

included a preoccupation with the food supply, timing of food shortages, compromises in the amount and quality of foods eaten, and a desire to be independent.

With respect to objective two, students perceived inadequate and precarious finances to be a primary barrier to food security. Student also discussed barriers related to food literacy, the food environment, and time. The prioritization of school, time pressures, and the perceived commonality of being unable to afford adequate healthy foods intertwined to reveal the internalized norm of the starving student 'lifestyle'.

As for objective three, students dealt with food insecurity by managing existing financial resources or finding new opportunities to earn money, by sharing food or borrowing money from friends or family, accessing free meals, and visiting food banks. Students also coped by viewing their situation as normal and tried to be resilient.

In terms of objective four, coping strategies did not differ between users and non-users of the campus food bank and did not differ based on the level of food insecurity experienced. Yet, both users and non-users were ambivalent about accessing the food bank and had competing views of the stigmatization of emergency food programs. Users only accessed the campus food bank when it was absolutely necessary, while non-users were vehemently against the abuse of the service and explained that they did not feel like the 'type' of person who should be accessing a food bank.

In response to objective five, despite a lack of identification with being 'less fortunate', students described physical implications such as fatigue, mental implications such as added stress, and psychosocial implications like stigma, guilt, and social isolation and exclusion. These implications culminated in negative implications for academic potential.

When compared with Alaimo's (2005) conceptual model of food insecurity, the experience of student food insecurity was similar, yet different from other low-income populations with respect to risk factors, main elements, coping strategies, and perceived implications. Finally, students provided

various strategies to address food insecurity and healthy eating among students at the university and government levels.

8. Discussion

Though limited, the existing evidence suggests that food insecurity, a serious public health concern, may be deleteriously impacting Canadian post-secondary students (26,106,168). Food insecurity is estimated to impact between 26-38% of post-secondary students at universities in Nova Scotia and Saskatchewan, and studies from the U.S. and Australia suggest that food insecurity may have a negative impact on students' health and academic success (21,24,26). Although the rate of student food insecurity at the University of Waterloo is not known, the campus food bank provided over 4600 lbs. of food to visitors on 785 occasions during the fall 2015 and winter 2016 semesters (139,169). Estimates suggest there were nearly double the number of visits to the campus food bank in winter 2016 compared to winter 2015 (415 vs. 255), potentially pointing to a worsening problem although the cause for this increase is unclear (139,169). Co-op students comprised 43% of visitors to the food bank in fall 2015 and winter 2016, and international students comprised 16% of visitors in winter 2016 (data missing for fall 2015) (139,169).

The findings of this exploratory, mixed methods study add to the limited literature on the problem of food insecurity among post-secondary students in Canada; a potentially vulnerable, understudied population. Analyses of interview and survey data revealed that students experience elements of food insecurity similar to, yet unique from, other low-income populations, as elaborated upon below. Students experienced both qualitative and quantitative food compromises, yet desired as much self-sufficiency and financial independence as possible. They used various coping strategies to manage financial and other barriers to food security, yet nonetheless perceived negative mental, physical, and psychosocial health implications, which they perceived to implicate their academic abilities. While other health-related phenomena such as the 'Freshman 15' have been studied within this age group (170), the starving student norm has not been investigated in the academic sphere. Colloquially, this term refers to the commonality of students eating poor quality foods due to a limited budget (30). Among

students in this study, the perception that being unable to afford adequate healthy foods is a common student experience seemed to reflect an internalization of the norm of the starving student 'lifestyle'. Despite the challenges associated with food insecurity, students' reflections suggest that they remain resilient; for example, students attempted to adapt to financial insufficiency to purchase food, and downplayed the severity of their situation, which might indicate denial as a means of coping.

8.1. Elements characterizing student food insecurity

Feeling preoccupied with the food supply, the timing of quantitative food shortages, qualitative food compromises, and a desire to be independent characterized student food insecurity. These elements coincide with the core components from Alaimo's (2005) model and the food insecurity literature that informed it (11,29,61). Students were preoccupied with their food supply regardless of the degree of food insecurity experienced. Concern over running out of money for food is one of the early indications of food insecurity according to the HFSSM-Adult, therefore, quantitative findings reinforced the qualitative theme of feeling preoccupied with food. Students' preoccupation is similar to how other populations have experienced food insecurity, particularly Radimer's (1992) conceptualization of food anxiety among low-income mothers and Hamelin et al.'s (2002) examination of food-insecure families in Quebec. Hamelin et al. (2002) found that feelings of uncertainty and panic regarding the food supply were common among adults living in food-insecure households (29). The experience of food shortages is a key aspect of food insecurity (11,29,63,64). Students experiencing moderate and severe food insecurity described eating less and skipping meals when money for food ran out, and noted the flexible nature of their food budget compared to other necessities such as rent and tuition. Just as a preoccupation with the food supply is an early indicator of food insecurity, compromises in food quantity and quality are indicative of moderate and severe food insecurity as opposed to marginal food security. Other populations experiencing food insecurity have also described making 'trade-offs' or 'juggling' various

financial priorities, including food, housing, and debt payments (63,64). The occurrence of student food shortages followed a particular pattern and fluctuated over time; shortages coincided with the end of the academic semester when government loan payments ran short, to students at various years of study. Although only two students in this study were in fourth year, both commented that food shortages had become particularly difficult as financial support from co-op jobs and student loans were running out. Campus food bank statistics reflect these findings; although students from all years of study access the food bank, 58% of visitors during the winter 2016 semester were 4th or 5th year undergraduate students (139). Moreover, during fall 2015 and winter 2016, the greatest number of food bank visits occurred near the end of the fall semester, in November 2015 (169). January 2016 also saw a high number of visits, which was not noted by students in this study. It may be that the financial costs associated with the holiday season create vulnerability to food insecurity early in the winter semester. The pattern of student food insecurity is consistent with observations of Hamelin et al. (2002), who found that food shortages tended to occur at the end of monthly pay periods. Similarly, Tarasuk et al. (2007) found that women living in moderate and severely food-insecure households had significantly lower energy, carbohydrate, and fruit and vegetable intakes towards the end of the month, while Matheson (2002) found that children living in food-insecure households had significantly lower energy intakes when a payday was approaching (171,172). Munro et al. (2013) also found that food-insecure students in South Africa were more likely to experience hunger at the end of the semester compared to the beginning (11,96).

Students described eating various foods they considered to be poor quality, such as those with high energy density and low nutrient density, which is common among other food-insecure populations (11,27). Students reluctantly resorted to eating non-perishable canned foods and frozen foods when they didn't have money to purchase more desirable foods, like fresh produce. Similarly, Nugent (2011) found that students in her study bought foods high in calories but low in nutritional value when money was tight (27). Eating old or unsafe foods was not common in this study, and is also a rare experience in other food-

insecure populations (11,29). Although HFSSM-Adult data was unavailable for the student who had eaten unsafe foods, eating food of questionable safety may occur among individuals at particularly severe levels of food insecurity.

Students' desire to be independent is similar to Hamelin's (2002) themes of powerlessness and lack of control (11). Students expressed that they wanted to be financially stable in their own right and were reluctant to rely on outside financial help, especially from family members. A few domestic and international students in this study had attempted to provide financial support to their families, which may have contributed to food insecurity, but it is unclear whether this is a common experience among food-insecure students. Nugent (2011) also found that students strove to be financially self-sufficient, and placed value in remaining as independent from their families as possible (27). Students' desire to unburden their families and attempts to provide financial support are similar to the behaviours of children living in food-insecure households; Fram et al. (2011) found that children and adolescents managed food insecurity on behalf of their families by eating less without being asked, and tried to supplement their parents income via a part-time job (173). Although this study did not delve into life before university, it may be that students in this study grew up in households where money for food was scarce, and were therefore accustomed to managing resources on behalf of their parents. Students may try to 'make do' with the limited finances they have during university to avoid exacerbating precarious family finances, even if this results in food insecurity. Within the context of the post-secondary system in Canada, the majority of students receive some level of financial assistance from family members due to the high cost of education (98). Indeed, systems of financial aid for students in Canada expect some degree of parental financial support, as well as the ability of students to contribute savings through a summer job. However, these results suggest that parental financial support may not always be available, which may create vulnerability to food insecurity during university.

8.2. Factors associated with vulnerability to food insecurity among students

As expected based on the prior literature and conceptualizations of food insecurity as a manifestation of insufficient financial resources (39,161), students' descriptions of their experiences suggested that precarious financial situations contributed most prominently to student food insecurity. Income has been shown to be one of the biggest determinants of food insecurity among other low-income populations (174). Prior research indicates that food-insecure students are not prepared to deal with financial shocks, due to a lack of emergency financial support (25,27). A common shortfall that prevented students from absorbing financial shocks were insufficient OSAP installments, which is similar to the experiences of Canadians who rely on social assistance (174). Canadian households who report social assistance as their main source of income are consistently disproportionately affected by food insecurity (1,174,175). Although OSAP is designed to provide students with the money they need for tuition and living expenses, amounts granted through OSAP system are based on assumptions of familial financial support, which may create vulnerability among students who are unable to rely on their parents for assistance for various reasons. There is some evidence that student provincial loans in Alberta and Ontario are insufficient for the payment of rent and nutritious foods (94,111), but more research is needed to examine the adequacy of these loans for students to achieve basic needs, including food security. Nonetheless, the existing evidence suggests that funding systems in Canada need to be revamped to better reflect the financial realities of students.

The high cost of healthy foods such as fruits and vegetables were perceived as barriers to food security for students in this study. Food insecurity has been associated with poor diet among post-secondary students and other low-income populations (2,4,27,176,177). The prices of healthy foods have made healthy eating challenging for Canadians in general; a recent nationally representative survey found 38% of Canadians found it difficult to afford nutritious foods (178). Students also suggested that other costs of living, such as rent, were barriers to food security. Similarly, a qualitative study by Rodriguez et al.

(2016) found that the high cost of rental accommodation in the Region of Waterloo was a barrier to food security among recent immigrants (176). In 2015, the Canadian Centre for Policy Alternatives analyzed the regional cost of living in Ontarian cities, and determined that the minimum wage in Ontario was 70% of what was required to purchase basic necessities in Waterloo region, including rent, food, childcare, and transportation costs (73). The minimum wage covered even smaller proportions of the cost of necessities in Toronto, Halton, and Peterborough regions (73). Rates of regional food insecurity in 2012 indicated that 13.9% of households in Kitchener experienced food insecurity, compared to 9.3% in Hamilton and 10.4% in London (39). Considering that students are likely to earn minimum wage through part-time jobs and need to absorb a variety of school-related costs, these findings indicate that the costs of living in Waterloo may be contributing to the vulnerability of post-secondary students. This vulnerability may be forcing more young adults to remain at home during university and avoid financial struggles; Statistics Canada reported that as of 2011, 42% of adults between the ages of 20 and 29 live with their parents compared to 27% in the 1980s (179).

Similar to costs of living, physical availability and access to food, particularly limited access to fresh groceries and cultural foods, were key community-level factors. Although the relationship between the food environment and health outcomes are unclear (180), prior literature suggests that geography and transportation can aggravate financial challenges related to food access in developed countries (49). Students primarily used public transportation to get around, and therefore felt that they had limited access to groceries and a high degree of access to convenience and fast food locations. Similar to the students in this study, immigrants in Rodriguez et al.'s (2016) study felt they had limited access to fresh produce in the Region of Waterloo. Immigrant participants dealt with limited access by visiting the closest retail food outlet and purchasing lower quality foods (176). In addition, the University of Waterloo has an ethnically diverse student population, and cultural food helped students in this study remain connected to their place of origin and feel comforted in unfamiliar surroundings. Therefore, the lack of access to

cultural foods both on and off the Waterloo campus was problematic within the context of University of Waterloo students. Rodriguez et al. (2016) also found that access to cultural food in the Region was an issue among ethnic minorities; similar to the students in this study, immigrant participants would go out of their way to access cultural foods from other towns and cities (17). Objective and perceived food access in the Region of Waterloo was examined in a study by Minaker et al. (2013), who found that there were over five times as many convenience food outlets as grocery stores (181). This study also found that a few objective measures of the food environment could predict perceived access to food, including the availability of fruits and vegetables (181). Although this study did not find an association between perceived food access and health outcomes, these findings reflect that supermarket operators are not attentive or responsive to the needs of the student population in Waterloo, and may require incentives to be located in underserved areas; for example, students in this study were confused about the lack of discount grocery stores near student housing areas in Uptown Waterloo, and saw this as a barrier to purchasing low-cost groceries. However, individual or household income is a hypothesized mediator in the relationship between perceived and objective environmental food access, which indicates that increased physical availability to healthy foods may mean very little if students are unable to afford these items (182). In sum, these findings demonstrate that the affordability of basic needs and access to food can be greatly impacted by individual, community-level, and regional factors. As food environment barriers are unique to the neighbourhood and regional context, examining local environmental factors from the perspective of people living in these areas in combination with objective measures are key to gaining a better understanding of the barriers to food access.

