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KWAZULU-NATAL**

**INYUVESI
YAKWAZULU-NATALI**

**Vulnerability to food insecurity among students: A quantitative
study at the University of KwaZulu-Natal.**

By:

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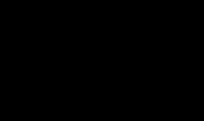
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Working on this dissertation has been a fruitful journey. Despite the challenges I encountered along the way, I have grown in so many things. All of this would not have been possible if it was not for God's Grace, which kept me going and growing in my journey. Further, the endless support from several individuals did not go unnoticed.

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Dedication

I dedicate this dissertation to the memory of my mother.

You'll always be in my heart

Abstract

The prevalence of food insecurity are reported to be high in South Africa and globally Research on food insecurity within the university student community is gaining momentum as food insecurity has been recognised as a growing issue facing students. Institutions of higher learning are a platform to improve students' lives, and in South Africa, access to higher education has been made possible for students from poor socio-economic backgrounds through the National Financial Student Aid Scheme (NSFAS). In addition to several other challenges they face, students from poor socio-economic backgrounds (e.g., those receiving NSFAS funding) also experience food insecurity as a challenge in their university studies. This study aimed to provide an updated and current exploration of food insecurity among students at the University of KwaZulu-Natal.

The study used a non-experimental survey research design to generate quantitative data. A non-probability quota and convenience sampling method was used to collect data across all five university campuses from 438 students by administering the University Students Food Insecurity Questionnaire (USFIQ). This questionnaire consists of questions exploring anxiety or uncertainty about food supply, insufficient food quality, insufficient food intake, and physical consequences of food insecurity. A vulnerability to food insecurity scale is embedded in the questionnaire and provides an average vulnerability to food insecurity score for respondents.

The results from the study suggest that the problem of food insecurity is highly prevalent among the sample of UKZN students, with 48.6% reporting often or almost always experiencing food security-related difficulties. More specifically, 36.2% of the sample reported experiencing a serious level of food insecurity, and 12.4% reported experiencing a severe level of food insecurity. The findings from the study also suggested that the dominant factors (from those listed on the questionnaire) contributing to students' vulnerability to food insecurity are other

competing study-related expenses such as stationery, books, and photocopying. Other dominant factors (among those listed on the questionnaire) that influence the experience of food insecurity among the students included finishing their meal allowances before the next one was forthcoming or the family being unable to provide enough money to the student to buy food. The questionnaire also asked study participants to identify their strategies to access food. This component of the study suggests that most students rely on asking family members for money or food. The findings from the study also indicate a significant difference in vulnerability to food insecurity when comparing students receiving financial aid with those who are not. No significant differences were found between vulnerability to food insecurity in terms of students' residence, campus, or level of hunger at the end or beginning of a semester. The findings from this study point to the need for ongoing intervention at the University of KwaZulu-Natal (and within the Department of Higher Education and Training generally) to manage the problem of food insecurity among university students. There is a need for further research to explore the effects of food insecurity among students.

Keywords: Food insecurity, Students, UKZN, Quantitative, UFSIQ, Vulnerability, Hunger, University.

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Abbreviations

ANC: African National Congress

DHET: Department of Higher Education and Training

ECA: European Commission on Agriculture

FAO: Food and Agricultural Organisation

MDG: Millennium Development Goals

STATS SA: Statistics South Africa

UKZN: University of KwaZulu-Natal

USFIQ: The University Students Food Insecurity Questionnaire

WFP: World Food Program

Chapter 1 Introduction

Access to continuous nutritious food is an integral part of every living individual and depriving one of this necessity exposes them to food insecurity. Food insecurity has become a persistent global problem, and it is estimated that in 2018 about 9.2 % of the world population were exposed to severe food insecurity (FAO, 2019). There is a worrying emergence of food insecurity amongst students in the South African university context, affecting students from low-income households (Munro et al., 2013; Sabi et al., 2020; Van den Berg & Raubenheimer, 2015). Chapter 1 introduces the background to the study presented in this dissertation and then isolates the study problem statement. The chapter then identifies the study's aims, objectives, and questions. The chapter concludes with an overview of the structure of the dissertation

1.1 Study background and problem statement

Food insecurity exists when there is limited or no access to food in terms of both quality and quantity (FAO, 2019). A recent report by the Food and Agriculture Organisation of the United States (FAO) introduces an indicator that looks at food insecurity in comprehensive dimensions, dividing the problem into three classes: food insecure or marginally insecure, moderately insecure, and severely insecure. According to this report, people experiencing moderate food insecurity encounter uncertainties regarding access. Those circumstances sometimes compel them to reduce the quality and quantity of food they consume (FAO, 2019). On the other hand, those experiencing severe food insecurity are likely to have run out of food, experienced hunger, and may have gone for days without eating (FAO, 2019). Henry (2017) asserted that; it is crucial for studies exploring food security prevalence to understand these dimensions of measuring food insecurity.

In 2017, Statistics South Africa (Stats SA) revealed that 78.7% of households had adequate access to nutritious food, while 15.8% reported inadequate food access. According to Stats SA (2019), a further 5.5% was said to be food insecure. According to Waidler & Devereux (2019) changes to household income has contributed to food insecurity in South Africa. However, a slow reduction of food insecurity and poverty rates has been reported over the past few years and is associated with the effects of social grants to South Africans (Waidler & Devereux, 2019)

Food is a basic need that everyone should have access to daily. The problem of food insecurity in South African higher education institutions has been a threat for a while. Some of the highlighted factors contributing to food insecurity are social and economic backgrounds, income and financial mismanagement, food theft, and inadequate nutrition and health (Sabi et al., 2018). Although democratic South Africa has put much effort into ensuring that education is accessible to all and is a basic right for every individual, exercising this right has been challenging, especially for those experiencing food insecurity. According to Bruening, van Woerden, Todd, and Laska (2018), food insecurity has potential adverse effects that may affect the student's mental functioning, resulting in poor academic performance.

Though there have been attempts to research and address the problem of food insecurity within the country, confidence cannot be established as the area is still under-researched. Recent studies conducted in higher education institutions emphasize the importance of ensuring that students in higher education should have access to basic needs such as food, shelter, and clothing for them to succeed academically (Munro, Quayle, Simpson, & Barnsely, 2013; Van den Berg & Raubenheimer, 2015). A study conducted at the University of KwaZulu-Natal (UKZN) between 2007-2009 which administered the University Students Food Insecurity Questionnaire (USFIQ) to students from mainstream degree programmes found that 4.3% of the population studied reported experiencing severe vulnerability to food insecurity, whereas 0.4% were categorized as experiencing critical levels of vulnerability to food insecurity (Munro et al., 2013). In response to this phenomenon, the institution introduced a programme

that aims to address and respond to the issue of food insecurity among students (Munro et al., 2013), however, the current status of this programme is unknown.

Van den Berg and Raubenheimer (2015) noted that the development of society will face long-term challenges if food insecurity persists, impacting a student's ability to study and graduate. Food insecurity is a global problem and is, therefore, the moral duty of politicians, senior management of institutions of higher learning and corporates, academics, students, and all those in possession of resources to alleviate and address food insecurity with a strong emphasis on sustainability amongst vulnerable populations including the important student population (Rudolph et al., 2018).

The study aimed to replicate a previous study that explored food insecurity amongst university students at the University of KwaZulu-Natal Pietermaritzburg campus (Munro et al., 2013). The current study investigated the problem across other campuses within the University of KwaZulu-Natal (Pietermaritzburg, Westville, Nelson Mandela School of Medicine, Howard College, and Edgewood). The findings presented in this dissertation may assist in providing updated information on the extent of vulnerability to food insecurity among the UKZN student population and creating awareness around food insecurity in the institution and the likely threat it poses to students' academic success.

The objectives of this study were:

1. To provide a current measure of vulnerability to food insecurity among students at all the UKZN campuses.
2. To explore the reasons that contribute to UKZN students' food insecurity.
3. To identify students' suggestions regarding what UKZN could do to respond to food insecurity among its students.

1.2 Research questions

The questions that guided this research study were:

1. How vulnerable are UKZN students to food insecurity?
 - a. Are UKZN students more likely to be hungry at the end of a semester (near exams) than at the beginning of a semester?
 - b. Is there a difference in vulnerability to food insecurity between students on different UKZN campuses?
 - c. Are UKZN students on NSFAS more vulnerable to food insecurity than students on other forms of funding?
 - d. Is there a relationship between where a student resides during the semester and their vulnerability to food insecurity?
2. What are the reasons UKZN students identify as contributing to their food insecurity?
3. What suggestions do UKZN students have for the way in which the institution could respond to the incidence of food insecurity among its students?

1.3 Dissertation overview

The study reported in this dissertation sought to explore the problem of food insecurity among students at the University of KwaZulu-Natal. The first chapter presents an overview of the background and significance of the study, the aims and objectives and lastly, research questions for the study. The second chapter incorporates relevant literature on food insecurity and vulnerability to food insecurity in tertiary institutions globally and locally. The third chapter focuses on the methodology employed when undertaking this research study. The methodology chapter provides an overview of the procedures before the study commenced, through recruitment and the data collection process, and the analysis procedure. The fourth chapter presents the study results providing statistical reports of the collected data. The fifth chapter discusses the results incorporating the theoretical framework that framed this research study.

The final chapter concludes the research study, summarises all the critical information and ends with limitations and suggestions for future research.

Chapter 2 Literature Review

2.1 Introduction

Food insecurity has been a global crisis for decades. Since the 1960s, countries like the United States of America recognized the global food insecurity crisis and introduced different initiatives to try and alleviate it (National Research Council, 2006). Chapter 2 reviews a wide range of literature exploring food insecurity on a global and national scale. It highlights significant issues that have been highlighted by existing literature. Furthermore, it outlines how this research study aims to contribute towards the body of knowledge within the topic of discussion.

Firstly, it looks at the historical background of food insecurity. Secondly, it provides a conceptual definition of food insecurity. Further, this chapter reviews some factors contributing to food insecurity. Fourthly, it will review the issue of food insecurity in South Africa and its impact on different households. Given the study's focus on food insecurity amongst university students, the specific manifestation of this will also be explored. Lastly, the major initiatives undertaken to address the issue of food insecurity are highlighted.

This study draws on Amartya Sen's entitlement approach, which argues that food insecurity results from people not having enough command over food (Sen, 1981). The principles of this approach focus on people's right to command food by lawful means available in society, such as production opportunities, trade opportunities, entitlements against the state, and other methods of obtaining food. An individual may starve if he cannot command enough food or fails to use this ability to escape starvation (Sen, 1981).

2.2 The historical context of food insecurity

Global initiatives such as the World Bank highlighted a goal of ensuring that the condition of food insecurity is mitigated by 2030, and the countries of the United

Nations further committed to the importance of dealing with this continually increasing phenomenon (FAO, IFD, UNICEF, WFP and WHO, 2021). Despite efforts to address the poverty crisis by 2030, however, there has been an increase in people living in poverty and experiencing related food insecurity to which COVID-19 also had an impact (FAO, IFD, UNICEF, WFP and WHO, 2021)

Global estimates report that approximately 811 million people are below the poverty line, and in Africa, there is a growing number of hungry people (FAO, IFD, UNICEF, WFP, and WHO, 2021). A poverty line is defined as a monetary threshold below which someone is considered poor (Lehohla, 2008). The struggle to access adequate and nutritious food has led to nearly 2 billion people being severely or moderately food insecure (FAO et al., 2020). A report by the FAO and the European Commission on Agriculture (ECA) highlighted that the challenging economic situations in Africa have worsened the crisis of food insecurity in the region, and 257 million people were reported to be food insecure (FAO, ECA, 2018). Western and Eastern Africa have a high population of people living in poverty and food insecure (FAO and ECA, 2018).