Several students enrolled in the co-op stream were eligible for inclusion in this study, which was surprising considering the assumption that co-op jobs are accompanied by extra income. Co-op programs have been found to enhance student work-related self-efficacy and confidence during university and contribute to student retention (183). Despite the benefits, insights from co-op students in this study

indicated that challenges with predicting future income and expenses exacerbated financial instability. These findings align with the prevalence of co-op student users of the campus food bank (139). Although there has been a wide variety of literature on the positive aspects of co-op programs, very little research has examined unintended consequences of co-op. A review of co-op programs may help to identify different strategies that could help students better predict the income required on co-op terms.

Visitor data from campus food banks in Alberta provide some indication that international students may be at increased risk for food insecurity during university (106,168). International students in this study experienced unique financial barriers, such as high tuition rates and difficulty with the Canadian banking system, yet to the knowledge of the researcher, there is no peer-reviewed research examining food insecurity among international students with which to compare these findings. Studies conducted in Canada and the U.S. indicate that a lack of knowledge of community resources may exacerbate food insecurity among immigrants, yet social networks may ameliorate some of the associated hardships (176,184). For example, Rodriguez's (2016) examination of recent immigrants to Canada suggests that informal social networks were an important for information and resource sharing (176). International students may only be living in Canada for a short period of time, and therefore may have fewer informal social networks to draw upon during periods of food shortages, which could be forcing them to rely more heavily on emergency food services.

8.2.1. Barriers to healthy eating

In addition to factors that contributed to food insecurity, students identified barriers to healthy eating that might affect the student population more broadly. While some students in this study were unsure of their cooking skills, others were confident in their abilities and had used their challenges associated with food insecurity to become more creative and proficient in the kitchen. For example, although Parth had not been raised in a household where he gained cooking skills, he adapted during his

university career and had learned to cook as a means of sharing food with friends and saving money on groceries. Research on cooking skills and food insecurity among students is mixed; for example, while Gaines et al. (2014) found that food-insecure post-secondary students demonstrated lower self-efficacy related to cooking than food-secure students, Hughes et al. (2011) found no significant relationship between food insecurity and cooking skills among students (21,25). Qualitative findings may reveal reasons for the mixed findings in the quantitative literature. In a study of student food bank users in Alberta, Nugent (2011) found that some students had adequate cooking skills and some did not. However, students with a lack of cooking skills had felt this had exacerbated their food insecurity, as they felt less able to prepare low-cost meals (27). Students in this study indicated that they struggled with transitioning from their familial home to living independently for the first time, particularly in terms of food budgeting. Difficulty transitioning from the family home to university is a trend among both food-insecure students and post-secondary students, in general (27,177,185). For example, similar to Kelly and Aryan who were learning to budget, younger students in Nugent's (2011) study had difficulty with spending "responsibly" while older students had learned to prioritize necessities such as food (27). Hartman et al. (2013) conducted focus groups to determine barriers to healthy eating among university students, and found that students struggle with food budgeting and planning out food needs for the week ahead (177). Hartman et al (2013) also found that students who have inadequate knowledge of basic nutrition and cooking have low self-efficacy when it comes to healthy eating (177). While cooking skills and food budgeting may be an issue among food secure and food-insecure students, other vulnerable populations engage in strategic food shopping and cooking to make ends meet. For example, Buck-McFayden (2014) found that rural women living in food-insecure households were highly skilled at meal planning and rarely wasted food (63). These women described growing up in families where cooking and food skills were passed on to them from their parents, which is in contrast to several students in this study who had not gained food literacy skills during their childhood (63).

Time was considered a major barrier to food access for many students. Students struggled with finding enough time to buy groceries, prepare meals, and to eat. Despite having insufficient financial resources to purchase more expensive prepared foods, students sacrificed money for time to put towards school priorities. Hughes et al. (2011) found that time management was associated with food insecurity among students, although it is unclear how the authors defined or measured time management (21). Nugent (2011) found that students attempted to balance their time between conflicting student responsibilities, social and family commitments, and food priorities (27). Time is a barrier to food access and healthy eating among a variety of populations in Canada and the U.S., including recent immigrants and young adults (186–188). The findings from this study suggest that students do not feel they can maintain a healthy lifestyle due to time and financial constraints. The expectations for students to commit time towards school, and the financial need for students to hold down multiple part-time jobs on top of school priorities, may not be allowing students the time for food access and preparation, and subsequently are not setting students up to prioritize their health.

8.3. Attempts to cope

Coping strategies used by students in this study, such as borrowing money from family or friends, food sharing, couponing, and food budgeting, are similar to those used by other food-insecure populations (11,68,189). Farahbakhsh et al. (2016) examined coping strategies among student food bank users in Alberta, and found that they commonly accessed student loans or credit and had part-time jobs to supplement their finances (106). Budgeting behaviours have been associated with student food insecurity but it is unclear whether these strategies are a predictor of, or coping strategy for food insecurity (21,25). Students were faced with immense pressure to spend money on food and entertainment with their friends, and as a result, some had felt they spent unnecessarily and were actively budgeting their remaining funds. Meal Exchange recently published a report addressing the 10

myths of student poverty, one of which addresses students' inability to budget their money (190). The authors argued that students are not provided with enough money to budget in the first place, emphasized the importance of being able to spend money on enjoyment and stress-relief, and the necessity of 'extra' expenses such as cellphones (190). OSAP considers Health Canada's national nutritious food basket when calculating financial instalments, but this measure is not calibrated to regional differences in food costs (191). To raise awareness of the inadequacy of the OSAP food allowance and to dispel the notion that students ate poorly due to bad budgeting behaviours, the Ontario Undergraduate Student Alliance conducted a 'Food for Thought' campaign in 2010. Students at Western University, Laurier University, Queen's University, and Brock University participated in the challenge by attempting to live on a \$7.50 per day food budget (192). In media releases, students explained that they had struggled to afford healthy foods during the challenge, especially fruits and vegetables (193,194). Other low-income populations have been similarly criticized for spending irresponsibly, despite having insufficient funds to afford basic necessities (39,195). Considering the receipt of a government student loan is prevalent among students struggling with food insecurity (106,107), provincial/federal student financial assistance need to be re-evaluated and calibrated to reflect regional costs of basic needs, including healthy foods.

Students accessed various resources on campus; some visited the campus food bank or sought out activities with free food, while others found studies for which they would receive financial remuneration. This may indicate issues with selection bias, yet may alternatively suggest that students were coping with food insecurity by finding unique ways to access the money they needed. Scientific studies reflect opportunities for financial compensation for limited commitment, and food-insecure students saw this as a way to bolster their dwindling finances without taking up too much of their limited time.

Accessing free food on-campus appears to be a common strategy among other food-insecure Canadian student populations (27). However, only six students in this study had accessed food from the campus food bank, which aligns with Canadian literature that indicates only a fraction of food-insecure individuals access emergency food programs (21,69). These students had experienced moderate and severe food insecurity, which contrasts with previous findings that indicate that severely food-insecure individuals are the majority of emergency food service users (196). These differences may be due to the open and inclusive nature of the campus food bank, compared to the restrictions often placed on visitors of community food programs (e.g. requiring visitors to provide a statement of income) (69). However, the single student in this study who had experienced marginal food security had not accessed the campus food bank, suggesting that those at less severe levels of food insecurity may choose to access alternative resources for food. Both students who did and did not visit the campus food bank demonstrated ambivalence regarding campus food bank use and did not want to abuse the service. These findings were mirrored in Nugent's (2011) study, as those students experienced guilt and stigma when using the food bank and were concerned with accessing a service needed by others who were 'worse off' (27). These findings indicate that campus emergency food services may not be effective at providing assistance to the population they are targeting. Although four students had experienced severe levels of food insecurity, there were no reported instances of more drastic coping strategies, such as dumpster diving and pawning items or stealing food (27). Overall, these findings reinforce the existing literature that indicates that food-insecure individuals utilize a system of strategies to make ends meet (27,43).

Although the students experienced financial food insecurity and had felt the psychosocial implications of this experience, they did not see themselves as 'food-insecure' individuals. Students coped by normalizing their situation or displaying resiliency. For example, some explained that they came from middle class families and had not experienced food access issues before. Some students did not feel like the 'kind' of people who should be accessing food from a food bank. Although stigma was mentioned by

some students as a negative feeling associated with food insecurity and food bank use, other students made no mention of stigma or had conflicting views of stigma. In addition, three students did not respond to the researcher's request to gather HFSSM-Adult data, which may reflect an unwillingness to revisit this sensitive and stigmatizing issue. The lack of recognition or familiarity with food insecurity can be viewed through the lens of the 'emerging adult' theory (123). Students are at an age where they are actively building a sense of themselves and who they want to be, and they are attending university to help shape that identity and become successful and independent adults. Students spoke about their dreams and goals for university and the future, like joining a varsity sports team, changing the focus of their degree, attending graduate school, getting a full-time job, and volunteering. The idea of being 'less fortunate' or 'food-insecure' may not fit in with the successful future students envision.

8.4. Health and academic implications

Students had experienced various health and academic implications of food insecurity, and spoke of these consequences in an interconnected manner. These findings are similar to those of Chilton and Booth (2007), whose phenomenological investigation revealed the complex, interconnected nature of mental, physical, and psychosocial consequences of food insecurity deemed the 'hunger of the body' and 'hunger of the mind' (62). This qualitative research suggests that food insecurity can impact multiple aspects of students' lives, all of which can intersect to produce negative health and academic outcomes.

Students at moderate and severe levels of food insecurity perceived physical health implications (although students who had no HFSSM-Adult data also expressed concerns regarding physical implications). Food insecurity has been associated with markers of poor health across a variety of populations, including children, adolescents, and adults (7,124,125,197,198). Physical health implications described by students in this study, such as poor general health and fatigue, have also been found among students in prior literature (21,22,96). Physical health issues are related to worsening levels of food

insecurity; Tarasuk et al. (2013) analyzed data from the Canadian Community Health Survey and found that adults with a greater number of chronic health problems were at increased risk of experiencing severe household food insecurity compared to those with fewer or no chronic diseases (7). While physical health status may influence food insecurity, this relationship may operate in the opposite direction as well (199). Students in this study also reported weight changes, including weight gain and loss, that they felt had been a result of food insecurity; these findings reflect the conflicting literature on the relationship between food insecurity and weight (200–202). Losing weight is a rare outcome of particularly severe levels of food insecurity (39). Conversely, the obesity-hunger paradox, which refers to high rates of obesity among low-income populations, may be a result of cheap, energy dense, less nutritious foods consumed by those experiencing food insecurity (198), though the literature in this area remains mixed.

Unlike physical health, mental health implications of food insecurity, such as stress, were common among students in this study regardless of the level of food insecurity experienced. The stress and anxiety associated with food insecurity, described above, may be one pathway by which food insecurity impacts mental health (64). Recent research suggests that toxic stress (chronic stress that is not ameliorated by adequate social or environmental buffers) can increase the risk of developing a mental disorder (64,203). Bruening et al. (2016) examined correlates of food insecurity among students in the Midwestern U.S., and found that students who reported food insecurity had nearly three times the odds of experiencing depression, and nearly two times the odds of having an anxiety disorder compared to food-secure students (204). However, this study and others that have examined health implications of student food insecurity have been cross-sectional (21,23). Evidence suggests that the relationship between depression and food insecurity is bidirectional among women, meaning depression and other mental health problems contribute to food insecurity by inhibiting earning ability, and conversely, food insecurity can lead to the experience of depressive symptoms (6,205). McIntyre (2013) analyzed Canadian longitudinal data and found that instances of food insecurity among adolescents and young adults can

increase the likelihood of experiencing suicidal ideation in adulthood (124). Therefore, it is possible that students who experience high levels of stress as a result of food insecurity could have long-term mental health ramifications. Longitudinal research among emerging adults who experience food insecurity during university is needed to determine far-reaching implications of food insecurity in later life.