Ongoing economic challenges, large-scale unemployment, and high levels of income inequality in South Africa continue to contribute to the increasing number of South Africans living in poverty (Stats SA, 2019). Literature posits that the apartheid regime significantly contributed to the high levels of poverty in post-apartheid South Africa (Bhorat & Kanbur, 2006). In 2015 about 25.2% of the population lived below the poverty line, which was a decline from 2006 (Stats SA, 2019). Statistics South Africa conducted a community survey in 2016, which asked households to indicate how often they ran out of money to buy food or skipped a meal (Stats SA, 2016). The survey reported that about 19.9% of the households reported running out of money to buy food in the previous 12 months (Stats SA, 2016). However, the survey also reported a decline from 16.7% to 13.3% in 2016 in the number of households who skipped a meal (Stats SA, 2016). Economic inequality remains a contributing factor to food insecurity in

South Africa, with a household in the lowest income categories being affected by the increase in poverty levels compared to the households in high economic categories and COVID-19 has made this fact more evident (Bhorat & Kanbur, 2006, Odunitan-Wayas et al., 2021).

2.3 Defining food insecurity

As mentioned herein, food insecurity is a long-existing phenomenon, and there have been several scholars attempting to introduce a clear conceptualization of food security and food insecurity (National Research Council, 2006). This section will attempt to collate the most frequently used definitions.

2.4 Food security

Food security is defined as when everyone, at all times, can physically and economically access food that is safe and nutritious and meets their everyday dietary needs and food preferences for a healthy life (FAO, 2019). According to the National Research Council (2006), food security includes the availability of nutritionally adequate and safe foods and an assured ability to acquire acceptable foods in socially acceptable ways. This commonly used concept was introduced and agreed upon at the 1996 World Food Summit, and the concept is said to rest on the following pillars: availability, access, utilization, and stability (Sabi et al., 2020)

2.4.1 Availability

Availability is the first pillar of food security, and it refers to the supply of food “determined by the level of food production, stock levels, and net trade.” (FAO, 2008 p. 3). Food availability is considered an essential factor in ensuring a sustainable food security system (Bach & Aborisade, 2014). Since the 18th century, advanced agricultural production has played a vital role in increasing food availability across different countries globally; however, challenging economic instabilities make it difficult for this pillar to be maintained appropriately (Barrett, 2002, 2010). Resulting from the economic challenges, Lutz, Scherbov, Alexia, Dworak, and

Gustav (2002) postulate that the decline in food availability is caused by increasing population, poverty, education, and inequalities. Considering food availability, it should be noted that healthy and nutritious food must be available and should be socially and culturally acceptable. As much as availability is essential, it may not ensure access to sufficient, healthy, and nutritious food for meeting society's food preferences (Barrett, 2010; Pinstrip-Andersen, 2009). Enough food availability at the national and international levels does not guarantee the household level of food security (FAO, 2008).

2.4.2 Access

The second pillar of food security is access. According to Barrett (2010), it is closely related to individual and household well-being, which incorporates people's choices considering their income, prevailing food prices, and safety channels to access food. Access is a crucial aspect that needs to be addressed when measuring food security at the individual and household level. According to the WFP (2009), food access indicators mainly focus on social and economic characteristics at the household level and how the household relates with the markets and income distribution (i.e., prices, cash crops, and livestock). According to Godfray et al. (2010), "Patterns in global food prices are indicators of trends in the availability of food, at least for those who can afford it and have access to world markets." (p.01)

Barrett (2002) argued that food security goes beyond accessing sufficient quantities and quality of food and depends on access to other complementary inputs like education, health, sanitation, and water, which affect the efficiency of converting consumed food into physical well-being. Further, the author pinpoints that the access pillar highlights issues in responding to adverse shocks such as unemployment, price spikes, or loss of livelihood-producing assets. In that view, one can observe the disenfranchisement related to food security, poverty, socio-economic factors, and politics (Barrett, 2002, 2010). Food is necessary for everyone to have sufficient access to survive and be an active and productive part of society. Households always ensure

they have enough available access to food despite their affordability (Barrett, 2002). These households manage stocks and flow of assets and money to meet the basic needs, ease shocks and meet emergencies (National Research Council, 2006). An example provided by Wolfe, Frongillo, and Valois (2003) is that people may consume less food in the present to make sure they have some left for the future or engage in trade-offs to buy other essential items such as medication.

2.4.3 Utilization

Utilization refers to how the body makes use of the nutrients it absorbs, and food safety and quality are important contributing factors. Barrett (2010) refers to utilization as making good use of the food you have access to. It is crucial to consume food with sufficient nutrients needed by the body (Barrett, 2002). A healthy physical environment is important in this aspect as this ensures that food is prepared in a space where there is no exposure to diseases that might affect the nutrient value of the food (Barrett, 2010; FANTA & FWP, 2007; WFP, 2009). A healthy physical environment includes clean water, proper sanitary facilities, food preparations and storage, and, in general, understanding adequate health care and nutrition data (Pangaribowo et al., 2013). A poor and low level of diet diversification can be associated with micronutrients deficiency (Bach & Aborisade, 2014; Pangaribowo et al., 2013)

2.4.4 Stability

According to Barrett and Lentz (2009), stability captures the vulnerability of people to food security due to interruptions in access, availability, or utilization. Here, the three pillars mentioned above of food security are influenced. Food security requires households to have access to nutritional, adequate food always. Inadequate access to food daily poses a risk on an

individual's nutritional status, affecting their socio-economic status, thereby categorizing a person as food insecure. According to Misselhorn & Hendriks (2017), being food insecure is both a cause and consequence of cycles of vulnerability, it is always a result of a resource shortage of one kind or another, which means there is no means for an individual or household to draw on to buffer a food security shock or stressor. Pangaribowo et al. (2013), outlined that extreme weather conditions, scarcity of energy, economic and social challenges, and unstable markets pose a significant risk to food stability.

2.5 Food insecurity

According to Barrett (2009), human population growth increased the pressure on the capacity of the earth to provide enough food, which led to food insecurity. Insufficient nutrient intake have cost people's lives (Barrett & Lentz, 2009). When limited access to sufficient nutritious and safe food that meets your physical and economic needs of everyday living is not met, food insecurity emerges. Gundersen and Ziliak (2015) describe food insecurity as a condition in which households have insufficient access to adequate food due to a lack of money or other resources. The term food insecurity is dated; however, its original meaning was not centred on adequate access to food but instead was used to describe the instability of national or regional food supplies over time (Barrett & Lentz, 2009; Habicht et al., 2004). In several cases, a commonly used term was hunger, which had limited conceptualization in terms of meaning as it only focused on the feeling of weakness from not eating (Broca, 2002). Barrett and Lentz (2009) argued that words like hunger, undernutrition, and malnutrition are distinctively used interchangeably and synonymously with food insecurity. They refer to hunger as physical discomfort caused by lack of food, while undernutrition relates to nutritional status, and malnutrition to undernutrition (Barrett & Lentz, 2009).

Considering the limitation the term brought, a broader concept had to be introduced, which took into consideration the four dimensions of food security (availability, access, utilization, and stability) (Habicht et al., 2004). Amongst many definitions considered to define food insecurity,

a commonly used definition explains food insecurity as when access to or availability of safe, culturally appropriate, and nutritious foods is compromised or when these foods cannot be obtained via socially acceptable means (Ashby et al., 2016).

2.5.1 Dimensions of food insecurity

Food insecurity can be categorized into two dimensions, chronic and transitory. The two dimensions refer to the duration of food insecurity (Hart, 2010). Transitory food insecurity refers to sudden and temporary disruptions in the availability, access, and rarely utilizing adequate food (Barrett & Lentz, 2009). Transitory food insecurity is seasonal, and it may be predicted in cases where grain stocks run low before harvest and when there are hikes in food prices (Devereux, 2006). Households are always at risk of being unable to acquire adequate nutritious food to meet the needs of everyone, and the reoccurrence of transitory food insecurity can cause families to be more vulnerable to food insecurity (Parvatham, 2015). Transitory food insecurity may arise through smaller shocks such as loss of income and crop at household levels (Hart, 2010). On the other hand, chronic food insecurity refers to the long-term challenge of availability, access, and utilization of adequate food (Barrett & Lentz, 2009). This dimension is closely related to structural deficiencies in the local food system, economy, chronic poverty, lack of assets, and low incomes, which continually limit food availability and access over a prolonged period (Devereux, 2006).

Other temporal crucial aspects of food insecurity are seasonal and cyclical food insecurity. Seasonal food insecurity happens when there is a cyclical pattern of inadequate access to food; cyclical food insecurity is easily predicted as it generally follows a sequence of known events (USAID & Africare, 2003). Seasonality can be associated with transitory food insecurity as it is limited. There are linkages with chronic food insecurity as a household would trade with their assets to access food for survival in that season (Devereux, 2006). As much as chronic and transitory food insecurity focus on the duration, intensity or severity should not be overlooked.

2.5.2 Intensity or severity of food insecurity

Understanding the intensity of food insecurity is also important to correctly target the food insecure during any shock and respond immediately. According to Hart (2010), focusing on the intensity rather than duration informs us about the scale of the food gap. It may present the severity of the situation and predict the outcomes of any future shocks. As Devereux (2006) states, chronic and transitory are linked, and they imply different durations; it is important to measure the severity of food insecurity.

According to Dhur (2005), calorie intake can measure if a person is moderately or severely food insecure. Moderate food insecurity refers to food intake in insufficient quantities and poor quality, which puts one's health nutritional status at risk (Dhur, 2005). Accessing food in a way that decreases capital and leads to the depletion of assets or risk jeopardizing the health and human capital, in the long run, can also be associated with moderate food insecurity (Dhur, 2005). Severe food insecurity focuses on food intake in insufficient quantities and quality to maintain proper health and nutrition; further, accessing food in a way that depletes productive assets and leads to destitution, or is socially unacceptable, or puts health at immediate risk (Dhur, 2005).

2.6 Food insecurity in South Africa

Food insecurity in South Africa has always remained a challenge, and this is caused by many factors, with unemployment being the most common factor. South Africa is ranked amongst the countries with the highest rate of income inequality globally and has extremely high levels of absolute poverty (Altman et al., 2009). However, on a national level, South Africa is considered food secure. It has more than 30 000 commercial farmers, 200 000 smallholder farmers, and about two million subsistence farmers responsible for ensuring food is available (Ngumbela et al., 2020). Since the post-apartheid era, food security has been considered a

national priority and has received significant policy attention and several interventions from the government, NGOs, civil society groups, and the public sector (Hendriks & Olivier, 2015; Hendriks, 2013). Battersby (2011) outlined that the problem of food insecurity was taken into serious consideration as it was part of the Millennium Development Goals (MDG's), and the African National Congress (ANC) identified it as a critical focus area in the 2009 General Election Manifesto.