Students in this study experienced a variety of psychosocial ramifications of food insecurity. Students felt excluded when they were unable to afford social outings with friends and when they were unable to purchase organic or local foods. Students also experienced isolation and guilt when they had to curtail social activities due to limited finances, and when they felt as though they had to hide their financial situation from friends and family. Similarly, students in Nugent's (2011) study also felt guilty over small purchases and embarrassed of their food insecurity (27). Hamelin et al. (2002) found that individuals living in food-insecure households mourned the loss of valued social rituals centered around food, and felt the need to hide food insecurity from others (11). The authors explained that feelings of powerlessness and the inability of marginalized groups to participate in social life could have long term implications, including the disruption of economic and social development (206).

Finally, some students explained that food insecurity and financial insufficiency had become too much to handle, and reducing their schooling was one way to alleviate these stresses. Although some students who experienced this did not have HFSSM-Adult data, nearly all of the students who dealt with severe food insecurity felt it had impacted their academics. This may be indicative that severe levels of food insecurity influence not only students' health, but begin to infiltrate the priority areas of their lives, such as school. Negative academic ramifications of food insecurity align with the few studies that have examined student food insecurity and academic performance (22,96). Gallegos et al. (2013) examined food-insecure students in Australia, and found that these students were 3 times as likely to have deferred their studies as a result of financial hardship compared to food-secure students (22). Munro et al. (2013) found that students who had experienced food insecurity also reported difficulty concentrating (96).

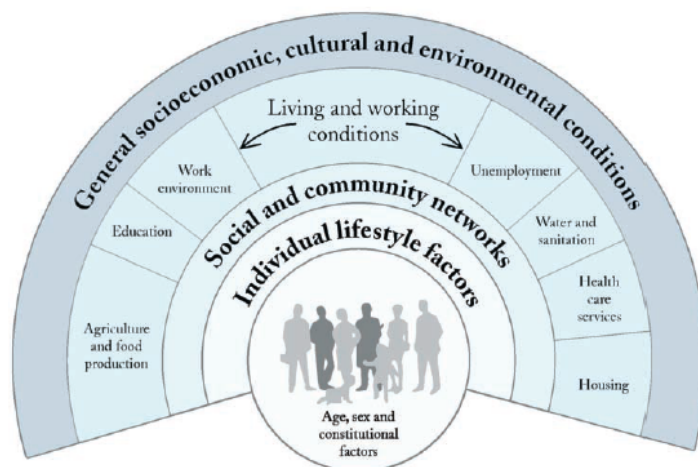
These findings indicate the gravity of food insecurity among a student population; despite the normalcy of the 'starving student' lifestyle, some students may struggle financially to the point where school is no longer worth the stress.

8.5. Social determinants of health: Informing strategies for moving forward to address student food insecurity

This study and prior literature suggests that the food security among post-secondary students is dependent on individual, university, broader community or region, and provincial or national factors. In addition, a wide variety of components are unique to the post-secondary student context, including the level of financial assistance from family members, the receipt of student loans or grants, the cost of living in a particular region, and university tuition costs. Therefore, student food insecurity is complex and contextually specific, which played out in a variety of ways for students. For example, students in this study often experienced multiple, intersecting barriers to food access. Food environment barriers such as grocery store location and slow public transit, combined with a lack of time and low food literacy, resulted in the purchase of cost-ineffective prepared foods, which exacerbated financial insufficiency. Complexity also arose in the complicated management techniques that students engaged in to ensure they would have enough food; students made trade-offs between food and other necessities and balanced various coping strategies. In addition, well-intended provincial and university-level programs had unintended consequences; late or insufficient OSAP instalments contributed to periods of food insecurity, and the need to anticipate future income on OSAP applications was difficult for students who were unsure of their income and living expenses during co-op terms. Another example of complexity lies in the timing of food insecurity; although many students ran out of money for food at the end of the academic semester, students experienced food insecurity at all points during their undergraduate degrees based on the presence of various financial vulnerability factors. Food shortages often coincided with exam periods, some of the busiest and most stressful times of year for students, which exacerbated

anxiety over the food supply and added to the stress they were already feeling over school. Students understood the connection between good mental health, healthy eating, and good grades, yet were unable to allow the time and money needed to adequately maintain these priorities. The complex and contextual nature of student food insecurity means that solutions and interventions need to target not only individual-level financial factors and capabilities, but also university-level factors such as tuition rates, and provincial or federal factors such as loan policies. This complexity is important to consider in terms of considering solutions to address food insecurity among this population.

Figure 4: Determinants of health ¹



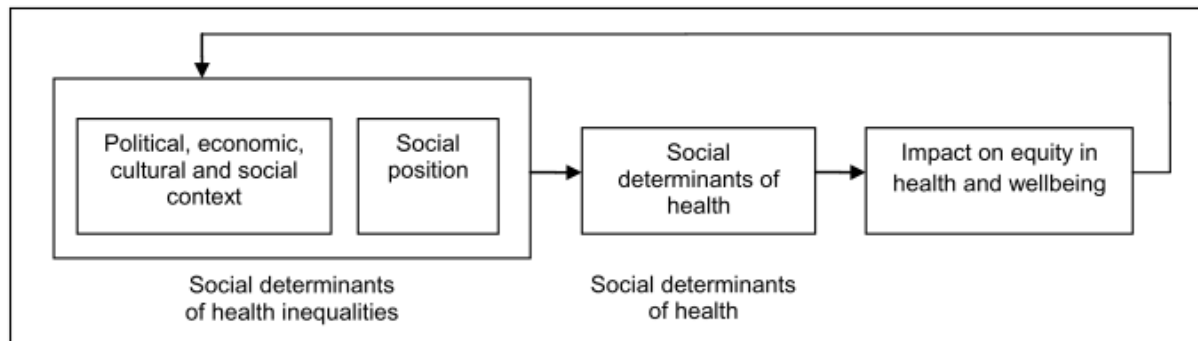
[1] Dahlgren G, Whitehead M. *Policies and Strategies to Promote Social Equity in Health*. Stockholm: Institute for Futures Studies; 1991. Cited by: Mikkonen J, Raphael D. *Social Determinants of Health: The Canadian Facts*. Toronto, ON: York University School of Health Policy and Management; 2010.

Food insecurity is recognized in Canada as a social determinant of health (207). The social determinants of health are living circumstances that shape individual health outcomes [see Figure 4] (208). Although individual behaviours can influence health, the social determinants of health approach argues that these choices are inherently shaped by social, cultural, and economic context (208). The social determinants of health provide a lens through which to view the various factors associated with vulnerability to food insecurity among students. For example, while individual factors like food literacy may contribute to eating behaviours of students, these factors are inherently shaped by structural and

environmental conditions like availability of healthy, affordable foods within the food environment, and adequacy of finances.

Furthermore, as a social determinant, food insecurity can be viewed within the broader context of the social determinants of health inequalities (209). International and national health organizations have argued that a broad set of economic, social, and political forces create an unequal distribution of power and resources which result in health inequalities between groups of people (209,210). The National Collaborating Centre for Healthy Public Policy (NCCCHPP) adapted the World Health Organization's social determinants of health framework to better reflect the social determinants of health inequalities (209,210) [see figure 5]. This figure demonstrates how social determinants connect with one another and broader societal structures to influence health. The political and economic context along with cultural and social factors can influence whether an individual's social position will result in an unequal distribution of power and resources (209). In the case of student food insecurity, the Canadian post-secondary system and financial assistance policies, along with dominant social norms (the 'starving student' norm) and students' social position (determined by their family's socioeconomic status and international student status), result in vulnerability to food insecurity during university. As demonstrated by the health and academic implications perceived by the students in this study, these factors may culminate to have a negative impact on health, wellbeing, and success. Although individual factors (such as food literacy and time management) may still play a role in students' food security and health outcomes, broader structural constraints play a much larger role by determining who has access to financial resources in the first place. Considering the potential for structural elements to influence individual vulnerability, taking a multi-sectoral, broad approach to addressing the root causes of food insecurity is crucial to effectively addressing this issue (see chapter 8.6.)

Figure 5: NCCHPP's framework of social determinants of health and health inequalities ¹



[1] Mantoura P, Morrison V. *Policy Approaches to Reducing Health Inequalities*. Montréal, Québec: National Collaborating Centre for Healthy Public Policy; 2016

In addition to sharing their experiences of food insecurity, participants in this study provided suggestions for alleviating this problem among post-secondary students. Many suggestions focused on enhancing emergency food programming and education, such as cooking and budgeting workshops and raising student awareness of existing resources. However, evidence suggests that food literacy and other capacity-building programs that target individual behaviors are ineffective at reducing rates of food insecurity among young adults and other vulnerable populations (90,91,211). These strategies may help students to develop their skills and ease their transition into adult life, but they do not directly address the structural determinants of financial insufficiency. The difficulty students had with envisioning institutional or governmental changes demonstrates the institutionalization of 'Band-Aid' solutions like food banks and the ubiquitous nature of the starving student norm (51,212). Students lack of identification with food insecurity may also demonstrate the pervasiveness of the starving student ideology in Western society, which indicates that being unable to afford food during post-secondary school is not only acceptable, but a rite of passage that students must go through to attain a higher education (30). The findings from this research indicate that despite being aware of the negative implications food insecurity had on their lives, to some degree, students identify with and internalize this norm. However, to the extent that this reflects compromises in food to the extent that students experience negative implications for their health and well-being, the norm of starving student may need

to be reframed as a serious public health problem and a demonstration of the lengths through which students are expected to go through to attain higher education in Canada. Students should not be forced to choose between food access, good health, and the attainment of a post-secondary degree. Targeting the financial root causes of food insecurity is the most effective and comprehensive way to tackle this issue (51,167).

Considering that food insecurity is a social determinant of health, approaches to alleviate food insecurity need to target the structures that create vulnerability to poverty. One approach to addressing food insecurity as a social determinant of health is through social justice and human rights. Chilton (2009) argues for a human-rights approach to food security, challenging 'needs-based' strategies that entrench charitable causes as the solution to food insecurity and treat individuals as passive recipients of emergency food assistance (213). A human-rights approach emphasizes the creation and maintenance of supportive structures and environments that enable people to play an active role in their food access (213). Human-rights approaches to food insecurity have begun to take hold in Canada through grassroots organizations like Community Food Centres Canada, whose mission has been to alter the traditional food bank model by adopting citizen advocacy and empowerment strategies (214). The following initiatives to tackle student food insecurity have been adapted from Chilton's (2009) framework for a human rights-based approach to food, addressing elements of accountability and public participation, accounting for vulnerability and discrimination, and connecting policies and implications (213). In terms of accountability, student food insecurity should be monitored among post-secondary institutions in Canada similar to national monitoring (1), in order to gain a better understanding of the different prevalence rates between schools and regions. As food insecurity is complex and operates at multiple levels, the creation of a multi-sectoral governmental group would help coordinate efforts in many areas of influence. This group could include key stakeholders and non-profit initiatives such as Meal Exchange to take advantage of existing networks. In terms of public participation, research on the experience of food insecurity among students

need to be shared with the media, post-secondary students, and broader society. Awareness needs to be raised about the prevalence and implications of food insecurity among this age group. Students need to be made aware that they are not alone if they are struggling with financial access to food, and that this problem is indicative of a wider societal issue of the structural determinants of health inequalities (209). Benchmark goals need to be set to reduce student food insecurity, and students need to have the opportunity to provide feedback and insight. To address vulnerability and discrimination, existing structures like OSAP and any future policy changes need to be assessed for their potential to exacerbate food insecurity or to exclude different groups of students, which could subsequently widen health inequalities (209). Changes to financial assistance policies, like restructuring student debt, re-calibrating student loans to reflect the costs of basic needs, or implementing a basic income for Canadian adults, are needed to ensure that students will have access to the finances they need to complete their education and other training without running out of money for food (166). Overall, universities and governments should be encouraged to create supportive structures for students, as opposed to maintaining systems that seem to work against student food security, health, and success.