Considering the 'right to food' by the South African constitution, South Africa has made some efforts to mitigate the problem of food insecurity since the beginning of the post-apartheid era. However, these efforts are hindered because individual and household access to food is influenced by many factors and is a dynamic process. There have been arguments that, despite the country's food security status, many households are still food insecure (Omotayo et al., 2019). The availability of food in the country does not determine access; thus, Altman and colleagues highlighted that to understand the distributional and accessibility issues, there needs to be an investigation of how food is distributed and accessed (Altman et al., 2009). Manyamba et al. (2012) argued that the fact that South Africa is considered a food-secure country means that food insecurity in the country is not due to a shortage of food but structural poverty, unemployment, and inequality

Although there has not been a standardized measure of food insecurity in South Africa that have been used across all studies, researchers in the country have employed some methodologies to try and measure the problem of food insecurity within the country. The most common measures used by the African Food Security Urban Network were the Household Food Insecurity Access Scale (HFIAS), Afrobarometer's Lived Poverty Index (LPI), and the FANTA's Household Dietary Diversity Scale (HDDS) (Misselhorn & Hendriks, 2017; Rudolph et al., 2012). Using some of the scales mentioned above, the African Food Security Urban Network surveyed three major South African cities (Cape Town, Pietermaritzburg, and Johannesburg). They found that in households, income and the ability to purchase food was

related to levels of food security, with several households relying on social grants (child support, disability, and pension), wage work, and casual work (Battersby, 2011; Crush & Caesar, 2014; Rudolph et al., 2012). This is in line with Sen's work, to which he outlines the trade-based right, which refers to people's ability to sell or buy food (Sen, 1981, Sen, 1986). According to Sen's framework, financial access is one of the means by which households gain access to food (Sen, 1981).

The UMsunduzi City reported approximately 60% of the households as severely food insecure, and 27% were moderately food insecure (Crush & Caesar, 2014). A small proportion of 7% was reported to be food secure (Crush & Caesar, 2014). Further, 58 % of the household mentioned that they had sometimes/often eaten a limited variety of foods due to a lack of resources (Crush & Caesar, 2014). s and an even higher number of 64 % mentioned that household members were sometimes/often unable to eat the kinds of foods they preferred because of a lack of resources. 60 % had sometimes/often eaten foods that they did not want to because of a lack of resources to obtain preferred food (Crush & Caesar, 2014)

2.7 Vulnerability to food insecurity

Vulnerability is a progressive concept that assesses exposure to sensitivity to future shocks at household and community levels (WFP, 2009). It is determined by the ability to cope with exposure to several risks posed by shocks such as natural hazards (drought, floods, crop failure) or human-made hazards such as economic fluctuations and conflict (WFP, 2009). According to Ellis (2003), individuals, households, communities, and nations face numerous hazards from different sources.

Vulnerability can be categorized into two dimensions; external and internal vulnerability, which are helpful to understand what to focus on when investigating the causes and nature of vulnerability (Hart, 2010). External vulnerability is concerned with the ability of households to respond and cope with stressors and the actions required to overcome or reduce the adverse

effects of exposure to environmental, economic, political, and social change (Bohle, 2001). Biophysical and socio-economic factors are generators of external vulnerability but are not limited to other changes such as the economy, politics, and social changes (Drimie & Casale, 2009). As described by Drimie & Casale (2009), internal vulnerability focuses on the means for coping without damaging loss. Loss can be becoming or being physically weaker, economically impoverish, social dependent, humiliated or psychologically harmed (Chambers, 2006). This dimension centres on coping and action to overcome, or at least mitigate, the adverse effects of economic and ecological change (Bohle, 2001). Coping resources or assets underpin resilience and the capacity to manage crises and solve conflicts; these may be economic, socio-political, infrastructural, ecological, or personal assets (Drimie & Casale, 2009). The distinct concept of vulnerability is most often associated with poverty; primarily if poverty is understood as a multi-dimensional concept that includes dimensions of economic, human, political, socio-cultural, and protective capabilities and vulnerability is understood in terms of exposure, sensitivity, and resilience to stresses and shocks (Segnestam, 2004).

Løvendal and Knowles (2005) outline vulnerability to food insecurity as falling or staying below a pre-determined food security threshold. When availability, access, and utilization to safe, nutritious, and acceptable food is not met, vulnerability to food insecurity emerges (Løvendal & Knowles, 2005). The stability dimension of food security considers vulnerability if households or individuals cannot always access food that pose them at greater risk of falling below the vulnerability line of food insecurity (Babatunde et al., 2008). It is, however, important to note that a person can be vulnerable to hunger even if they are not hungry at a given point in time; the ability to secure resources during emergencies can reduce vulnerability (Broca, 2002). Resources could be calling relatives or friends when needed having a line of credit or possessing sufficient assets that can be sold in times of emergencies (Broca, 2002).

As mentioned in Chapter 1, this research study explores the vulnerability to food insecurity amongst students at the University of KwaZulu-Natal. The following section provides

literature overview of the studies across the world, including Africa and South Africa, which explored the problem of food insecurity amongst students in institutions of higher learning (i.e., colleges and universities).

2.8 Vulnerability to food insecurity amongst students

Globally, access to higher education by everyone despite their socio-economic status has increased (Roser & Ortiz-Ospina, 2016). In post-apartheid South Africa, there has been a dramatic increase of students from all socio-economic backgrounds accessing higher learning institutions to pursue their professional dreams. The government has gone to the extent of investing large sums of money to help needy students study further despite their socio-economic status (DHET, 2016). However, as time progresses and more students enrol, higher learning institutions continually face challenges associated with the increased costs caused by a growing demand, which increase tuition fees. Statistics from the Department of Higher Education and Training (DHET) in South Africa reported that the number of students who enrolled in public higher institutions increased by 82 901 between 2010-2016 (DHET, 2016). In 2016, female students' enrolment was higher than male, where 58.1% of students were women, and only 41.9% were men (DHET, 2016).

Further, the report indicates that 71.9% of students were Africans, 15.7 white, 6.3% were Coloured, and 5.2% Indian (DHET, 2016). Considering access to higher education is available to everyone, including those from poor backgrounds, it should be expected that food insecurity will increase at institutions of higher learning. Although food insecurity at higher education institutions is not a new concept, there have been several initiatives that attempt to address the problem of food insecurity among university students and call for the government to intervene in terms of increasing allowances from the funding they provide students (Van den Berg & Raubenheimer, 2015)

The South African Human Rights Commission posits that every right in the constitution is

equal, and all rights are dependent on each other (SAHRC, 2016). Section 29 (1) of the Constitution of the Republic of South Africa states that “Everyone has the right to (a) a basic education, including adult basic education; and (b) to further education, which the state, through reasonable measures, must make progressively available and accessible” (*Constitution of the Republic of South Africa*, 1996). Section 27(1) (b) states that “everyone has the right to have access to sufficient food and water.” Further 27(2), obligates that “the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights.” (*Constitution of the Republic of South Africa*, 1996). Insufficient access to nutritious food can challenge the ability of an individual to learn, therefore, compromising their right to learn (SAHRC, 2016). Taking this right into consideration, over the years, the South African government introduced a National School Nutrition Programme in public schools to try and alleviate the issue of hunger. The program has benefited more than 9 million schools (Department of Basic Education, 2019).

The problem of food insecurity has been overlooked and not much research has been done concerning the prevalence among the student population in higher learning institutions. Van den Berg and Raubenheimer (2015) argue that the reason food insecurity is neglected could be from the assumption that higher education is only accessed by those who can afford to access basic food needs, shelter, and clothing. Research revealed that food insecurity is becoming prevalent among higher education students (Bruening et al., 2017). Studies conducted in developed countries like the United States of America found that 50-67% of undergraduate students were reported to have low levels of food insecurity, ranging from being anxious about food sufficiency to reduced food intake (Broton & Goldrick-Rab, 2018). A multi-institution study that investigated the issue of food insecurity across 8 campuses in the United States found that students at the University of Tennessee were more food insecure (25.0%) compared to students at West Virginia University (7.1%) (El Zein et al., 2019). Research conducted at the University of Hawai'i at Manoa revealed that only 21% of students were reported to be food

insecure, while 24% were at risk of food insecurity (Pia Chaparro et al., 2009). The study found that students living in on- campus and off-campus student residences with roommates were more likely to be food insecure than were students living with parents (Pia Chaparro et al., 2009). Another study done at Deakin University reported that 30% of the students were severely food insecure, and 60 % were not living with their families (Micevski et al., 2014).

A study conducted in California found that multi-ethnic students had the highest food insecurity rate compared to Black students, while Asian and White students had the lowest rates (Wood & Iii, 2018). The racial exploration of food insecurity was done based on the assumption that the problem might be heightened at community colleges where many students are from low-income backgrounds and are students of colour (Wood & Iii, 2018). Furthermore, the authors reported that food-insecure students reported having lower confidence in their academic abilities, perceptions of the usefulness of college, and being genuinely interested in learning (Wood & Iii, 2018). Another study conducted in California reported that of the 8705 college students, 40% reported experiencing food insecurity; those reported to be food secure had a cumulative A average compared to students experiencing food insecurity (Martinez et al., 2018). Students who were food insecure were reported to have significantly higher proportions of poor mental health indicators than food-secure students (Martinez et al., 2018). Studies conducted both in South Africa have found an associated between food insecurity and poor academic performance (El Zein et al., 2019; Rudolph et al., 2018; Weaver et al., 2020)

There is limited research on food insecurity among the student population in South Africa. Studies conducted over the years confirm that the issue of food insecurity is not only prevalent across colleges and universities in other countries but is also an issue in the South African university institutions (Munro et al., 2013; Van den Berg & Raubenheimer, 2015, Wagner et al., 2021). Research conducted between 2007 and 2010 at the UKZN reported that students receiving financial aid from the government (NSFAS) were significantly more vulnerable to food insecurity when compared to students on non-financial aid forms of funding (Munro et al.,

2013). Furthermore, A study conducted at the UKZN that aimed at exploring the relationship between food security and academic performance of students receiving financial aid reported that more than half (51.3%) of the sample of students in the study were moderately food insecure. About 12.5% were food insecure (Kassier & Veldman, 2013). The authors reported that almost two-thirds of the population reported being very hungry towards the end of the semester (Kassier & Veldman, 2013). Another study conducted at the University of Free State reported that food insecurity was prevalent in the institution (Van den Berg & Raubenheimer, 2015).

Furthermore, the UKZN study also reported that students experiencing food insecurity receive government financial aid (Munro et al., 2013). As DHET in South Africa emphasises access to university by diverse pupils of different socio-economic backgrounds, there is a high likelihood that food insecurity may impact the higher education students (DHET, 2016; Munro et al., 2013). Another study conducted at UKZN in 2015 reported 53.1% of the students experienced some level of vulnerability to food insecurity, where 44% experienced moderate levels of exposure; 9.2% were highly vulnerable (Sabi et al., 2020). A recent study conducted in a large South African University in 2019 found that 73% of students were found to be food insecure (Wagner et al., 2021)

The two recent studies conducted at the UKZN revealed that the problem of food insecurity does exist within the institution, which could be evidence that it also exists in other institutions of higher learning. The limitation of the two studies mentioned above is that the results could not be generalized to the larger population of the UKZN, as both studies sampled only students from the Pietermaritzburg campus. There is a need to explore the issue on other campuses, which this study anticipates achieving.

Integral to Sen's approach, the problem of food insecurity is seen as a supply issue and a lack

of successful demand among the disadvantaged. A variety of socioeconomic factors determines access to food. Household income and economic assets, costs, demographic factors (number, gender, and age structure of household), and socio-cultural factors such as health and sanitation, education level, cultural norms, and food consumption patterns are all factors on the demand side of the food insecurity equation (Krishnaraj, 2005). The approach considers three of the highlighted fundamental pillars of food security: availability, access, and affordability (Krishnaraj, 2005).

When considering food security among students at tertiary institutions, it is essential to note the negative effects these concerns may have on other complementary matters such as education and health. A student who is food insecure can experience health problems and underperform academically. Students play a critical role in society as they are the future of the country's economy, and the well-being of their families depend on them. It is within this scope to learn more about food insecurity at the University of KwaZulu-Natal. This information could help prepare programs to help students with food insecurity problems.