While a human-rights approach to food may be an important starting point for improving food security among students in a comprehensive way, there are some strategies that can be readily initiated at the University of Waterloo to begin to address student food insecurity. University-level strategies should address financial access to healthy food. For example, the university could raise student awareness of opportunities for financial assistance, such as internal and external bursaries. Another strategy would be to provide a voucher or coupon for produce from the SLC Farmer's Market. These types of programs are not helping students if they are unable to afford them, and by providing financial incentives, the university could support and encourage the market to enhance vulnerable students' access to healthy food. Another university-level strategy to help students with timely physical access to

groceries could be greater advertisement and increased service of the shuttle that runs from campus residences to local supermarkets.

Consistent with the need for strategies that operate at multiple levels, the university could not only assist with students' financial access to healthy foods, but also enhance students' abilities to better cope with food insecurity. Offering financial budgeting and cooking workshops could provide all University of Waterloo students with an outlet to enhance their skills, as long as these strategies do not displace much-needed changes to financial assistance. Although these types of skill-building workshops may not address underlying financial causes of food insecurity, they could provide the benefit of building community, social support, and advocacy for students who are feeling isolated or excluded due to food insecurity. Another strategy relates to health care access. The university should continue to advertise and enhance student access to mental health care services on campus, especially targeting students who may be experiencing stress or worry over their financial access to food. Mental health counselors should have the ability to screen students for food insecurity if they suspect a student is struggling financially, and be able to refer these students to financial and food resources.

Finally, raising awareness of student food insecurity at the University of Waterloo among students, faculty, and administrative staff could start a much-needed conversation about long-term, effective solutions. The University of Waterloo needs to make a commitment towards changing the structures that make it difficult for students make healthier choices, and to dismantle the assumption that students must eat and feel poorly throughout school.

8.6. Directions for future research

This study examined food insecurity among undergraduate students, but additional research is needed to examine food insecurity among targeted student groups. For example, there is almost no research examining the experience of student food insecurity based on race or international student

status (107). Research is needed to gain a better understanding of the financial factors that create vulnerability to food insecurity among international students and to better target the specific needs of this population. In addition, although strategies need to address underlying financial causes, other factors that may complicate student food insecurity among specific groups of students need to be clarified. Along with financial challenges, international students in this study dealt with language barriers, loneliness, and difficulty adjusting to Western culture. Moreover, little is known about food insecurity among graduate students and other individuals within the academic community, such as post-doctoral fellows. If food insecurity is an issue among undergraduate students, it is possible these issues pervade other areas of academia. Although there were no instances of parents compromising their diets to provide for their children, it would be pertinent to explore food insecurity among mature students with families, including graduate students and international students, to determine whether students who are parents engage in similar behaviours. Longitudinal research is key to examining the long-term health implications and food security outcomes for food-insecure students as they leave university and enter the labour market. Research is also needed to determine the impact of policy changes to provincial student financial assistance. For example, the Ontario Student Grant will take effect in September of 2017 and provides a natural experiment; the 2016-2017 academic year is the last chance to measure rates of Ontario student food insecurity to determine the efficacy of these policy changes.

There is also a need for research to examine methods of food insecurity measurement among a post-secondary student population. Although the HFSSM is considered the gold standard of measurement in food insecurity research, it may need to be modified for a post-secondary student context. For example, the HFSSM-Adult assumes that the adult individual is either living alone or living in a traditional household with family members, which is not necessarily the case for students. The HFSSM is designed to measure the level of household food insecurity experienced over the last 12 months, yet students often spend the summer semester in their family homes and students enrolled in the co-op

program change their living situation each semester. Therefore, the nuances of students' living circumstances may not be captured in the existing 12-month measurement. Moreover, as discussed in the earlier sections, students may be completely unaware that they fall within a traditional 'food-insecure' category. Although it does ask the respondent about worry, the HFSSM only measures qualitative and quantitative components of food insecurity and does not determine whether students are emotionally or cognitively aware of their food insecurity. The HFSSM also does not ask about students' usage of what might be considered 'socially unacceptable' means of acquiring food, such as food banks or other emergency food services. There are many instances of the HFSSM being adapted or modified for different populations (215,216). Hromi-Fielder et al. (2009) adapted the HFSSM for a low-income, young adult pregnant Latina population (215). Based on the women's recommendations, the authors adapted the HFSSM to be more understandable for the Latino population, including changing the term 'balanced' to 'healthy and varied'. Similarly, Urke et al. (2014) found that it was possible to use an adapted single item from the HFSSM to adequately measure household food insecurity among Inuit families living in Nunavut (216). It may also be necessary to use a different form of food insecurity measurement among the student population. Research has shown that the experience of food insecurity for children is quite different from adult reports (173,217,218). The different experience and interpretation of food insecurity among age groups may explain the impact on the health and wellbeing of children and youth, despite parental attempts to protect them (65). Fram et al. (2015) created the Child Food Security Assessment tool, which assesses a child's physical, emotional, and cognitive awareness of food insecurity within a household (219,220). Although post-secondary students have technically entered adulthood, the use of a measure that incorporates awareness in addition to qualitative and quantitative components may provide a more accurate assessment of food insecurity within an 'emerging adult' population.

More focussed research is needed within the University of Waterloo context. For example, comprehensive, contextual evaluations of the University of Waterloo's co-op program are needed to

determine the unintended consequences of co-op. Process evaluations of the Feds Student Food Bank and the SLC Farmer's Market could provide feedback on how well these initiatives serve the food-insecure student population and provide directions for improvement.

8.7. Limitations

This study has several limitations. Recruitment took place during the winter and spring semesters, therefore, there was the potential for selection bias if students who were away from campus completing a co-op term during these months were not exposed to the on-campus flyers. Another limitation of on-campus recruitment is that it potentially excluded students who struggled with severe levels of food insecurity to the point where they drop out of school. Accessing remuneration from on-campus studies was noted as a coping strategy among a few participants, potentially indicating the potential for measurement bias in this study. However, the recruitment materials were carefully phrased to gather a sample of students who had dealt with food access issues during university, and the HFSSM screener was chosen due to its utility as an adequate measure of vulnerability with the added benefit of low respondent burden (152,153).

HFSSM-Adult data were gathered from 11 of 14 participants; thus, it was not possible to use detailed data on experiences of food insecurity to contextualize qualitative findings among the full sample. In terms of measurement, despite being the most valid and reliable tool with which to measure household food insecurity in Canada (39), the HFSSM-Adult may be limited in its ability to accurately measure food insecurity among a student population. Students had difficulty answering questions from the HFSSM-Adult, which has been an issue among other populations (215); for example, the researcher had inquiries from students about what a 'balanced diet' was, and whether making trade-offs between food and other necessities would 'count' as running out of money for food.

Interviews were conducted with a purposive sample of 14 student participants, which was sufficient for theoretical saturation. While the qualitative nature of this research limits generalizability,

the results from this study may be transferable to other post-secondary student contexts. Finally, qualitative research has been criticized for being subject to researcher or experimenter bias (165). Efforts were made by the researcher to minimize bias through inter-coder agreement, peer debriefing, and regular consultation with her supervisor and members of the research team.

8.8. Conclusions

This study has started to address the lack of qualitative inquiry and has begun to fill the gap in research on student food insecurity and its implications in Canada. This study improved upon prior qualitative investigations by recruiting outside of a campus food bank setting, which allowed for a more comprehensive understanding of the experiences of food-insecure students who did and did not access emergency food services. The data gathered from the HFSSM-Adult provided greater context for the experiences of food-insecure students; specifically, it allowed the researcher to compare the main elements that emerged from the interviews with those affiliated with Health Canada's food security categories. These findings contribute to a better understanding of the perceptions of university students who experience food insecurity and how they differ from other vulnerable populations. While some elements, like preoccupation with the food supply, quantitative food shortages, and qualitative food compromises aligned with these categories, other elements like a desire to be independent and the temporality of food shortages could not be captured with the HFSSM-Adult. These similarities and differences demonstrate the value of using multiple methods to explore the complex experience of food insecurity.

These exploratory findings suggest that food insecurity among post-secondary students is a serious issue with critical implications. These findings add to the growing argument that Canadian financial support for post-secondary students is inadequate for the maintenance of food security during university. Future strategies must address the root financial causes of food insecurity among students in order to create effective, long-lasting change.

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Appendix A: On-campus flyer

STUDY ON FOOD ACCESS AMONG UNDERGRAD STUDENTS



PARTICIPANTS NEEDED

Participation in this study will involve completion of two short surveys and a face-to-face interview (about 75 minutes total).

The aim is to understand experiences of students who face challenges in accessing food. If you fit the following criteria, you may be eligible to participate:

- You are enrolled as an undergraduate student at the University of Waterloo
- You have been enrolled for at least 12 months
- You live off-campus (i.e., you **do not** live in a University of Waterloo residence building)
- You are at least 18 years of age

In appreciation for your time, you will receive a **\$20 grocery gift card**.

If you are an undergraduate student, visit the following website to find out more:

<http://studentfoodaccess.hostedincanadasurveys.ca/index.php/186546?lang=en>

You may also contact **Merryn Maynard** at msmaynar@uwaterloo.ca

This study has been reviewed by, and received ethics clearance through a University of Waterloo Research Ethics

<http://studentfoodaccess.hostedincanadasurveys.ca/index.php/186546?lang=en>

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<http://studentfoodaccess.hostedincanadasurveys.ca/index.php/186546?lang=en>



Appendix B: Short information letter

STUDY ON FOOD ACCESS AMONG UNDERGRAD STUDENTS PARTICIPANTS NEEDED

We are conducting a study about food access among undergraduate students at the University of Waterloo. The results from this study will be used to educate the student body and the university administration on issues of post-secondary student food access.

Participants will come from the undergraduate student body here at the University of Waterloo. If you fit the following criteria, you may be a good fit:

- You are enrolled as an undergraduate student at the University of Waterloo
- You have been enrolled for at least 12 months
- You live off-campus (i.e., you **do not** live in a University of Waterloo residence building)
- You are at least 18 years of age

You will complete two short surveys and a one-time, face-to-face interview about your food access as a student. The time commitment for the survey and interview will be approximately one hour and 15 minutes, and will take place in an agreed-upon space on-campus.

You will receive a \$20 grocery card as remuneration for volunteering your time in this study. If you are interested in finding out more, **please visit this website:**

<http://studentfoodaccess.hostedincanadasurveys.ca/index.php/186546?lang=en>

This link will take you to a website where you'll be asked a few screening questions to make sure you are eligible to participate. If you have any additional questions, **please do not hesitate to contact me** using the email address below. You are also welcome to contact Dr. Sharon Kirkpatrick for further information. This study has been reviewed by, and received ethics clearance through a University of Waterloo Research Ethics Committee.

I appreciate your time,

Merryn Maynard

School of Public Health and Health Systems
Faculty of Applied Health Sciences
University of Waterloo
E-mail : msmaynar@uwaterloo.ca

Dr. Sharon Kirkpatrick
School of Public Health and Health Systems
Faculty of Applied Health Sciences
University of Waterloo
E-mail : sharon.kirkpatrick@uwaterloo.ca

Appendix C: On- and off-campus resources

Thank you for participating in this study on post-secondary student food security. For your information, several on and off-campus resources are listed below:

Health Resources:

University of Waterloo Health Services: 519-888-4096

- Contact for an appointment with a physician, registered nurse or dietitian

University of Waterloo Counselling and Psychological Services: 519-888-4567, ext 32655

- Contact for a one-on-one appointment with a mental health counsellor
- They also offer group therapy, coping skills seminars, and workshops

Government of Ontario Mental Health Helpline: 1-866-531-2600, <http://www.mentalhealthhelpline.ca>

- A confidential 24/7 service that can provide information on counselling services in your area, listen and provide strategies, and give mental health education

Good 2 Talk Post-Secondary Student Helpline: 1-866-925-5454, <http://www.good2talk.ca/>

- A confidential 24/7 service that provides immediate mental health counselling and provides on or off-campus referrals

Food Resources:

Food Bank of Waterloo Region: 519-743-5576, 50 Alpine Ct. Kitchener

- Monday-Thursday 8:30-4:30
- Friday 8:30-3:00

Waterloo Region Food System Roundtable: info@wrfoodsystem.ca, <http://www.wrfoodsystem.ca/>

- An organization working towards creating a more sustainable, healthy food system

The Working Centre: 519-743-1151, 58 Queen St. South, Kitchener

- A non-profit organization that provides job search resources, community kitchen programming, community tool share program, and access to technology and housing

Appendix D: Online screening questionnaire

Introductory Webpage:

“Hello! Thank you for your interest in the study on post-secondary student food access.