2.9 Conclusion

This chapter focused on the concept of food insecurity. The historical background of food insecurity from the global to the local level was highlighted. The chapter highlighted the pillars of food security and presented that food availability and accessibility are determined by several long-term and short-term factors. The chapter presented some literature on the issue of food insecurity in the South African context. It highlighted that although South Africa is seen as food secure on a national level, access to food is still a challenge to several households within the country.

Further, the chapter explored some literature around the issue of food insecurity amongst higher educational institutions (colleges, universities, etc.) and outlined factors contributing to food insecurity in these higher learning institutions and its impact on students. It further shared some

of the considerations that have been implemented to address the issue of food insecurity. Chapter 3 details the methodology employed by this study and its design.

Chapter 3 Methodology

3.1 Introduction

Chapter 3 describes all the methodological procedures followed when conducting the current study. Firstly, it revisits the study objectives and the research questions as presented in Chapter 1. Secondly, it presents the study's research design, sampling, and data collection methods and briefly describe the data collection tool used in this research study. Thirdly, the chapter also explains the ethical procedures followed when conducting the research and the data analysis process. Fourthly, it discusses how validity and reliability were ensured during the research process.

The focus of this study was to explore the problem of food insecurity among students at the UKZN. The current study sought to provide an updated measure of the vulnerability to food insecurity among students at the UKZN. It also explored the reasons that UKZN students attribute to their food insecurity. The study also investigated possible strategies that UKZN could implement to respond to food insecurity among its students.

3.2 Study objectives and research questions

3.2.1 The objectives of this study were:

- a. To provide a current indicator of vulnerability to food insecurity among students at all the UKZN campuses.
- b. To explore the reasons that contribute to UKZN students' food insecurity.
- c. To identify students' suggestions regarding what UKZN could do to respond to food insecurity among its students.

3.2.2 The research questions for the study were:

1. How vulnerable are UKZN students to food insecurity?
 - a. Are UKZN students more likely to be hungry at the end of a semester (near exams) than at the beginning of a semester?
 - b. Is there a difference in vulnerability to food insecurity between students on different UKZN campuses?
 - c. Are UKZN students on financial aid more vulnerable to food insecurity than students on other forms of funding?
 - d. Is there a relationship between where a student resides during the semester and their vulnerability to food insecurity?
2. What are the reasons UKZN students identify as contributing to their food insecurity?
3. What suggestions do UKZN students have for the way in which the institution could respond to the incidence of food insecurity among its students?

3.3 Research Design

The study employed a non-experimental survey research design which generated quantitative data. Quantitative research, as described by Creswell and Creswell (2018), is an approach involving testing objective theories through exploring relationships within variables. It employs experiments and surveys using pre-determined instruments that yield statistical data collection (Creswell & Creswell, 2018).

3.4 Study setting and population.

The study was conducted across all five UKZN campuses located in the two cities of Pietermaritzburg and Durban. The university welcomes a diverse body of students from

different social, socio-economic, and political contexts across the country and beyond. In 2017 UKZN had a population of 49 096 students which has gradually been increasing over the years (University of KwaZulu-Natal Annual Report, 2019)

3.5 Sampling

Because the proposal for the study was developed in 2017, the study's sample size was estimated based on the approximately 49 096 students (i.e., population) registered at UKZN in 2017 (University of KwaZulu-Natal Annual Report, 2017). A sample of approximately 1% of the population was anticipated to be sufficient and practical for the study. Moreover, based on the UKZN 2015 Annual Report and information obtained from UKZN's Institutional Intelligence, the following proportion of students were intended to be surveyed:

Funding proportions:

- 13% students on financial aid (NSFAS)
- 21% students on bursaries
- 13% students on scholarships
- 53% self-funded or funded by parents/family

Gender:

- 58% female
- 42% male

Race

- 71% Black African
- 2% Coloured
- 22% Indian
- 4% White

- 1% Other

Campus

- 12% Edgewood
- 33% Howard College
- 5% Medical School
- 22% Pietermaritzburg
- 28% Westville

College

- 41% Humanities
- 21% Agriculture, Engineering, and Sciences
- 14% Health Sciences
- 24% Law and Management Studies

Residence

- 25% UKZN residences (university owned and university leased)
- 75% off-campus accommodation

Unfortunately, the intended sample was not realised, and the actual sample characteristics are identified below in Table 3.1.

Table 3.1: *Sample demographics characteristics*

| Characteristic | Category | N (%) |
|--------------------------|-----------------------------------|--------------|
| Gender | Male | 144 (32.9) |
| | Female | 292 (66.7) |
| Nationality | South African | 414 (94.5) |
| | Refugee | 3 (0.7) |
| Race | Indian | 37 (8.4) |
| | Black African | 373 (85.2) |
| | Coloured | 17 (3.9) |
| Campus | PMB | 150 (34.2) |
| | Howard College | 103 (23.5) |
| | Edgewood | 56 (12.8) |
| | Westville | 78 (17.8) |
| Residence | Family/Relative | 91 (20.8) |
| | UKZN residence | 255 (58.2) |
| | Privately leased student' commune | 68 (15.5) |
| | Squatting | 5 (1.1) |
| Source of funding | Financial aid | 199 (45.4) |
| | Self-funded | 44 (10.0) |
| | Bursary | 36 (8.4) |
| | Scholarship | 31 (7.1) |
| | Bank loan | 13 (3.0) |
| | Other | 5(1.1) |

Note. $N = 438$

While planning for the study, a probability sampling method such as simple random sampling was practically impossible. According to Adams, Khan, Raeside, and White (2007), a specified population selection is made in simple random sampling. Each unit is selected with known and non-zero probability, which means every unit in the population has an equal chance of being selected (Adams, Khan, Raeside & White, 2007). Although it was technically possible to obtain a complete population list (i.e., a list of all registered UKZN students) and generate a

random sample from this list, two reasons made this practically improbable to implement. Firstly, it was likely that the institution would not grant permission to access and use this list for simple random sampling purposes. UKZN must protect and keep confidential the constituents' personal information (e.g., contact numbers) and not permit researchers to contact students directly using the student email account system (Protection of Personal Information Act, 2013). Secondly, even if contactable, it was unlikely that all randomly selected students would agree to participate in the study. The study will only be left with a non-representative sample of volunteers from the random sample.

Therefore, a non-probability quota and convenience sampling method was used in this study. A similar non-probability (but non-quota-oriented) sampling strategy was used in a previous study of food insecurity at UKZN (Munro et al., 2013). Still, this study only sampled students from the UKZN Pietermaritzburg campus. The current study attempted to overcome this limitation by including other campuses in the sample (i.e., Westville, Howard College, Edgewood, and Nelson Mandela School of Medicine campuses). The objective of quota sampling “is to obtain representatives of the various elements of a population, usually in the relative proportions in which they occur in the population” (Robson, 2011, p. 274).

The Munro et al. (2013) study sampled to maximize exposure to the food insecurity questionnaire for students across a range of residential, socio-economic, and faculty arrangements; this study used quota sampling to target proportional numbers of individuals representing elements of interest of the population. Those elements (as established from the Munro et al., [2013] study) were the type of funding (e.g., financial aid, bursary, scholarship, or self-funded), race, gender, residence type, and campus). This study used convenience sampling. Etikan (2016) defines convenience sampling as a non-random sampling method where potential participants of the target population must meet specific criteria (such as easy

accessibility, geographical area, availability at a time, and willingness to participate) to be included in the study.

3.6 Data Collection Procedure

The study aimed to recruit study participants across all five UKZN campuses, employing a questionnaire method of data collection (see Appendix 2). That collection took place between March and August 2018. Questionnaires were either completed manually or online, depending on the convenience of the participants. The researcher visited each of the five campuses during data collection and spent approximately two hours personally inviting students to participate in the study. Participants were recruited at common areas on the various campuses (e.g., open gathering spaces, coffee shops, foyers, student union buildings). The researcher carried hard copies of the research information sheet, consent forms, and the questionnaire to interested participants. The data collection process took place before the COVID-19 pandemic when face-to-face interactions were still possible when collecting data.

For students who showed an interest in participating, the researcher explained the study's procedure and provided them with the study information sheet and informed consent to sign. The approached participants were then invited to complete a hard copy of the questionnaire, which took no longer than 10 minutes. After completing the questionnaire, the participants then placed the completed questionnaire in a sealed box. Alternatively, students who did not have the time to complete the hard copy of the questionnaire immediately were given a copy of the information sheet that contained a URL/link to an electronic copy of the questionnaire. The students were then asked to complete the electronic version of the questionnaire in their own time. The UKZN online notification system was also used to invite potential participants to complete an online questionnaire version. Gatekeepers permission to place the questionnaire online was granted and the questionnaire was loaded on Google forms and duly saved in a password-protected Google drive. Only the researcher and supervisor had access to it.

Since the data collection process took place shortly after the 2018 academic program began, first-year students were technically not eligible to participate in the study. They had not experienced some aspects of the conditions asked about in the questionnaire (i.e., the experience of food insecurity during examinations). The data collection took place from March 2018 to May 2018. Of 438 participants who consented to participate in the study, 53 completed the online questionnaire, and 385 completed the manual version.

3.7 Data Collection Instrument: The University Student Food Insecurity Questionnaire (USFIQ)

The University Student Food Insecurity Questionnaire (USFIQ) was administered to the willing participants. The USFIQ was developed, tested, and administered by the researchers who initially researched food insecurity at UKZN, and the questionnaire was based on the Household Food Insecurity Access Scale (HFIAS) (Munro et al., 2013). This study used the same questionnaire. In collaboration with the primary researcher from the first study (and supervisor), some questions were edited for grammatical accuracy. The questionnaire consists of questions exploring anxiety or uncertainty about food supply, insufficient food quality, insufficient food intake, and physical consequences of not having reliable access to food (Munro et al., 2013). The questionnaire begins by asking biographical questions about race, gender, and academic enrolment and ends by asking participants their perceptions of how vulnerability to food insecurity may be addressed in the institution.

The questionnaire consists of 53 questions required to be completed by the participants in different responses formats. Embedded within the 53 questions is a 13-item scale measuring vulnerability to food insecurity. The questions included in the 13-item scale were encompassed in the questionnaire (see Table 3.2).

Table 3.2: *Scale items embedded in the University Students Food Insecurity Questionnaire (USFIQ)*

Scale items embedded in the University Students Food Insecurity Questionnaire

1. How often do you eat a smaller meal than you felt you needed because there was not enough food
2. How often do you eat fewer meals in a day because there is not enough food?
3. How often do you eat cheaper foods or eat the same foods for several days in a row because there is not enough money for food?
4. How often do you have no food at all because there is not enough money to get more?
5. How often do you struggle to concentrate in class and/or while you are studying because you are hungry?
6. How often do you feel weak (tired) because you are hungry?
7. How often does hunger negatively affect your moods?
8. How often do you miss lectures/tutorials because you are hungry?
9. Do you feel that your health suffers because you don't get enough food or because you don't eat good enough food?
10. How often do you worry where your next meal will come from?
11. How often do you go for 24hrs without eating because you did not have enough money for food?
12. How often do you go hungry at the beginning of the semester?
13. How often do you go hungry at the end of the semester or during examinations?

From: Munro et al. (2013)

Items were formatted on a 5-point Likert scale with options beginning from 'never' to 'almost always'. A factor analysis was employed to verify if the food insecurity items were unidimensional and test for the scale's reliability (specifically Cronbach's alpha) (Munro et al., 2013). It should be noted that a scale score provided when completing the questionnaire meant

the students had encountered the situation either never, seldom, sometimes, often, or almost always (see Table 3.3).

Table 3.3 *Scale scores and experiences of food insecurity description*

| Scale score | Experience of food insecurity |
|-------------|-------------------------------|
| 0 | Never |
| 1 | Seldom |
| 2 | Sometimes |
| 3 | Often |
| 4 | Almost always |

3.8 Statistical analysis

The data attained was managed and analysed using SPSS (Statistical Packages for Social Sciences) Version 27. In the first part of the data analysis, descriptive statistics were used to explore the sample's characteristics. In addition, descriptive analyses were used to satisfy the second and third study objectives, which were to:

- Explore the reasons that contribute to UKZN students' food insecurity and
- Explore students' suggestions for how UKZN could respond to food insecurity amongst students.

Furthermore, descriptive statistics were used to estimate the prevalence of food insecurity in the sample and explore the strategies used by students to access food. Larson (2006) explains descriptive statistics as a method that presents the basic features; descriptive statistics summarise the sample and the measure in tables or graphs.

According to Larson (2006), inferential statistics make inferences about the populations from which the sample data is drawn. In the second part of the data analysis, inferential statistics were used to respond to the first research objective (i.e., to provide a current indicator of

vulnerability to food insecurity among students at UKZN) and the corresponding first research question. The first research question included four sub-questions, which were.

- a. Are UKZN students more likely to be hungry at the end of a semester (near exams) than at the beginning of a semester?
- b. Is there a difference in vulnerability to food insecurity between students on different UKZN campuses?
- c. Are UKZN students on financial aid more vulnerable to food insecurity than students on other forms of funding?
- d. Is there a relationship between where a student resides during the semester and their vulnerability to food insecurity?

The following null and alternative hypotheses were developed for the first sub-question:

Null Hypotheses (H_0): There is no difference in students' hunger levels at the end of a semester (near exams) and the beginning of a semester.

Alternative Hypothesis (H_A): There is a difference in students' hunger levels at the end of a semester (near exams) and the beginning of a semester.

To test this hypothesis, a paired-samples t-test was used to compare the mean difference in reported hunger levels at the beginning and end of the semester.

The following null and alternative hypotheses were developed for the second sub-question:

Null Hypotheses (H_0): There is no difference in vulnerability to food insecurity between students on different UKZN campuses.

Alternative Hypothesis (H_A): There is a difference in vulnerability to food insecurity between students on different UKZN campuses.

To test this hypothesis, a one-way between-subjects Analysis of Variance (ANOVA) was performed to compare food insecurity levels across different campuses at UKZN.

The following null and alternative hypotheses were developed for the third sub-question

Null Hypothesis (H_0): There is no difference in students' vulnerability to food insecurity at UKZN between students on NSFAS and those not on NSFAS

Alternative Hypothesis (H_A): There is a difference in students' vulnerability to food insecurity at UKZN between students on NSFAS and those not on NSFAS

To test this hypothesis, an independent sample t-test was used to compare vulnerability to food insecurity between students receiving NSFAS and those not receiving NSFAS.

The following null and alternative hypotheses were developed for the fourth sub-question

Null Hypotheses (H_0): There is no relationship in vulnerability to food insecurity and where students reside during the semester

Alternative Hypothesis (H_A): There is a relationship in vulnerability to food insecurity and where students reside during the semester.

To test this hypothesis, an ANOVA test was used to explore the relationship between students' residence during the semester and vulnerability to food insecurity.

An overall level of vulnerability to food insecurity was generated using the scale embedded within the USFIQ. Table 3.4 provides a summary of the tests performed in response to the research questions:

Table 3.4: *Summary of the tests performed in response to the research questions.*

| Research Question | Test |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| 1. How vulnerable are UKZN students to food insecurity? | Descriptive (13 items scale average) |
| 2. Are UKZN students more likely to be vulnerable to food insecurity at the end of a semester (near exams) than at the beginning of a semester? | Paired-Samples T-test |
| 3. Is there a difference in vulnerability to food insecurity between students on different UKZN campuses? | ANOVA |
| 4. Are UKZN students on financial aid more vulnerable to food insecurity than students on other forms of funding? | Independent samples test |
| 5. Is there a relationship between where a student resides during the semester and their vulnerability to food insecurity? | ANOVA |
| 6. What are the reasons UKZN students identify as contributing to their food insecurity? | Proportions |
| 7. What suggestions do UKZN students have for the way in which UKZN could respond to the incidence of food insecurity among its students? | Proportions |

3.9 Ethical Considerations

Before applying for and being granted ethical clearance (see Appendix 3) to conduct this study, several ethical considerations were considered to ensure that participants participate without being harmed and that anonymity is certain.

3.9.1 Permission to conduct the study

Before the data collection process commenced, the Humanities and Social Science Research Ethics Committee granted ethics approval for this research study (Protocol Reference Number HSS/0854017M) (see Appendix 3). Gatekeeper's permission was also obtained from the

UKZN Registrar, which allowed the researcher to approach students personally and invite them to participate in the study (see Appendix 4). After being informed of the purpose and scope of the study, all participants signed an informed consent document to ensure that participation was voluntary, and that confidentiality and privacy were maintained. Individual data could not be linked to individual participants since all the identifying information was not included in the questionnaire.

3.9.2 Informed consent

All potential participants were provided with an information sheet explaining the nature and the scope of the study before completing the questionnaire. The informed consent declaration document (see Appendix 5) was attached to the information sheet. The researcher clearly explained what the study was about and informed the participants that the study was voluntary and that confidentiality and anonymity in reporting the findings would be ensured. For the participants who completed the questionnaire online, a consent form with all the study procedures was presented to them before completing the questionnaire. Continuing with completing the questionnaire meant that participants consent to participate in the projects. After completing the questionnaire, the researcher clearly outlined that the participants' responses would not be linked to them.

3.9.3 Favourable risk-benefit ratio

There was little or no risk of harm for participating in this study. However, referrals to relevant student support departments were clearly stated in the information sheet should the participants feel they needed assistance with accessing support for food insecurity (see Appendix 5). The researcher advised potential participants that their completion or non-completion of the questionnaire had no bearing on allocating food parcels/vouchers or money to participants in cases where the participant self-reports any vulnerability to food insecurity.

3.9.4 Confidentiality

Participants' personal information was not included in the consent form; only signatures and dates were required. The questionnaire did not ask for disclosure of any personal information other than the participant's gender, race, and academic enrolment. Data obtained from participants was safely stored in a secured computer folder.

3.9.5 Compensation

There were no incentives for participating in the study; however, a R300 Spur voucher raffle draw was offered at the end of the study. To ensure confidentiality, the contact information of email addresses for the participants who wanted to enter the voucher giveaway was recorded separately from the relevant participant's questionnaire. An email was sent to the appropriate individual to announce the winner, stating that they had won the voucher and should confirm their details. Following the confirmation, an e-voucher was forwarded to the winner via email.

3.10 Validity and Reliability

3.10.1 Validity

In research, the instrument's quality and the research in its entirety are measured through validity, reliability, and rigor. Validity is a crucial key to effective research (Cohen, Manion, & Morrison, 2009), and research must ensure that it measures what it ought to measure as grounded in the research methodology. Looking at the issue of food insecurity among students at universities, the researcher attempted to draw the sample from the population of the students within the university institution.

Regarding the research instrument (i.e., the USFIQ), it should be noted that the instrument used in research had to measure what it aspires to measure and thus looked through the concepts of content, construct, and criterion validity. Content validity looks at the extent to which a research

instrument accurately measures all aspects of a construct (Heale & Twycross, 2015). Construct validity looks at the extent to which a research instrument used, or tool measures the intended construct, and lastly, criterion validity explores the extent to which a research instrument is related to other instruments that measure the same variables (Heale & Twycross, 2015)

In this research, content validity was ensured using a questionnaire used before and validated in previous studies (Munro et al., 2013). The instrument's content validity was established in the previous study through a panel of experts (i.e., dietitians, food security experts, lecturers, students, and student support professionals). Van der Riet and Durrheim (2006) outlined that researchers use previously tested measures to ensure an accurate conclusion can be drawn from the results. In the previous research, construct validity was established through the USFIQ over three years (i.e., 2007, 2008, and 2009. Administration with different groups of students across the three years (e.g., mainstream and access program students; students in residences and students residing in off-campus residence; and students on financial aid and students not receiving financial aid (Munro et al., 2013). Unfortunately, criterion validity for the USFIQ has not yet been statistically established; however, its development and questions were theoretically aligned with the Household Food Insecurity Access Scale (HFIAS).

3.10.2 Reliability

“Reliability is the degree to which the results are repeatable” (Van der Riet & Durrheim, 2006, p. 92). Therefore, reliability relates to the consistency of a measure and considers the degree to which the instrument repeatedly measures what it attributes to measure. (Heale & Twycross, 2015). Cronbach’s alpha was computed on each set of items in the USFIQ. High Cronbach’s alpha values suggest that all items are highly correlated, suggesting that they measure the same construct, therefore providing evidence for internal consistency reliability of a scale. A reliability analysis using Cronbach’s alpha (.917) was run for the study in this dissertation, the results from which affirmed the instrument’s internal consistency. A reliability analysis using

Cronbach's alpha was also conducted in the previous study (Munro et al., 2013), and the results from this analysis (i.e., .916) also suggested a high degree of scale reliability.

3.11 Conclusion

Chapter 3 provides other researchers interested in exploring the topic at hand on the processes that were undertaken by the researcher while conducting this research. This chapter outlined the step-by-step procedures carried out in this research study. The measuring tools used to obtain the data related to each study were also discussed. The chapter discussed how sample selection, data collection, analysis, and reporting of the data for each study objective were conducted. The results of the data analysis are reported in the next chapter.

Chapter 4 Results

4.1 Introduction

Chapter 3 discussed the methodology and the analysis processes used in this study. This study aimed to explore the problem of food insecurity among students at the University of KwaZulu-Natal, and the study used a non-experimental survey research design that generated quantitative data. SPSS version 27, a statistical software that offers statistical analysis for research data, managed and analysed the data. The measurement tool used for this study was the USFIQ which was developed and tested at UKZN (see Chapter 3).

Chapter 4 presents the descriptive and inferential statistics generated during the analysis process. The study included 438 students from UKZN who completed the USFIQ between March and August 2018. The results are presented according to the research questions. Firstly, descriptive statistics are used to describe the prevalence of food insecurity among university students. Further, the results regarding the strategies used by students to access food, factors contributing to students' vulnerability to food insecurity and the reasons that contribute to UKZN students' food insecurity, and suggestions for how UKZN could respond to food insecurity amongst students will be presented.

Inferential statistics to compare different groups of students within the UKZN are further presented. The likelihood of hunger at the end of a semester (near exams) compared to the beginning of a semester is presented, including the results showing a difference in vulnerability in vulnerability to food insecurity between students on different UKZN campuses. Additionally, the relationship between students on financial aid and vulnerability to food insecurity (compared to students on other forms of funding) and the relationship between where a student resides during the semester and vulnerability to food insecurity are presented. A summation of the findings is provided at the end of the chapter.

4.2 Descriptive statistics

Descriptive statistics were used to describe the prevalence of food insecurity among university students to investigate the study objectives. In addition, strategies used by students to access food were explored. Factors contributing to students' vulnerability to food insecurity were further investigated, as are the reasons for UKZN students' food insecurity. Lastly, suggestions for how UKZN could respond to food insecurity amongst students are outlined in this section. The demographic background of the samples will also be presented.

4.2.1 Sample characteristics

The demographic variables in this section intend to provide an outline of the study sample's qualities, which may assess any influence they may have had on the results. The sample distribution was analysed across gender, race, nationality, campus, residence, and funding source. 438 participants completed the USFIQ across all five UKZN campuses, comprising only 1% of the university student community. 144 (32.9%) of the sample were males, and 292 (66.7%) were females. Two respondents (covering 0.5 % of the sample) identified themselves as neither male nor female. Amongst the 438 participants, 94.5% identified themselves as South African, 4.8% as international citizens, and 0.4% as refugees.