Merryn Maynard and Dr. Sharon Kirkpatrick of the School of Public Health and Health Systems are conducting a study about food access among undergraduate students at the University of Waterloo. The results from this study will be used to educate the student body and the university administration on issues of post-secondary student food access.

On this website, you will be asked questions to check whether you are a good fit for this study. This will only take a couple minutes. If you are eligible to participate in this study, the final webpage will ask you for your email address or phone number so that we can contact you regarding your participation. The information you provide on this website will be stored on a secure database in Canada, and will be accessed only by the student researcher (Merryn Maynard). If you have questions about your eligibility or any of the screening questions, please email Merryn Maynard at msmaynar@uwaterloo.ca. Click continue to proceed.”

Screening Questions:

1. Are you enrolled as an undergraduate student at the University of Waterloo?
 YES
 NO

2. Have you been enrolled as a student at the University of Waterloo for at least 12 months?
 YES
 NO

3. Do you live on-campus during the academic year? For example, in a residence building on campus?
 YES
 NO

4. Currently, do you live with a parent or a guardian?
 YES
 NO

5. Are you 18 years of age or older?
 YES
 NO

6. This next question is about the food eaten in your household in the last 12 months, since [January] of last year, and whether you were able to afford the food you need. Which of these statements best describes the food eaten in your household in the last 12 months:

- 1) Enough of the kinds of food we/I want to eat
- 2) Enough but not always the kinds of food we/I want
- 3) Sometimes not enough to eat
- 4) Often not enough
- 5) Don't know

6. a) [If Option 3 or 4 selected, ask] Here are some reasons why people do not always have enough to eat. For each one, please tell me if that is a reason why YOU don't always have enough to eat.

Yes	No	Don't Know	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not enough money for food
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not enough time for shopping or cooking
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Too hard to get to the store
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	On a diet
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No working stove available
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not able to cook or eat because of health problems

6. b) [If option 2 selected, ask] Here are some reasons why people don't always have the quality or variety of food they want. For each one, please tell me if that is a reason why YOU don't always have the kinds of food you want to eat.

Yes	No	Don't Know	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not enough money for food
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not enough time for shopping or cooking
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Too hard to get to the store
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	On a special diet
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kinds of food (I/we) want are not available

If potential participants fulfill any of the exclusion criteria, a screen will be displayed that reads:

“Thank you so much for your interest in participating in this study. I'm afraid that you may not be the best fit for this study, as you do not fulfill all of the criteria. Thank you again for your time, and have a good day.”

*** If potential participants fulfill all of the inclusion criteria, a screen will be displayed that reads:***

“Thank you so much for your interest in participating in this study. It seems that you are a good fit to participate in this study. Please provide your email address or telephone number and Merryn Maynard will contact you to set a date and time during which we can talk further about this study.”

Appendix E: Detailed information letter



Detailed Letter of Information

A Study of Student Food Access at the University of Waterloo

Dear University of Waterloo student,

My name is Merryn Maynard and I am a master's student in the School of Public Health and Health Systems at the University of Waterloo. I am conducting a research study as a part of my degree. The topic is food access among post-secondary students. This letter will give you more information so that you can make an informed decision about your participation. Participants for this study will come from the undergraduate student body here at the University of Waterloo.

What will I be asked to do?

You will be asked to complete two short surveys and a one-time, face-to-face interview. The surveys and interview will take place in a space on-campus that you and I agree upon. The questions on the first survey will ask you some personal questions, such as your year of study and your sources of financial support during university. The questions I will ask during the interview will focus on your experiences with food access during your time as a student. The questions on the second survey will ask you about the food situation in your household, including whether you are able to afford the kinds of food you like. We will begin with the first survey and then move on to the interview. We will follow the interview with the second survey, which I will administer to you verbally. You can skip any questions you do not wish to answer on the surveys or the interview. The time commitment for the surveys and interview is approximately one hour and 15 minutes.

Your participation in this study is voluntary and you can withdraw your participation at any time without any consequences. With your permission, the interview will be audio recorded using a handheld device and transcribed. If you choose to participate, your identity will remain confidential. Your name will not be disclosed on any report or thesis. However, anonymous quotes may be used in final reports with your permission. Any electronic recordings will be stored on a password-protected laptop and will be erased after seven years. The paper-based survey and any notes I take will be stored in a locked cabinet in my supervisor's office for seven years.

As a student, I recognize that your time is limited and valuable. **Therefore, you will receive a \$20 grocery card as remuneration** for volunteering your time in this study. The amount received is taxable. It is your responsibility to report this amount for income tax purposes.

After the interview, I may ask for your permission to re-contact you at some point over the

next several months, to verify some of my initial findings.

Are there any risks or benefits to my participation?

It is anticipated that this study poses a minimal risk to you. You will be asked for some personal information and stories during the survey and interview, which may cause some emotional discomfort. However, by participating in this study, you have the opportunity to contribute to a final report on the experiences of student food access. You will also be able to provide your own insights and ideas on strategies to improve post-secondary student food access in Canada.

What will we do with your results?

This study is being conducted in partnership with **Meal Exchange**, a non-profit organization that works with post-secondary students to tackle issues of food security and sustainability on Canadian campuses. Your responses and insights will help provide a deeper understanding of student food access in Canada. The results may be used to develop policy papers and initiatives to improve Canadian student food access.

The results from this study will be published in a thesis, which I am happy to provide for you. Some of your responses to the questions in the interview may be included as direct quotes but you will be referred to by a pseudonym (i.e., not your real name). The conversations we have during the interview will be recorded with an electronic recording device. These recordings will be stored on a password-protected computer that only I will have access to. These recordings will be kept until February 2022 and then destroyed.

I would like to assure you that this study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee. However, the final decision about participation is yours. If you have any comments or concerns resulting from your participation in this study, please contact Dr. Maureen Nummelin in the Office of Research Ethics at 1-519-888-4567, Ext. 36005 or maureen.nummelin@uwaterloo.ca. If you have any additional questions, please do not hesitate to contact me using the email address listed below.

Thank you for contributing to this study!

Merryn Maynard

Student Investigator
School of Public Health and Health Systems
Faculty of Applied Health Sciences
University of Waterloo
E-mail : msmaynar@uwaterloo.ca

Project Supervisor

Dr. Sharon Kirkpatrick
School of Public Health and Health Systems
Faculty of Applied Health Sciences
University of Waterloo
E-mail : sharon.kirkpatrick@uwaterloo.ca

Appendix F: Consent form

Consent of Participant

By reading this consent form, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

I have read the information presented in the information letter about a study being conducted by Merryn Maynard of the School of Public Health and Health Systems at the University of Waterloo. I have had the opportunity to ask any questions related to this study, received satisfactory answers to my questions, and have been given any additional details I requested. I am aware that the study is voluntary and I may withdraw from participating without penalty at any time by advising the student investigator of this decision. I understand that my participation in this study involves two short surveys and a one-time, face-to-face interview, approximately one hour and 15 minutes in duration, which will take place in private meeting space within the School of Public Health and Health Systems. I understand that I can refrain from answering any of the questions on the surveys or during the interview. I am aware that only the student investigator and the members of the research team will have access to the information that I provide in the interview, although my identity will remain confidential. I understand that the records of the online screening survey, demographic and health survey, and interview will be destroyed after seven years. I understand that there are minimal risks anticipated to me as a participant in this study.

This study has been reviewed by, and received ethics clearance through a University of Waterloo Research Ethics Committee

Please check the boxes if you agree with the following statements:

- I consent to the use of my responses during the face-to-face interview in the student investigator's final reports. I understand that my answers to open-ended questions may be included as anonymous quotes in this final report.
- I consent to the audio recording of my responses during the face-to-face interview.
- With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

Participant Name: _____ Date: _____

Participant Signature: _____

Witness Signature: _____

Merryn Maynard

Student Investigator
School of Public Health and Health Systems
Faculty of Applied Health Sciences
University of Waterloo
E-mail : msmaynar@uwaterloo.ca

Project Supervisor

Dr. Sharon Kirkpatrick
School of Public Health and Health Systems
Faculty of Applied Health Sciences
University of Waterloo
E-mail : sharon.kirkpatrick@uwaterloo.ca

Appendix G: Participant characteristics

Table 3: Participant responses to the 3-part USDA food sufficiency screening question

Ref #	Q1	Not enough \$ for food	Not enough time to grocery shop or cook	Too hard to get to the store	On a (special) diet	No working stove available	Not available to cook or eat because of health problems	Kinds of foods I want not available
1	Sometimes not enough to eat	Yes	Yes	No	No	No	No	/
2	Enough, but not always the kinds of foods I want	Yes	Yes	Yes	Yes	/	/	Yes
3	Sometimes not enough to eat	Yes	Yes	No	DK	No	No	/
4	Often not enough to eat	Yes	Yes	Yes	No	No	No	/
5	Sometimes not enough to eat	Yes	Yes	Yes	No	No	No	/
6	Enough, but not always the kinds of foods I want	Yes	No	Yes	No	/	/	No
7	Sometimes not enough to eat	Yes	Yes	No	No	No	No	/
8	Sometimes not enough to eat	Yes	No	No	No	No	No	/
9	Sometimes not enough to eat	Yes	No	No	No	No	No	/
10	Often not enough to eat	Yes	Yes	Yes	No	No	No	/
12	Sometimes not enough to eat	Yes	Yes	Yes	No	No	No	/
13	Sometimes not enough to eat	Yes	No	No	No	No	No	/
14	Often not enough to eat	Yes	Yes	Yes	No	No	No	/

Table 5: Participants' general health

Ref #	General health	Physical health	Mental health	Trouble sleeping	Stress
1	Good	Fair	Fair	Sometimes	A bit stressful
2	Fair	Fair	Fair	Never	Quite stressful
3	Fair	Fair	Good	Sometimes	Quite stressful
4	Fair	Poor	Good	Most of the time	Quite stressful

5	Good	Poor	Good	Sometimes	Quite stressful
6	Very Good	Very Good	Good	Sometimes	A bit stressful
7	Very Good	Fair	Very Good	Never	Quite stressful
8	Very Good	Very Good	Good	Most of the time	A bit stressful
9	Good	Fair	Fair	Sometimes	A bit stressful
10	Good	Good	Good	Sometimes	A bit stressful
12	Fair	Poor	Good	Sometimes	Quite stressful
13	Good	Good	Good	A little of the time	Not that stressful
14	Very Good	Good	Good	Sometimes	Quite stressful
15	Good	Fair	Very Good	Sometimes	Not that stressful

Appendix H: Demographic and health survey

1. What is your gender?
 - Male
 - Female
 - Other

2. What is your age? : _____

3. What is your current year of study? (i.e. 2A): _____

4. Are you enrolled in a co-op program at the University of Waterloo?
 - Yes, I am in a co-op stream
 - No, I am not in a co-op stream (regular program)

5. Are you an international student?
 - Yes
 - No

6. From which sources do you receive financial support during university? (check all that apply)
 - Government student loan (i.e. OSAP)
 - Student line of credit (i.e. through a private bank)
 - Personal savings
 - Financial support from family
 - Full-time employment
 - Part-time employment
 - Other: _____

7. What is your living situation during the academic year?
 - I live alone
 - I live with roommates
 - I live with a partner

- I live with a partner and/or children
- Other: _____

8. If you live with adult roommates, are some/all of them also university/college students?

- Yes
- No

9. Do you share basic household costs with other adults in the household, such as utilities, groceries, and rent? (Check the appropriate box):

- Yes
- No

10. If you answered yes to question 9, please explain how these costs are shared between the adults in your household:

11. Have you ever visited the Feds Campus Food Bank to obtain food during your time as a University of Waterloo student?

- Yes
- No

12. In general, would you say your health is:

- Excellent
- Very Good
- Good
- Fair
- Poor

13. Now thinking about your physical health in particular, would you say it is:

- Excellent
- Very Good
- Good
- Fair
- Poor

14. Now thinking about your mental health in particular, would you say it is:

- Excellent
- Very Good

- Good
- Fair
- Poor

15. How often do you have trouble sleeping?

- Never
- A little of the time
- Sometimes
- Most of the time
- Always

16. Thinking about the amount of stress in your life, would you say that the average day is:

- Not stressful at all
- Not that stressful
- A bit stressful
- Quite stressful
- Extremely stressful

Appendix I: Interview Guide

Ask the participant if they consent to me turning on the recording device

“Hello and thank you for volunteering your time for this study. Over the next hour, I will be talking to you about your experiences with food access as a university student. I will ask you some questions to get our discussion started and to follow up on the points we discuss. Please answer as honestly as you can and feel free to take your time to respond. I will be recording the interview and might take a few notes on my notepad as we go. As we discussed when you signed the consent form, your identity will remain confidential, meaning I will not share any of your identifying information with anyone. However, the transcript from your interview may be shared with members of the research team and I may use quotes from your interview in reports and presentations on this study. Anonymous quotes will only be used with your permission. Please remember, you can choose to withdraw from the interview at any time. If you’re ready, we’ll get started.”