Regarding race, 85.2% of the respondents identified themselves as black African, 8.4 % as Indian, and 11% as white. Many respondents who completed the questionnaire were from the Pietermaritzburg campus (34.2%) and Howard College campus (23.5%), while 12.7% were registered at the Edgewood campus and 11.6% the Medical School Campus. More than half of the sample resided in UKZN leased residences (58.2%). About 20.8% of those who did not reside in UKZN residences or UKZN leased residences reported living with family or relatives. 15% of the study respondents claimed to reside in privately leased student' communes, while 1.1% of the participants reported squatting. The question about funding sources shows that 45.9% received NSFAS financial aid, with 25.1% of the sample being primarily funded through

parents or relatives. A very small number of respondents (3.0%) were funded through bank loans. A summary of the participant's demographics as described above is presented in Table 4.1.

Table 4.1: *Participants' demographics*

| Characteristic | Category | N (%) |
|--------------------------|-----------------------------------|--------------|
| Gender | Male | 144 (32.9) |
| | Female | 292 (66.7) |
| Nationality | South African | 414 (94.5) |
| | Refugee | 3 (0.7) |
| Race | Indian | 37 (8.4) |
| | Black African | 373 (85.2) |
| | Coloured | 17 (3.9) |
| Campus | PMB | 150 (34.2) |
| | Howard College | 103 (23.5) |
| | Edgewood | 56 (12.8) |
| | Westville | 78 (17.8) |
| Residence | Family/Relative | 91 (20.8) |
| | UKZN residence | 255 (58.2) |
| | Privately leased student' commune | 68 (15.5) |
| | Squatting | 5 (1.1) |
| Source of funding | Financial aid | 199 (45.4) |
| | Self-funded | 44 (10.0) |
| | Bursary | 36 (8.4) |
| | Scholarship | 31 (7.1) |
| | Bank loan | 13 (3.0) |
| | Other | 5(1.1) |

4.2.2 Vulnerability to food insecurity

Responses to the 13-item scale embedded in the USFIQ were averaged to calculate each participant's vulnerability to food insecurity score. The process included computing the average scores of the 13-item scale using the MEAN function on SPSS. The average scores were rounded to the whole number using the RND1 function to categorise the scores into their respective vulnerability category. Participants who responded to less than 80% of the questions under the 13-item scale were excluded from the data to deal with missing data. Students who completed the questionnaire were characterised as experiencing critical food insecurity (average score of 4), severe food insecurity (average score of 3), serious food insecurity (average score of 2), low food insecurity (average score of 1) and no food insecurity (average score of 0). For this sample, the overall vulnerability to food insecurity was low ($M=1.50$, $SD=0.8$), with 11% of the sample reporting no food insecurity and 40.5 % reporting low levels of food insecurity. A further 36.2% of the sample reported experiencing a serious food insecurity issue (i.e., average food insecurity score of 2), whilst 12.4% reported severe food insecurity levels (i.e., average food insecurity score of 3). No students reported critical levels of food insecurity (i.e., average food insecurity score of 4). Students classified as experiencing “serious” to “severe” levels of food insecurity (average scores between 2 and 3) would have mostly responded “sometimes” and “often” when responding to the 13 scale items embedded in the USFIQ. This excludes one participant who completed 9 out of 13 questions and was considered a variable with missing data. Table 4.2 displays the sample's average scaled scores and levels of vulnerability to food insecurity.

Table 4.2: *Average scaled scores and levels of vulnerability to food insecurity*

| Scaled Score | Average experience of FI across items | Level of Food Insecurity (FI) | % |
|--------------|---------------------------------------|-------------------------------|-------|
| 0 | Never | No FI | 11.0% |
| 1 | Seldom | Low FI | 40.5% |
| 2 | Sometimes | Serious FI | 36.2% |
| 3 | Often | Severe FI | 12.4% |
| 4 | Almost always | Critical FI | 0% |

Note: N=438

4.2.3 Strategies used by students to get food

This section presents the strategies reportedly used by students to get food. In Section 4 of the USFIQ, participants were asked to indicate how often they employed strategies to acquire food and navigate their food challenges. The results show that about 42.7% of students from the sample “often” or “almost always” asked their families for food/money, the most common food acquisition strategy used by students. Only 1.6 % of the students “often” or “almost always” made use of the university student support services, and 10% asked their friends for food “often” or “almost always.” In addition, 16% reported borrowing money from friends for food “often” or “almost always.” Significantly few students reported resorting to other ways of accessing food (such as soup kitchens, taking food from someone else without asking, doing something in exchange for food (i.e., favour), exchanging a sexual favour for food, or asking a lecturer for food). Table 4.3 presents the proportions of responses per response option.

Table 4.3: Strategies used by students to get food

| Statement | Never N (%) | Seldom N (%) | Sometimes N (%) | Often N (%) | Almost always N (%) |
|--------------------------------------------------|----------------|-----------------|--------------------|----------------|---------------------------|
| Ask your family for food/money | 66 (15.1%) | 76 (17.4%) | 109 (24.9%) | 87(19.9%) | 100 (22.8%) |
| Ask friends for food | 153 (34.9%) | 120 (27.4%) | 121 (27.6%) | 32 (7.3%) | 12 (2.7%) |
| Borrow extra money from friends | 145 (33.1%) | 115 (26.3%) | 108 (24.7%) | 55 (12.6%) | 15 (3.4%) |
| Ask Student Support Services for food | 399 (87.2%) | 14 (5.7%) | 18 (4.1%) | 5 (1.1%) | 2 (0.5%) |
| Go to a soup kitchen (e.g., Salvation Army) | 382 (87.2%) | 25 (5.7%) | 29 (6.6%) | 1 (0.2%) | 1 (0.2%) |
| Take food from someone else without asking | 383 (87.4%) | 34 (7.8%) | 18 (4.1%) | 2 (0.5%) | 1 (0.2%) |
| Do something in exchange for food (i.e., favour) | 347 (79.2%) | 50 (11.4%) | 27 (6.2%) | 11 (2.5%) | 3 (0.7%) |
| Exchange a sexual favour for food | 411 (93.8%) | 11 (2.5%) | 9 (2.1%) | 4(0.2%) | 2 (0.5%) |
| Ask a lecturer for food | 421 (96.1%) | 13 (3.0%) | 2 (0.5%) | 2 (0.5%) | 0 (0%) |
| *Other, please specify: | 394 (90.0%) | 14 (3.2%) | 92 (3.7%) | 37 (2.1%) | 17 (1.1%) |

Missing System: 1 (0.2%)- Exchange sexual favor for food

*Other: Included running a small business, family cooking food for a student, attending social events, do part-time work outside learning hours i.e. weekends, grow own garden, visit nearby relatives,

4.2.4 Factors contributing to students' vulnerability to food insecurity

This section of the findings reports on the participants' responses regarding the major factors that contributed to them experiencing vulnerability to food insecurity during a semester (see Section 4 of the USFIQ in Appendix 2). In Section 4 of the USFIQ, participants responded to possible reasons on a 5-point scale which could account for why a university student might experience vulnerability to food insecurity in a semester.

According to the results, several factors reportedly contributed to students' vulnerability to food insecurity. The data reveals that 43% of respondents reported "often" or "almost always" going hungry in a semester because they had spent their money on stationery, books, and photocopying. The data also reveals that 42.2% of respondents reported "often" or "almost always" going hungry in a semester because they finished their food allowance before the next one was put into their account. The third highest factor students endorsed contributing to their vulnerability to food insecurity during a semester was that their family could not afford enough money to offer the student to buy food. This response was endorsed "often" or "almost always" by 39.7% of respondents. Table 4.4 presents the proportions of responses per response option.

Table 4.4: *Factors contributing to students' food insecurity.*

| Statement | Never N (%) | Seldom N (%) | Sometimes N (%) | Often N (%) | Almost always N (%) |
|----------------------------------------------------------------------------------------|------------------------|-------------------------|----------------------------|------------------------|------------------------------------|
| I was trying to eat less so that I could lose weight | 257 (58.7%) | 44 9 (10.0%) | 81(18.5%) | 38(8.7%) | 18(4.1%) |
| My food allowance or money was not enough | 66 (15.1%) | 76 (17.4%) | 91 (20.8%) | 91 (20.8%) | 4 (0.9%) |
| My family could not provide enough money for me to buy food | 108 (24.7%) | 68 (15.5%) | 88 (20.1%) | 75 (17.1%) | 99 (22.6%) |
| I did not receive money I expected from my family | 118 (26.9%) | 73 (16.7%) | 77 (17.6%) | 92 (21.0%) | 76 (17.4%) |
| I did not receive a financial aid meal allowance | 213 (48.6%) | 64 (14.6%) | 61 (13.9%) | 35 (8.0%) | 60 (13.7%) |
| I finished my food allowance before the next one was put into my account | 124 (28.3%) | 51(11.6%) | 74 (16.9%) | 71 (16.2%) | 114 (26.0%) |
| I spent my food money on other priorities (e.g., clothes, airtime, entertainment etc.) | 161 (36.8%) | 101(23.1%) | 98 (22.4%) | 45 (10.3%) | 32 (7.3%) |
| I spent my food money on transport. | 215 (49.1%) | 76 (17.4%) | 92 (21.0%) | 37 (8.4%) | 17 (3.9%) |
| I spent my food money on stationery, books photocopying | 76 (17.4%) | 67 (15.3%) | 105 (24.0%) | 108 (24.7%) | 80 (18.3%) |

| | | | | | |
|-----------------------------------------------------------------|-------------|-------------|-------------|------------|------------|
| I sent some of my meal allowance home | 199 (45.4%) | 74 (16.9%) | 77 (17.6%) | 36 (8.2%) | 46 (10.5%) |
| I shared my food allowance with another student. | 189 (43.2%) | 111 (25.3%) | 95 (21.7%) | 28 (6.4%) | 11 (2.5%) |
| I had my food/money stolen | 289 (66.0%) | 72 (16.4%) | 60 (13.7%) | 13 (3.0%) | 2 (0.5%) |
| I paid off debt (e.g., outstanding fees) with my food allowance | 274 (62.6%) | 59 (13.5%) | 53 (12.1%) | 31 (7.1%) | 15 (3.4%) |
| I lent money to others | 197 (45.0%) | 108 (24.7%) | 106 (24.2%) | 22 (5.0%) | 3 (0.7%) |
| I spent my money too quickly | 142 (32.4%) | 111 (25.3%) | 104 (23.7%) | 49 (11.2%) | 31 (7.1%) |

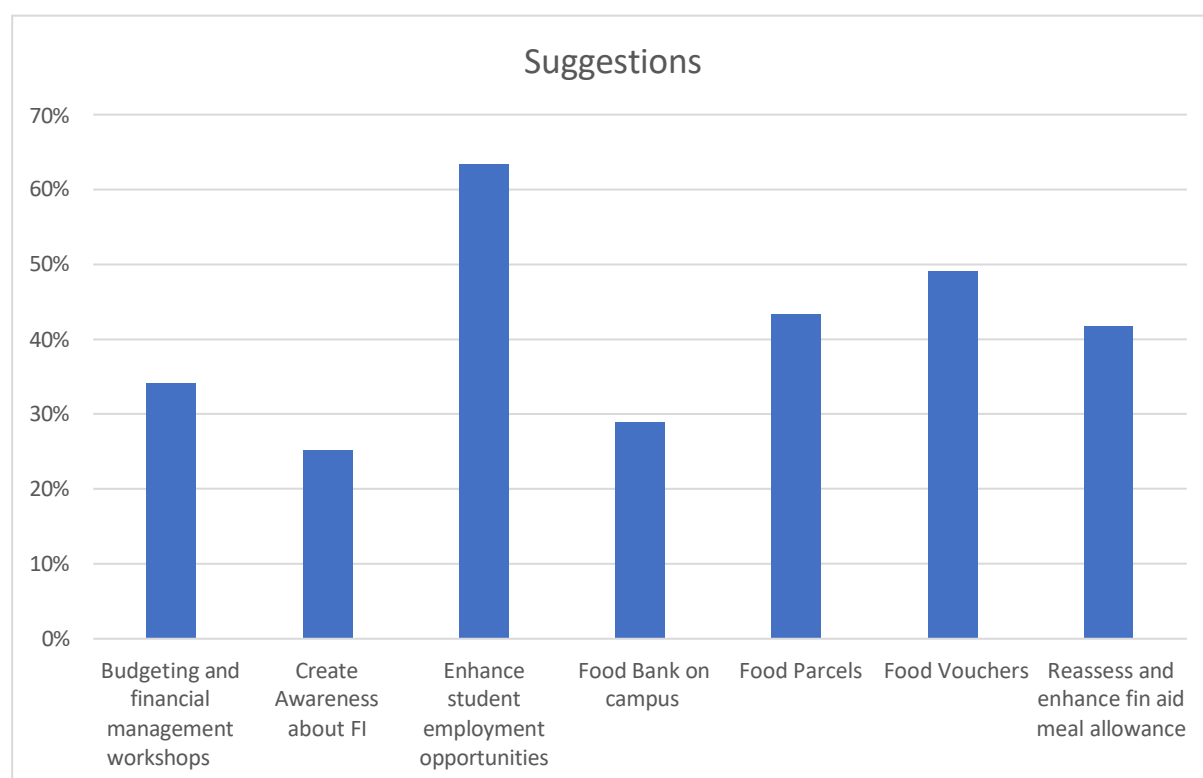
4.2.5 Students' suggestions on how UKZN could respond to the incidence of food insecurity among its students.

A list of possible suggestions for institutional management of food insecurity was included in the USFIQ. (Refer to section 5 of the USFIQ in Appendix 2). To calculate this, all responses were entered into Microsoft Excel for analysis. A count of responses per item was done using Microsoft Excel, and an average was calculated out of the total number of participants (438). The results show that 63% of the participants suggested that the university should enhance student employment opportunities at university, while 49% indicated the use of food vouchers, and 43% suggested food parcels. 42% of the sample indicated that the university enhances the financial aid meal allowance, and 29% thought food banks on campus could assist. Lastly, 42% of the sample suggested implementing budgeting and financial management workshops. Table 4.5 presents the statistics of suggestions provided by the students, while Figure 4.1 visually displays the proportions of students suggestions on a bar graph format.

Table 4.5: *Students' suggestions on how UKZN could respond to the incidence of food insecurity.*

| Suggestion | Responses | % |
|----------------------------------------------|------------------|----------|
| Food Vouchers | 214 | 49% |
| Enhance student employment opportunities | 276 | 63% |
| Create Awareness about FI | 110 | 25% |
| Food Parcels | 189 | 43% |
| Food Bank on campus | 126 | 29% |
| Reassess and enhance fin aid meal allowance | 182 | 42% |
| Budgeting and financial management workshops | 149 | 42% |

Figure 4.1: *Students' suggestions on how UKZN could respond to the incidence of food insecurity.*



4.3 Inferential Statistics

Inferential statistics were used to try and make predictions about the UKZN student population from the sample data collected. Although there were limitations with the sample of this study, it was nonetheless useful to try and make inferences about the UKZN student population through the sample data. Specifically, a paired-samples t-test was used to compare the mean hunger scores at the beginning and end of the semester. An independent sample t-test was used to compare vulnerability to food insecurity between students receiving NSFAS and those not receiving NSFAS. A one-way between-subjects ANOVA was performed to compare vulnerability to food insecurity levels across different campuses at UKZN based on the vulnerability score. Further, an ANOVA was used to explore the relationship between students' residence during the semester and hunger.

4.3.1 Hunger at the beginning and end of the semester

A paired-samples t-test was used to compare students' self-reported hunger levels at the end of a semester (near exams) and the beginning of a semester. There were no outliers in the data, as assessed by boxplots. The results from this test reveal no significant difference in mean reported hunger levels between the beginning of the semester ($M = 1.69$, $SD = 1.422$) and end of the semester (near exams) ($M = 1.69$, $SD = 1.296$); $t(435) = -.131$, $p > 0.896$. We, therefore, fail to reject the null hypothesis that there is a difference in students' hunger levels at the beginning of a semester and the end of the semester. Table 4.6 illustrates the statistical results from the paired-samples t-test.

Table 4.6: *Hunger at the beginning of the semester and the end of the semester*

| | Beginning of the semester | | End of the semester | | | 95% CI for mean Difference | | | | |
|---------|------------------------------|-----------|------------------------|-----------|----------|----------------------------------|------|----------|----------|-----------|
| Outcome | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>N</i> | | | <i>r</i> | <i>t</i> | <i>df</i> |
| | 1.69 | 1.422 | 1.69 | 1.296 | 436 | -.110 | .097 | .68 | -.131 | 435 |

* $p > .05$

4.3.2 The difference in vulnerability to food insecurity between students on different UKZN campuses.

UKZN consists of five campuses which are in the province of KwaZulu-Natal and the uMsunduzi and eThekweni Municipalities. The study also aimed to explore the problem of vulnerability to food insecurity across different campuses within the UKZN. Therefore, a one-way between-subjects ANOVA was conducted to determine the difference in vulnerability to food insecurity between students on different UKZN campuses. Participants were classified into their respective campuses: Pietermaritzburg ($n = 149$), Howard College ($n = 103$), Edgewood ($n = 56$), Westville ($n = 78$) and Nelson Mandela School of Medicine ($n=51$). There were no outliers, as assessed by the boxplot. There was homogeneity of variances, as assessed by Levene's test of homogeneity of variances ($p > .521$). There was variability in students' vulnerability to food insecurity across all campuses starting from Howard College ($M=1.4$, $SD=0.8$), Westville ($M=1.4$, $SD=0.9$), Edgewood ($M=1.6$, $SD=0.8$), Pietermaritzburg ($M=1.5$, $SD=0.8$) and Nelson Mandela School of Medicine ($M=1.6$, $SD=0.9$). However, differences between these campuses were not statistically significant $F(4,432) = 1.026$, $p = 0.393$. The group means were not statistically significantly different ($p > .05$). Therefore, we fail to reject the null hypothesis that there is no difference in vulnerability to food insecurity for UKZN

students across the different UKZN campuses. Table 4.7 illustrates the results from the one-way between-subjects ANOVA test.

Table 4.7: *Differences in vulnerability to food insecurity between students on different UKZN campuses.*

| Campus | Mean | SD | n |
|-----------------------------------|------|------|-----|
| Pietermaritzburg | 1.55 | 0.78 | 149 |
| Howard College | 1.41 | 0.87 | 103 |
| Edgewood | 1.61 | 0.82 | 56 |
| Westville | 1.42 | 0.93 | 78 |
| Nelson Mandela School of Medicine | 1.57 | 0.90 | 51 |

| Source | SS | df | MS | F |
|----------------|-------|----|------|--------|
| Between Groups | 2.662 | 4 | .666 | 1.026* |

* $p > .005$

4.3.3 Financial aid and vulnerability to food insecurity

As identified in Table 4.1 (see above), 45.4% of participants received financial aid from the National Student Financial Aid Scheme (NSFAS), while the remaining 54.6% was not receiving financial assistance from the NSFAS. Regarding non-NSFAS receivers, 25.1% of the participants received funding from parents/relatives, and 10.0% was self-funded. A further 8.2% received financial aid through bursaries and 7.1% through scholarships. Only 3.0% were funded through bank loans.

One respondent did not identify the source of their funding. An independent samples t-test was performed to determine a significant difference in mean vulnerability to food insecurity between students receiving financial aid from NSFAS and students not receiving financial aid from NSFAS. There were no outliers in the data, as assessed by inspection of a boxplot. The mean

vulnerability score was greater for students receiving financial aid from NSFAS ($M = 1.69$, $SD = 0.84$) when compared to students who are not receiving financial aid from NSFAS ($M = 1.34$, $SD = 0.82$). There was also a significant difference in the scores for students receiving financial aid from the NSFAS and those not receiving NSFAS; $t(435) = 4,484$, $p = .000$. Because of the significant finding, we can reject the null hypothesis for this sub-question (i.e., there is no difference in vulnerability to food insecurity when comparing students on financial aid with those not on financial aid).

Table 4.8: *Financial Aid and vulnerability to food insecurity* ($N_{NSFAS} = 199$, $N_{NO-NSFAS} = 235$)

| Funding | | | | <i>N</i> | <i>M</i> | <i>SD</i> | <i>SE</i> | <i>t</i> | <i>df</i> | <i>p</i> |
|-------------------|------|--|-----------|----------|----------|-----------|-----------|----------|-----------|----------|
| Vuln. to FI NSFAS | Mean | | | 199 | 1,69 | 0,84 | 0,06 | 4,484 | 435 | 0,000 |
| | | | Not NSFAS | 235 | 1,34 | 0,82 | 0,05 | | | |

4.3.4 Relationship between where a student resides during the semester and vulnerability to food insecurity.

A one-way ANOVA was conducted to determine significant differences between students residences and hunger. Participants were classified into their respective residences, based on their response to the questionnaire: Family/Relative ($n = 91$), UKZN Residence (UKZN owned or leased) ($n = 254$), privately leased student communed/digs ($n = 68$), I squat ($n = 05$) and Flat/Garden flat ($n=19$). There were no outliers, as assessed by boxplots. There was homogeneity of variances, as assessed by Levene's test of homogeneity of variances ($p = 0.273$). There was variability in vulnerability to food insecurity across all students' residences starting from Family/Relative ($M=1.1$, $SD=0.8$), UKZN Residence (UKZN owned or leased) ($M=1.7$, $SD=0.8$), privately leased students commune/digs ($M=1.4$, $SD=0.7$), Squat ($M=2.6$, $SD=0.5$) and in a flat/garden flat on my own ($M=1.1$, $SD=0.7$). The differences between these residences were statistically significant $F(4,433) = 15.02$, $p = .000$. Therefore, we reject the

null hypothesis and conclude that there was a difference in mean vulnerability to food insecurity scores for UKZN students and where they reside. Table 4.9 illustrates the results from the one-way between-subjects ANOVA test.

Table 4.9: *Relationship between student residence during the semester and vulnerability to food insecurity*

| Residence | Mean | SD | N |
|---------------------------------------|------|------|-----|
| Family/Relative | 1.07 | 0.84 | 91 |
| UKZN Residence (UKZN owned or leased) | 1.69 | 0.82 | 255 |
| Privately leased student Commune/digs | 1.44 | 0.72 | 68 |
| I squat | 2.6 | 0.54 | 5 |
| In a flat/garden flat on my own | 1.05 | 0.70 | 19 |

| Source | SS | df | MS | F |
|----------------|--------|----|-------|---------|
| Between Groups | 34.544 | 4 | 8.636 | 15.023* |

* $p > .005$

4.4 Conclusion

Chapter 4 presented the findings of the study. The results are based on the sample of 438 students who completed the USFIQ online and in-person. The chapter presented the demographic characteristics of the participants. Most respondents were female and identified as black African. Many participants lived in university-owned or leased residences and were funded by NSFAS. This chapter presented the descriptive and inferential findings and outlined the hypothesis testing.. The findings report a high rate of students who were either seriously food insecure or severely food insecure.