	Type of Question	Question	Probe	Aim/Objective
1.	Icebreaker	What is your favourite meal to cook or eat?		
2.	Transition Question	What types of foods do you enjoy eating?	- Can you tell me more about why you enjoy these foods and what they mean to you?	
3.	Main Question	As a student, what does ‘having enough food’ mean to you?	- Quality of foods? - Amount?	- Aim 1, Objective 1
4.	Main Question	Can you tell me about a time since you’ve been a student when you didn’t have access to enough food or the food that you wanted?	- Make reference to the screening survey	- Aim 1, Objective 1
5.	Main Question	When you think about that/those times, can you think about the situations that contributed to it/them? In other words, what was going on for you that made it difficult for you to get the amounts and/or types of foods you wanted and needed?	- What do you typically do to make ends meet? - Can you tell me more about that?	- Aim 1, Objective 1 - Aim 3, Objective 4

6.	Follow-up Question	Are there other factors that sometimes prevent you from having enough food or the types of food you like and want besides money?	<ul style="list-style-type: none"> - What gets in the way of you having enough food to eat or the foods that you want and need? - On or off campus? 	- Aim 3, Objective 4
7.	Main Question	I'd like to talk to you more about the kinds of things you might do when you are running out of money for food. Can you tell me about some of the things you might do/did when you ran out of food?	<ul style="list-style-type: none"> - Where do you go to get food? - Who do you talk to? 	- Aim 2, Objective 2
8.	Main Question	(Review Demographic Survey) You stated on the survey that you [have/have not] visited the Feds Food Bank. If you have, what was that like? If you have not, are there particular reasons why not?	<ul style="list-style-type: none"> - Can you tell me more about that? Why did you visit the FSFB? - Have you used any other food banks in the region? 	- Aim 2, Objective 3
9.	Main Question	As a student, what are some of the priorities in your life that you need to balance?		- Aim 4, Objective 5
10.	Follow-up Question	How does it feel when you run out of money for food in the midst of these other priorities?	<ul style="list-style-type: none"> - What about your school responsibilities? 	- Aim 4, Objective 5
11.	Main Question	From your perspective, what do you think is the relationship between food and health?	<ul style="list-style-type: none"> - How might one's health, physical or emotional, be related to one's access to food? - How does that relate to you/your situation? 	- Aim 4, Objective 5
12.	Main Question	We've been talking about food access. Can you tell me some of your thoughts about food, and how it relates to how you feel?	<ul style="list-style-type: none"> - Is it a priority for you? Why? 	<ul style="list-style-type: none"> - Aim 1, Objective 1 - Aim 4, Objective 5
13.	Main Question	Now, I want to focus on changing things so that students don't have to worry about having enough money for the kinds of foods you like. What do you think needs to change for that to happen?	<ul style="list-style-type: none"> - Who needs to make these changes? - Students? University? Government? 	- Aim 5, Objective 6

Appendix J: Permission to re-contact form

Permission to Re-Contact

To ensure that the findings of this study accurately represent your experiences, I will be conducting follow-up telephone conversations with participants. With your permission, I would like to contact you sometime over the next six months to have a conversation with you regarding my final results. This conversation will refer only to the study you have consented to participate in, titled "The Experience of Food Insecurity Among Post-Secondary Students: A Qualitative Investigation". If you agree to be contacted, you are not obligated to take part in a telephone conversation with me. Your name and contact information will only be available to my research committee members and myself.

I agree to be contacted for a follow-up telephone conversation by the student investigator, Merryn Maynard, regarding the results of the study "The Experience of Food Insecurity Among Post-Secondary Students: A Qualitative Investigation". I understand that this agreement does not obligate me to take part in a telephone conversation and that I can ask for my contact information to be deleted at any time.

Name: _____

Telephone #: _____

E-mail Address: _____

Best Time to be Contacted: _____

Appendix K: Feedback letter

Food Insecurity among Undergraduate Students at the University of Waterloo

What was this research about?

- In late 2015 and early 2016, interviews were conducted with University of Waterloo undergraduate students to learn about food access among students.
- We were interested in finding out about the situations that might lead to students not having enough to eat or the types of foods they would like, perceived implications for health and well-being, and ideas for promoting food access among students.

Highlights of study findings:

- Both quantity and quality of food were identified as important to students' food security. Food shortages occurred as a result of shortfalls in finances, despite efforts on the part of students to ensure that they could get by without going hungry. Students also discussed eating cheap or poor quality foods when money was tight. This often happened at the end of the semester as resources ran out.
- Participants spoke of feeling preoccupied with food and with ensuring that they had enough food or money for food. This was on top of other stresses they faced as full-time students.
- Although many students relied on financial support from their families, they indicated a desire to be independent. As a result, accepting support from their families could be an added source of stress, especially when they knew their families had competing expenses.
- Other barriers that complicated food access included foods available both on and off-campus, limited confidence in cooking and budgeting skills, and time pressures.
- Strategies to obtain food or money for food included accessing free meals at campus events, sharing food with friends or family, and finding new opportunities to earn money. Some students used the campus food bank in times of shortages.
- When discussing the implications of disruptions to their food access, students reported that food insecurity contributed to stress and difficulty focussing at school, and also affected them socially by making it difficult to participate in social activities.

What happens next?

- Suggestions for improving food security from students included improving financial security by addressing issues such as rising tuition and the adequacy of financial assistance, as well as improving the food environment on campus so that students can access affordable, healthy foods.
- We are currently working to share our findings on campus and more broadly in partnership with Meal Exchange, a non-profit organization working on food issues on Canadian campuses. Together, we will work to start a much-needed conversation about student food insecurity.

This study received ethics clearance from a University of Waterloo Research Ethics Committee. If you have any comments or concerns, please contact Merryn or Dr. Kirkpatrick. You are also welcome to contact Dr. Maureen Nummelin in the Office of Research Ethics at 1-519-888-4567, Ext. 36005 or maureen.nummelin@uwaterloo.ca.

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Appendix L: HFSSM-Adult

USDA Household Food Security Survey Module (HFSSM), Adult Scale

Optional USDA Food Sufficiency Question/Screeners: Question HH1 (*This question is optional. It is not used to calculate the Adult Food Security Scale. It may be used in conjunction with income as a preliminary screener to reduce respondent burden for high income households.*)

HH1. [IF ONE PERSON IN HOUSEHOLD, USE "I" IN PARENTHEICALS, OTHERWISE, USE "WE."] Which of these statements best describes the food eaten in your household in the last 12 months: —enough of the kinds of food (I/we) want to eat; —enough, but not always the kinds of food (I/we) want; —sometimes not enough to eat; or, —often not enough to eat?

1. Enough of the kinds of food we want to eat
2. Enough but not always the kinds of food we want
3. Sometimes not enough to eat
4. Often not enough to eat
5. Don't know or refused to answer

Household Stage 1: *Questions HH2-HH4 (asked of all households; begin scale items). [IF SINGLE ADULT IN HOUSEHOLD, USE "I," "MY," AND "YOU" IN PARENTHEICALS; OTHERWISE, USE "WE," "OUR," AND "YOUR HOUSEHOLD."]*

“Now I’m going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month).”

HH2. “The first statement is “(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more.” Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?”

1. Often true
2. Sometimes true
3. Never true
4. Don't know / refused to answer

HH3. ““The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.’ Was that often, sometimes, or never true for (you/your household) in the last 12 months?”

1. Often true
2. Sometimes true

3. Never true
4. Don't know / refused to answer

HH4. "(I/we) couldn't afford to eat balanced meals.' Was that often, sometimes, or never true for (you/your household) in the last 12 months?"

1. Often true
2. Sometimes true
3. Never true
4. Don't know / refused to answer

Screener for Stage 2 Adult-Referenced Questions: If affirmative response (i.e., "often true" or "sometimes true") to one or more of Questions HH2-HH4, OR, response [3] or [4] to question HH1 (if administered), then continue to Adult Stage 2; otherwise skip to End of Adult Food Security Module.

Adult Stage 2: Questions AD1-AD4 (asked of households passing the screener for Stage 2 adult-referenced questions).

AD1. "In the last 12 months, since last (name of current month), did (you/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 (Skip AD1a)

Don't Know (Skip AD1a)

AD1a. [IF YES ABOVE, ASK] "In the last 30 days, how many days did this happen?"

_____ days

Don't Know

AD2. "In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?"

Yes

No

Don't Know

AD3. "In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?"

Yes

No

Don't Know

AD4. "In the last 12 months, did you lose weight because there wasn't enough money for food?"

Yes

No

Don't Know

Screener for Stage 3 Adult-Referenced Questions: If affirmative response to one or more of questions AD1 through AD4, then continue to Adult Stage 3; otherwise, skip to End of Adult Food Security Module.

Adult Stage 3: Questions AD5-AD5a (asked of households passing screener for Stage 3 adult-referenced questions).

AD5. "In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?"

Yes

No (Skip AD5a)

Don't Know (Skip AD5a)

AD5a. [IF YES ABOVE, ASK] "In the last 30 days, how many days did this happen?"

_____ days

Don't Know

Appendix M: Telephone script and HFSSM-Adult

“Hello and thank you again for volunteering your time for this study on student food access at the University of Waterloo. Over the next five minutes, I will be asking you a few questions about the food situation within your household over the last 12 months. Please answer as honestly as you can and feel free to take your time to respond. I will be noting your responses on a paper document as we go. As we discussed when you signed the consent form, your identity is confidential, meaning I will not share any of your identifying information with anyone. However, your responses to some of the questions during this telephone call may be shared with members of the research team. By consenting to participate in this telephone call, you are acknowledging that your anonymous quotes may be used in final reports. Please remember, you can choose to withdraw from the interview at any time, by informing me of your decision. If you’re ready, we’ll get started.”

Household Stage 1: Questions HH2-HH4 (asked of all households; begin scale items). [IF SINGLE ADULT IN HOUSEHOLD, USE "I," "MY," AND "YOU" IN PARENTHETICALS; OTHERWISE, USE "WE," "OUR," AND "YOUR HOUSEHOLD."]

“Now I’m going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month).”

HH2. “The first statement is “(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more.” Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?”

5. Often true
6. Sometimes true
7. Never true
8. Don't know / refused to answer

HH3. “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.’ Was that often, sometimes, or never true for (you/your household) in the last 12 months?”

- 5. Often true
- 6. Sometimes true
- 7. Never true
- 8. Don't know / refused to answer

HH4. "(I/we) couldn't afford to eat balanced meals.' Was that often, sometimes, or never true for (you/your household) in the last 12 months?"

- 5. Often true
- 6. Sometimes true
- 7. Never true
- 8. Don't know / refused to answer

Screener for Stage 2 Adult-Referenced Questions: If affirmative response (i.e., "often true" or "sometimes true") to one or more of Questions HH2-HH4, OR, response [3] or [4] to question HH1 (if administered), then continue to Adult Stage 2; otherwise skip to End of Adult Food Security Module.

Adult Stage 2: Questions AD1-AD4 (asked of households passing the screener for Stage 2 adult-referenced questions).

AD1. "In the last 12 months, since last (name of current month), did (you/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 (Skip AD1a)
- Don't Know (Skip AD1a)

AD1a. [IF YES ABOVE, ASK] "In the last 30 days, how many days did this happen?"

_____ days

- Don't Know

AD2. "In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?"

- Yes
- No
- Don't Know

AD3. "In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?"

Yes

No

Don't Know

AD4. "In the last 12 months, did you lose weight because there wasn't enough money for food?"

Yes

No

Don't Know

Screener for Stage 3 Adult-Referenced Questions: If affirmative response to one or more of questions AD1 through AD4, then continue to Adult Stage 3; otherwise, skip to End of Adult Food Security Module.

Adult Stage 3: Questions AD5-AD5a (asked of households passing screener for Stage 3 adult-referenced questions).

AD5. "In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?"

Yes

No (Skip AD5a)

Don't Know (Skip AD5a)

AD5a. *[IF YES ABOVE, ASK]* "In the last 30 days, how many days did this happen?"

_____ days

Don't Know

End of module

"Thank you again for taking the time to have this phone call with me. Do you have any questions?"

End of telephone call

Appendix N: Reflexive journal

4-Jan-16	<p>After consultation with Sam, BE CAREFUL with leading questions or close-ended questions. Use more open ended probing questions, for example, in question 9 ask "how does this affect you in your daily life?". In addition, I've found that prompting the participant about their responses to the FI question on the online screener helps them to answer question 4 in relation to 'not enough money for food'</p>
12-Jan-16	<p>I have been open coding for about a week now, and have almost completed 001 and 002 transcripts. So far, I have been drawing upon what I learned from my qualitative methods course with regard to coding; I have begun open coding. This is what I had originally proposed to do in my analysis section, with the thought that I would go through each transcript thoroughly, tagging segments of text without any thought to my conceptual framework. After open coding, I planned to go through these initial codes with my conceptual framework in mind, to determine whether these codes fit within the conceptual framework. However, I have found it challenging to open code the transcripts without thinking about the conceptual framework. It occurred to me that many of my questions were developed based around this framework, and thus the coding of ppts responses naturally align with some of the concepts. After discussion with Sam, we decided that it was perfectly fine for me to open code my transcripts with the framework in mind, although I need to be open to codes that fall outside of this framework. Based on the structure that has been imposed on my interviewing based on the interview questions/conceptual framework, I will attempt to structurally code my transcripts AS WELL AS content coding, to discern where certain questions are asked and answered. At this point, I have chosen to consult Guest et al. (Applied Thematic Analysis) for some guidance on my initial coding/text segmentation/structural coding.</p> <p>In addition, I had tried to start open coding without looking at my aims and objectives. I found it INCREDIBLY helpful to have the aims and objectives beside me as I was coding. Guest et al. states that "the analytic objectives [...] will always frame how the text is viewed and ultimately determine which themes are worth the effort of tagging, defining, and coding [...] reread the data with an eye towards addressing those objectives" (p.65).</p> <p>After developing structural codes for each of my interview questions, I've decided to alter question 11 and use the probe as the main question, instead of the current main question which is "From your perspective, what is the relationship between food and health?". Upon reading the transcripts, I've found that the participants are not answering this question in relation to themselves; they are not drawing the connection between their own food access and their own health. The probe for this question may illicit the type of response I'm looking for, as it is worded "How might one's health, physical or emotional, be related to one's access to food?"</p>
14-Jan-16	<p>Having some trouble with finding the meaning in the text.. I feel as though I'm just reiterating what the participant says while open coding, not truly examining what they're saying.</p>

26-Jan-16	<p>I have been coding with Nvivo for about a week and a half now, and I'm now onto transcript 005. Coding with Nvivo has been so much easier than coding on Word! It has allowed me to organize my thoughts and return to prevalent themes/codes. My meeting with Sam was also useful; sometimes it's okay to reiterate what the participant has just said...that may provide the best context/wording for that particular code. As I go through the interviews, these seemingly surface level codes will get compiled into categories, upon which I can form more abstract themes. Don't rush the process! In addition, I have returned to more of an 'open coding' style with my transcripts in NVivo... going through them with the conceptual framework in mind is concerning, in that I don't want to exclude or inappropriately code anything because I'm trying to fit it into one of the concepts in the framework. I need to be open and receptive to concepts that fall outside of the framework. After open coding all of the transcripts, I plan to go through these codes and consolidate, and compare with the conceptual framework to see where things deviate/are the same. On Sharon's suggestion, I am going through some of the 'big papers' in qualitative FI research to see how they describe their analysis process. I HAVE CHOSEN TO SEGMENT TEXT BASED ON THE BEGINNINGS/ENDINGS OF A THOUGHT.</p>
09-Feb-16	<p>Almost finished coding the first seven interviews; still waiting on ethics clearance for the addition of the HFSSM. Had a meeting with Sam today to check in on my progress. She took a look at my open coding process, and said I'm on the right track! I need to continue to open code the interviews, and start to aggregate them when I've interviewed a few more people. Next step in the analysis process will be to compare the aggregated codes to the concepts in Alaimo's framework, and determine where they fit in/if concepts fall outside of the framework. I've already started to do this implicitly, in that there are some areas I want to follow-up and probe for in the coming interviews (i.e. attitudes towards the use of the FSFB). This fits in with my original analysis plan, in which I proposed to use adaptive theory (using a combination of inductive and deductive coding with an existing conceptual framework). At that stage, I can begin to form my final set of themes and concepts, and it will become easier to draw relationships between concepts. Now that I've done basic conceptual coding, I will go back through each interview and be more attentive to participant perspectives and case coding. I plan on arranging a meeting with Sharon, Sam, and Chris to give them some examples of my coding process. I hope that this will help us all stay on the same page. In addition, I took Sharon's advice and went through some popular qualitative FI articles to see how they conducted their analysis. Although there is a wide variety of strategies and labels for these strategies, what many of them have in common is the combination of an inductive approach (i.e. grounded theory) and a deductive approach (i.e. use of existing literature and concepts). This is reassuring, as I am following in the footsteps of what other researchers are doing!</p>
12-Feb-16	<p>Had my second peer debriefing session with Alana. I went through some of the more prominent codes with her, and showed her my process of coding. I mentioned I was concerned about the structure of my coding steps, and she suggested starting to write out my methods section for my defence document, to ensure I don't forget anything. In addition, I finally received ethics clearance today, so I will resume recruitment through the food bank next week!</p>
22-Feb-16	<p>I officially began re-interviewing participants last Friday, and I re-contacted my prior participants by email this morning, requesting a telephone call.</p>
08-Mar-16	<p>I'm having trouble with probing again! Although I'm getting better at asking open ended probes, sometimes participants are unwilling to open up. I feel as though there's only so many ways I can ask a question before it becomes annoying... I spoke with Sam, and she said sometimes people just don't want to share, and not to take it personally/chalk it up to poor interviewing skills. Following my committee meeting last week, we decided to pick back up on recruiting through on-campus flyers. Flyers are now in BMH, and will go into SLC later today.</p>

18-Mar-16	FRUSTRATING when participants who indicate financial insufficiency on the screening survey show up to the interview, and it's clear that they just don't know how to budget their money... Definitely indicates that our traditional methods of measuring FI may not be appropriate for this pop'n! Interviewed a participant who fulfilled an exclusion criterion, so I can exclude her... but it's irritating.
19-Mar-16	After open coding my 9th interview, I feel as though there are a few topics I need to investigate further in future interviews: <ul style="list-style-type: none"> - When asking the health and food connection question, make sure to ask how the participant feels that connection relates to their own situation with food access - Try to probe for thoughts around on-campus foods - If the participant makes comments about how "all students" do a certain thing or feel a certain way, follow up! - If the participant is a FSFB user, probe for experience beyond surface-level stuff... "why did you feel you needed to visit the FSFB?" "What are some of your thoughts about your experience at the FSFB?" "Why might someone not want to use the FSFB?"
11-Apr-16	Over the past 3 weeks, I've interviewed more participants and added the probes indicated above. I've had a meeting with Sam to show her my preliminary open codes, and she approved my idea to start compiling open codes into broader categories. I started this process and moved all open codes that may/may not be relevant/do not fit into another category into an 'uncategorized codes' category. My initial categories will still need to be refined and collapsed, but I'm waiting until I open code 013 and 014 before I do this. Throughout my categorization process, I've been double checking my original open codes and linking back to coded content (constant comparative process). If things don't seem to line up, I've been altering these open codes/changing segments of text to better reflect what I think is being said. I will also be double checking all my original coding once I finish open coding. This week I plan on sending a part of a transcript and a list of codes to Alana this week for peer coding.
13-Apr-16	I have been busy assigning definitions for all the main categories and sub categories in Nvivo. This helps to clarify what the category means and what codes fall underneath it. I have taken a segment of 014 transcript and will be giving it to Alana along with a list of the main categories, sub categories, and codes I used in that segment. She will then try to code it using my provided codes, and we will then meet to discuss (subjective assessment)
15-Apr-16	I have been reading Layder more in depth, and decided to formalize my process of memo writing (in NVivo) as I get really into the analysis process. I feel as though this will help me move from my preliminary categories into more theoretical themes and broader overarching relationships. Layder has recommended that this take place throughout the analysis process (and I have been good about my reflexive journaling), but I think this will prove useful from there on out.

Appendix O: Peer debriefing reports

18-Dec-2015	<ul style="list-style-type: none">- Issues with closed-ended questioning: Alana suggests that no harm in contacting participants for an additional interview, not as long, something to consider... you don't want to have a participant not count because of bad questioning.- Potential of doing interviews via telephone?- Went over 002: Alana suggested to send 002 to Sam for interpretation.
12-Feb-2016	<ul style="list-style-type: none">- Discussed initial coding process with Alana via NVivo.- Talked about code hierarchies and when is appropriate to begin this process. Alana suggested talking with Sam.

Appendix P: Inter-coder agreement documents

Section of transcript, Alana's coding:

Participant 014

M: So um, so as a student, what does having enough food mean for you?

P: Um I think like being able to feel like you're satisfied, like you're full, during like, especially like the breakfast lunch and dinner hours. And like having, like food in the fridge, or in the cupboard, like being able to have different food groups and the essentials?

M: Yeah definitely definitely. When you mentioned different food groups, does it matter that you, that there just sort of is food, or does it matter the types of foods?

P: Um sort of both, having food and having the different food groups that you need.

M: Yeah yeah definitely. Great. Perfect. Okay. So you might remember, it was probably a while ago you filled out the online screening website thing, and one of those questions asks you some reasons why you might not have the food that you want, and one of the things you said is that you might not have enough money for the foods that you want or needed. Um so can you tell me about a time since you've been a student when you didn't have access to the types of foods you want or needed?

P: Yeah well actually yesterday I just went to Sobey's after work, and I work part-time at the front desk, but like-

M: Sorry at Sobey's?

P: Uh no like in residence, like on campus, I worked at CLV so it was close to Sobey's and I was like oh it's Tuesday, I'll go see what there is cause there's a student discount for 10% off there, and all the fruit and veggies are so expensive. I think it was like 5 dollars for strawberries, and there's nothing on sale, and I was telling my friend, I guess I'll go on a grocery run today and end up coming home with just like bagels, and like a salmon kinda thing? And some candy cause I wanted it [laughs] but I didn't end up getting any real food that I really want to get, um, like my fridge is super empty right now, there's nothing in the freezer, I don't have any milk but there wasn't anything on sale and I didn't really wanna buy it when it's so expensive, and veggies and stuff was just too expensive for me to buy, so I'm hoping maybe I can find it on sale somewhere else but I haven't gotten time for it, so that's the other thing I don't have that much time to go grocery shopping, so a lot of the times I just try to make do with what I have at home, even if it's not as healthy as I want it to be? Like sometimes it would just be plain rice or plain bread if I don't have other stuff. Um and also, it's kinda like the other issue with getting food was being able to, the commute I guess to the grocery store? So like I live actually at UWP, and it's at the far end near Waterloo Park off of Seagram, like the far side of UWP, so when I go grocery

shopping we would have to take the bus at Philip, and it's actually a far walk when you come home with all the food it's like hard to carry it. And some of the buses, I know like I know I used to go to uptown because there's Valumart and shoppers beside it and you can compare prices, and um I usually go with my friend who lives downstairs, but now there's construction there so the buses, the routes are really weird and we don't really know how it works anymore, so we're trying to go to other places? That are kinda like farther but it's harder to like bring food back.

M: Mhmm, you said, do you live in residence then?

P: Yeah

M: What year are you in?

P: I'm in 3rd year.

M: Okay. So um, okay interesting, so how often, you were talking about not going to Sobey's much because it's too expensive, why, does that happen often for you?

P: Um, more often I that I don't have the time, because I have classes all the time and it's just hard to fit it into my schedule. But yeah, when I go shopping, it's hard to like buy the food that I need because it's like so expensive, and basically I just support myself almost fully, I pay for my rent, my tuition, everything, because like my parents, they, like I have a brother who's also in university, he's at McGill and like for him, he's in first year and tuition is so expensive, the rent is so much more than here as well and my parents are helping to support him because he doesn't have a job and he's never had one in high school, so I feel bad if like I need my parents to like help me out as well. So I'm trying to like be as independent as I can, but it's like food is so expensive. I actually just saw a snapchat this morning, and my friend, I don't know which grocery store she was at but she was like, after full day of shopping, like rude food prices, and it was like strawberries were 7.99, and it was like this half pint little small thing. And I was like whoa, that's awful.

M: Yeah okay very very interesting for sure. So yeah, food prices, I like that you talked a bit about having to go on the bus and trying to figure out where to go that way-

P: Yeah so in residence, they actually have a grocery shuttle on Saturdays, but we're not really sure, they like kind of have a schedule but I don't think that it's that accurate, and they don't tell you the specific times when they're leaving the grocery store, they say the shuttle will just show up kind of like around these times, so we're kind of hesitant to take it because we don't, we want to time our day out properly, we like want it to be exact but it just doesn't happen so Yeah.

M: What grocery stores did the shuttle go to, do you know?

P: I don't know, I'm not very clear on it, I think it might have been Sobey's, Sobey's or Zehr's. Like it's, one of the more expensive ones.

M: Okay that makes sense. Interesting yeah, I've heard of something like that before but I wasn't really sure how it worked. So not clear about the timing, timing wise. Great. So we've talked a little bit about a few things that make it difficult, so when you think about these times, especially when it comes to sort of the money situation just making it too expensive right now, um can you think about what kind of situation contributed to that? So what sort of has been going on for you that's made it difficult to get the money you need for food?

P: Um well mostly like, I'm just like, it's hard for me to like feel okay with spending money, like on, I dunno just on buying food that I want if it was too expensive? So that kind of contributes to not being able to purchase it? And um, like just being, having to like support myself, it kind of contributes to it, as well. Um and I know like in previous years, I used to go home a lot and my parents would just bring food over so that made it easier but now it's like, I just usually stay on campus and try to like, not rely on them as much?

M: For sure, for sure, why is that?

P: Uh, just like because they're, they have so much going on with like supporting my brother and also like, yeah. Like I think my dad has been struggling with his job as well, he's a real estate agent, so it kinda like really varies, he doesn't have a stable income so it depends like how his clients are and everything. Um, and also I applied to go on exchange in the fall so I'm trying to save up for that and I'm also trying to not like, burden my parents with that either so like yeah, that's the main thing.

Category	Subcategory 1	Subcategory 2	Code 1	Code 2
Food Security Meanings	Quantity		Three meals per day	
			Something in the fridge	
		Quality	A variety of foods	
		A feeling	Satiety	
Sample codebook for Alana:				
Coping Strategies	Financial strategies	Food budgeting	Shopping when there is a	
			Price-matching or shopping	
			Grocery shopping with friends	
	Food sharing		Parents providing food	
	Borrowing food or money for food			
Barriers and Vulnerability Factors	General barriers		Lack of time	Lack of time to buy groceries
	Financial barriers		Rising or high food costs	Healthy foods are
		Financial	Parents unable to contribute	
	Food environment	Off-campus	Location of grocery stores or Carrying groceries without a	High-end grocery stores
			Inadequate public	
		On-campus barriers	Unclear schedule for grocery shuttle	
Components of Student Food Insecurity	Eating low quality foods		Eating cheap, energy dense foods	
			Cutting back on food	
			Eating unhealthy foods	
	Running out of money for food			
	Experiencing		Feeling guilty	
	Making 'trade-offs'	Making trade-	Cutting back on food	
	Trying/wanting to be in control of the		Trying to be financially responsible	
		Not wanting to depend on family/parents for help		
Facilitators of Food Security	Already existing		Grocery shuttle for residence buildings	
Miscellaneous Codes			Living in upper year residence	
			Third year university	
			Saving up to go on an exchange abroad	

Summary of inter-coder agreement meeting with Alana, May 11/2016:

Discussion:

- Lack of time category: may be more appropriate to call this category 'time management' ... it makes it more clear that the students may think they don't have time, but they are unsure of how to manage their time properly to account for cooking, food purchasing, etc. I want to stay true to 'their' meaning of the situation (which is lack of time). Will discuss with Sharon.
- Double check the 'making trade-offs' code and the 'components' theme more broadly.
- Go through misc. codes for instances where students make food sacrifices to do other things (e.g. travel, have other experiences, etc.)
- Added coding for 'part-time job', 'buying groceries', and 'prioritization of school'
- Develop 'wanting to be in control category'. Look for a desire to be independent in other interviews

Alana caught a few instances of 'feeling' codes that I had missed (i.e. feeling guilty, feeling uncertain). Other than that, our coding pattern was almost identical (she segmented some of her codes differently, but that was mostly due to the comment function in Word).

Appendix Q: Coding memos

Nodes “Balancing priorities” and “School”	20/04/2016: Both these main categories have subcategories related to students being unable to work/experiencing difficulty with working a part-time job because of their school responsibilities... Should consider collapsing?
Combining nodes “Factors” and “Barriers”	<p>15/04/2016: Originally, I had separated out 'barriers to food security' and 'factors that contribute to food insecurity', as this is how my questions in the semi-structured interview guide had been arranged. I had asked about things that make it difficult for students to get the types of foods that they wanted/needed (barriers) and asked about what was going on for them in their lives at the time of their food insecurity (what I thought were factors). Through discussion with Sharon, and a constant back and forth between the existing categories and interview data, I've decided to combine these two categories.</p> <p>I chose to do this because the things that make it difficult to remain food secure are similar to the reasons people get there in the first place. Although the main factor or barrier is financial insufficiency, factors like the food environment and education can exacerbate financial insufficiency. I am still working through the different categories of barriers (specifically school-specific, general, and education/knowledge).</p>
Coming into and out of a food-insecure state	Seems as though a combination of factors; part-time job, visiting the food bank, purchasing cheap and instant foods, help to pull a person out of a state of FI... yet some of these factors are unrealistic for students (i.e. part time job; while this might alleviate FI to a degree, 004 in particular couldn't balance her job during midterm season)
“Components of student food insecurity” main category/theme	<p>15/04/2016: I was having difficulty labelling this particular category, so I chose to go the route of Alaimo and label it as 'components' of the student food insecurity experience. Alaimo's framework refers to four specific 'components' of food insecurity. When students were talking about things that were similar to these components, I began to group them in the same place. These components are common to experiences of food insecurity in other populations, like 'eating less or skipping meals', 'eating low quality foods'. However, there are some that are different from Alaimo's components; namely, normalization.</p> <p>18/04/2016: I decided to move the FSFB category underneath "components". This seems appropriate, as accessing/not accessing the FSFB is considered emergency food programming, which is a specific component in Alaimo's framework. This seems to make sense for now, but I may move it in the future if this becomes a broader theme!</p>
Creation of “Food literacy	15/04/2016: I had knowledge/education underneath 'general', but I realized that difficulty transitioning, limited food literacy, and poor budgeting skills were all connected by the lack of sufficient education or knowledge. Still not totally sure about 'difficulty transitioning'... This

skills" category	<p>category could point to deficiencies in knowledge, but may also be a broader theme that incorporates aspects other than 'knowledge'.</p> <p>14/05/2016: I have renamed this category "food literacy", as the education and knowledge students refer to all relate to food access (e.g. cooking skills, food budgeting skills, etc.)</p>
Meaning behind "Normalization" category	<p>15/04/2016: I'm still trying to refine this particular category. There are lots of different things included here at the moment. However, I was noticing students making comments that could be considered 'denial' of their situation, if I was examining this from a psychological point of view. Students would use humour frequently when talking about accessing free food on campus, for example. Students have also been placing their food insecurity in perspective; for example, being 'thankful' for what they have, being better off than others, etc. Some of these things might not fit here! I should consult with Sharon regarding this category.</p> <p>02/05/2016: Moved to coping strategies. After discussing with Sharon, I moved this category under coping strategies</p>
"Starving student" theme	<p>15/04/2016: Linkages between 'starving student', 'normalization', and FSFB behaviours</p> <p>The 'Starving Student' category includes student's expressions of typical student stereotypes related to food: purchasing prepared food, eating whatever is available and convenient, students having financial troubles, etc. However, I feel as though the 'Starving Student' category can be closely connected with the 'normalization' subcategory in 'components of student food insecurity', and with the 'not wanting to visit the FSFB code'. These categories have similar underpinnings, in that students are attempting to justify their food insecurity and incorporate it into broader social norms. It seems as though they are attempting to situate themselves and their own identities within the Starving Student norm, and do not associate themselves with people who are 'in need' or the 'type of person who visits a food bank'.</p> <p>20/04/2016: Starving student, need to revisit. Important to revisit the starving student categories. I had initially thought of this theme as being one that included when students spoke of common stereotypes about students... but I've included when they apply these stereotypes to themselves (i.e. a student will talk about purchasing convenience foods because they don't have time to grocery shop)</p> <p>May 2016: Starving student category has been reconfigured to be more of a 'starving student lifestyle' theme. This better encompasses when students refer to themselves, and to all students doing certain things... eating cheap convenience foods, having little time with which to access food, having limited finances, etc.</p>

Appendix R: Interview notes

Ref #	Notes
1	<ul style="list-style-type: none"> • groceries in Toronto are easier, in Waterloo she has to take the bus which takes a long time. Eats instant foods • works early shifts in the SLC • concerned with assignments, midterms and finals • needs help managing time, budgeting time • food costs: groceries and healthier foods are expensive • knowing more about food banks as a resource • Waterloo problem: student town, all stores keep prices high, they know and jack up prices. Here, we have fewer options. • Toronto has cheaper healthy food prices compared to here. Tend to buy for 2 weeks.
2	<ul style="list-style-type: none"> • wants to manage own time, not need as much • comfortable talking about issues
3	<ul style="list-style-type: none"> • Not experiencing FI at the time of the interview • Stores food and cans so he has something in the house • Drinks hot water when he has no food • Doesn't ask parents for money when he runs out, because transfers cost money • Uses survey money as a coping strategy • Too busy to get a part-time job • Seemed completely unaware of his own financial status compared to others.. may be a cultural thing
4	<ul style="list-style-type: none"> • Most people think international students are rich, which is not true • Parents wanted a better education for her • Parents can only provide money for her studies, food is extra expense • This is normal for international students • More scholarships are needed for international students, there's not many at the moment • Some food support as well, to help with cultural food purchase • Canadian government can be slow to make change
5	<ul style="list-style-type: none"> • Income shocks resulted in FI • Very quiet, needing to probe lots
6	<ul style="list-style-type: none"> • Vegetarian • Middle-class family, not used to running out of money for food

7	<ul style="list-style-type: none"> • Enjoy what's available • Time is an issue • Co-op: 4 + 4 month breakdown. Works for her to try to budget money for the next semester • Misses home-cooked food; lack of cooking skills • Doesn't visit FSFB because she isn't around the SLC much. • Very comfortable with talking
8	<ul style="list-style-type: none"> • School is getting more expensive each year, becoming a challenge
9	<ul style="list-style-type: none"> • Very uncomfortable with talking! Doesn't want to share feelings easily • Denies that FI has had any impact on him, yet talks about added stress
10	<ul style="list-style-type: none"> • Difficulty budgeting; talks of himself and friends • Food insecurity during exam time resulted in weight gain; eating cheap, energy dense foods
12	<ul style="list-style-type: none"> • Japanese/Korean foods • Uses FSFB • Skipping meals due to lack of time to cook, not due to running out of money for food • Lost weight in first year, parents mentioned it' • Going home, parents take her out for dinner and let her take home the leftovers
13	<ul style="list-style-type: none"> • Loves to cook • Talks about other degree aspirations... social work instead of engineering • Afraid of sharing financial issues with his mom; lost a father • Very talkative! Needed to get some of this out
14	<ul style="list-style-type: none"> • at the end of his degree • Needing to visit multiple food banks, not just FSFB • Reluctant to visit food banks more than necessary, counting on getting a full-time job soon • Seems hopeful about job search