Further, it found that students employ several strategies to access food and outlines factors contributing to food insecurity. Students also suggested several ways in which UKZN can

respond to the problem of food insecurity. A statistical significance was established between food insecurity and financial aid. In contrast, no statistical significance was established between vulnerability to food insecurity and the semester's beginning or end across campuses and residences. Chapter 5 discusses the findings in detail in line with the literature.

Chapter 5 Discussion

5.1 Introduction

This study aimed to explore food insecurity among students at the UKZN. It intended to provide an updated measure of the vulnerability to food insecurity among students at the UKZN. It also explored the reasons UKZN students attribute to their food insecurity and possible strategies that UKZN could implement to respond to food insecurity among its students.

This chapter discusses the findings presented in Chapter 4 in detail with reference to the literature and theoretical framework presented in Chapter 2. The chapter is organised in accordance with the research questions explored and will consequently cover the following sections:

1. Vulnerability to food insecurity at the UKZN.
2. Strategies used by students to get food.
3. Factors contributing to students' vulnerability to food insecurity.
4. Suggestions on how UKZN could respond to the incidence of food insecurity among its students.
5. Hunger at the beginning and end of the semester and vulnerability to food insecurity.
6. The difference in vulnerability to food insecurity between students on different UKZN campuses.
7. Financial aid and vulnerability to food insecurity.
8. The relationship between where students reside during the semester and vulnerability to food insecurity.

5.2 Vulnerability to food insecurity at the UKZN

This study found that food insecurity remains a challenge at UKZN. Although 11% and 40.5% of the sample reported no or low levels of food insecurity, respectively, 48.6% of the sample experienced serious to severe levels of food insecurity. Within this 48.6%, 12.4% reported experiencing a severe level of food insecurity. As stated in Chapter 1, this research study aimed to replicate a study that explored the prevalence of food insecurity amongst university students at the University of KwaZulu-Natal (Munro et al., 2013). However, the current study extended the first study by exploring the issue across other campuses within the University of KwaZulu-Natal.

In contrast to the original study, which found a 20.8% prevalence of serious to critical levels of vulnerability to food insecurity, this study found a higher prevalence rate of 48.6% vulnerability to serious to critical levels of vulnerability to food insecurity. Munro et al.'s (2013) study only sampled students from one of the five UKZN campuses. So, the current study may provide a more comprehensive overview of vulnerability to food insecurity at UKZN (i.e., across all five campuses) and/or that levels of vulnerability to food insecurity among UKZN students have increased in the period between the two studies. Additionally, one other explanation for the increased prevalence of food insecurity in the current study could be that the issue has become more known across South African and global institutions of higher learning. Therefore, it is possible that there is more awareness around the issue and that students feel more comfortable (and/or less ashamed) to come forward and express the extent to which they experience food insecurity. Recent national movements, such as the *#RhodesMustFall* and *#FeesMustFall*, may have also influenced students comfort with expressing their study-related challenges, with this movement seeing students protesting fee increments and asking for more support from the government.

In contrast to the Munro et al. (2013) study, the results from the current study are more consistent with a more recent study at UKZN, which found approximately 53.1% of the students being vulnerable to food insecurity (Sabi et al., 2020). Although not necessarily generalisable to other universities, the results suggest increasing levels of student hunger which leads to food insecurity. The challenge of food insecurity in institutions of higher learning may pose a challenge to student academic success as students may be unable to concentrate on their studies due to hunger (Weaver et al., 2020). As the Bill of Rights highlights the right to have access to sufficient food and water, it is essential for students at institutions of higher learning from all financial and socio-economic backgrounds to have access to food to progress and succeed academically (*Constitution of the Republic of South Africa*, 1996).

In this current study, more black African students completed the questionnaire (85.2%) (see Table 4.1). Based on the intended proportion of surveying approximately 71% of the black African students (see Chapter 3), the study may have over-sampled this group of students. Over and under-sampling was not done purposively and simply reflects the population of students who were available and willing to complete the survey when the researcher was on campus and those interested in completing the questionnaire online. Unfortunately, this study did not explore the issue of vulnerability across demographic characteristics such as gender, other forms of funding (i.e. such as bursaries, loans, self-funded), study level, college of study as other studies did (Sabi et al., 2020; Van den Berg & Raubenheimer, 2015).

5.3 Strategies used by students to get food.

The previous section discussed food insecurity among UKZN students as measured by the USFIQ. The results revealed that the problem of food insecurity is still prevalent at UKZN and may be at a higher rate. When students experience food insecurity, they may need to navigate strategies to help them access food. The results presented in Table 4.3 (see Chapter 4) indicate some of the strategies students at UKZN employ to access food. As shown, students employ

several techniques to navigate food access. Students' most common strategy was asking their families for money or food. Several students used their social networks, such as friends, for food. These results are consistent with those reported in an American study which found that many students rely on their social networks such as friends or roommates for food whenever they are hungry (Watson et al., 2017).

Not many students used services such as asking UKZN to Student Support Services, which may be because students are unaware of such available services within the institutions or organisations that help students with food. Navigating strategies to access food is not a new phenomenon. As mentioned above, an American study found that more than half of their sample indicated that they attend functions and events to get free meals (Watson et al., 2017); however, this strategy was not reported in the current study. Besides the financial aid scheme provided by the government, several higher education institutions have established initiatives to address the problem of hunger. In 2012 UKZN established a food support programme to support students who reported a need for food at the institution (Sabi et al., 2018). The primary objective of this programme was to provide counselling and support to students by providing them with vouchers and food hampers and creating awareness about food insecurity and the implications of this for a student academic performance (Sabi et al., 2018).

This current study found a low number of students who highlighted taking food from someone else without asking. Devereux (2018) highlighted that students in South Africa find ways to cope with food insecurity and hunger, including eating with friends, roommates, or relatives. They also limit their consumption by drinking fluids, fasting, or eating cheaper, less nutritional food. The strategies of limiting consumption by drinking fluids, fasting, or eating more affordable, less nutritious food help students temporarily alleviate hunger, but they do not serve as a long-term solution. There is a need for institutions of higher learning to provide strategies

for students to make use of available services that assist with food access permanently rather than temporarily

5.4 Factors contributing to students' food insecurity

Understanding factors contributing to students' food insecurity was important in this study as this was going to set out the predictors of food insecurity among students. Participants were asked to indicate the possible reasons on a 5-point scale that could account for why a university student might experience hunger. The results show that several factors contribute to students' food insecurity. Factors that stood out were finance-related, such as having a limited income to cover a wide range of expenses, including food. About 42.2% of the participants reported going hungry in the semester because they finished their food allowance before the next one was put in their accounts.

Additional factors included students reporting that their families could not provide enough money to buy food. A study at the University of Free-State found that these factors were predictors of food insecurity (Van den Berg & Raubenheimer, 2015). These predictors highlight the financial difficulties university students face, resulting in students limiting their food consumption or eating cheaper, less nutritional food. There is a need for interventions that will include teaching students about eating nutritious food even on a limited budget and financial literacy. Other factors not widely reported were money being stolen or spending money on transport, and this could be because students living off-campus are closer to the university, where they do not take transportation to campus.

5.5 Students' suggestions on how UKZN could respond to the incidence of food insecurity among its students.

This study also explored possible suggestions UKZN could use to respond to food insecurity amongst students. 63% of the students suggested that UKZN enhances student employment opportunities, and a further 42% indicated that the institution enhances financial aid meal

allowances. These results reiterate the financial challenge faced by students mentioned above. The institution offers short-term employment students as tutors' mentors or junior lecturers at more senior levels. Therefore, students' employment may not be suitable for all the students at all levels, primarily undergraduate levels.

Regarding financial aid, research studies have recommended improving financial assistance, and evidence shows that in many institutions of higher learning, students are funded by financial aid (Munro et al., 2013; Sabi et al., 2018; Van den Berg & Raubenheimer, 2015). However, it is possible that the current food allowance provided by NSFAS is not enough for students to meet their day-to-day needs, including buying nutritious food and other means are required. Approximately 49% of the students suggested food vouchers, while 43% suggested food parcels. Even though the solution of using food parcels and food vouchers is temporary, it may assist with the issue of student food insecurity. Additional suggestions included emphasising the importance of investing in food more than other priorities such as clothes. These results suggest a need to assist students in various ways that they are comfortable with to alleviate food insecurity.

5.6 Financial aid and vulnerability to food insecurity

Previous studies have found that students on financial aid were more vulnerable to food insecurity (Munro et al., 2013; Sabi et al., 2020; Van den Berg & Raubenheimer, 2015). This study sample included 45.5% of students funded by NSFAS. The remaining 54.5% received funding through self-funding, bank loans, and bursaries. Other students indicated that they did not have funding for their studies because they were deemed ineligible to receive funding. The results from this study concur with these previous studies as a statistically significant difference was found between students receiving financial aid from the NSFAS and students who are not receiving NSFAS. The NSFAS programme in South Africa funds students from economically challenged backgrounds, and students are supported based on the household combined income.

This was an expected finding as the demographics indicate that almost half of the sample were funded by NSFAS (45.4%). A likely cause may be associated with the fact that students use their food allowance to buy other things such as stationery or cosmetics, printing/photocopying costs or sending money home instead of enough food.

Table 4.4 in Chapter 4 indicate 43% of the sample used their allowance to buy other things such as stationaries and other priorities such as printing or photocopying. It is also shown that the allowance was not enough and was finished before the next one could come in. This may indicate that the allowance received may not be enough to cover expenses apart from food. Students must compromise and meet other needs using the allowance they receive from NSFAS even though the allowance is specifically for food. Other studies have found that NSFAS allowances are inadequate to support students with their day-to-day needs (Kassier & Veldman, 2013; Munro et al., 2013; Van den Berg & Raubenheimer, 2015).

5.7 Hunger at the beginning and end of the semester and vulnerability to food insecurity

The hypothesis that students were more hungry at the end of the semester than at the beginning of the semester was drawn from the previous study by Munro et al. (2013), which compared the consistency of food insecurity across the semester. The current study found no significant difference in hunger at the end of the semester and the beginning of the semester. The results are contrary to the previous research, which found the likelihood of vulnerability to food insecurity at the end of the semester than at the beginning of the semester (Munro et al., 2013). Given that the current research results reported no significant difference at the end of the semester than at the beginning of the semester, students may experience vulnerability to food insecurity throughout the semester, impacting their mental functioning. Studies have found that students are hungrier at the end of the semester compared to the beginning (Bruening et al., 2018; Munro et al., 2013). Hunger towards the end of the semester or near exams may result in students' lack of concentration, which may affect the

student's concentration and fatigue (Weaver et al., 2020). Previous research has emphasised balanced nutrition for concentration and energy (Van den Berg & Raubenheimer, 2015)

5.8 The difference in vulnerability to food insecurity between students on different UKZN campuses.

A one-way between-subjects ANOVA found no significant difference in vulnerability to food insecurity across different campuses. This was based on the hypothesis that students on different campuses experience food insecurity. The UKZN has five campuses, namely Pietermaritzburg, Howard College, Edgewood, Westville, and Nelson Mandela School of Medicine. The results could indicate that students across campuses, regardless of their geographic location, may be similar in terms of being food insecure. There are no known studies conducted in South Africa that have been conducted exploring the difference in student hunger or food insecurity across different campuses or cross-institutional studies. Most studies focused on a single institution or single campus sample. One study conducted in the United States found a difference in the prevalence of food insecurity at the University of Tennessee, reporting 25.0% compared to West Virginia University, which reported 7.1% (El Zein et al., 2019). The results reveal that students from other campuses may equally experience food insecurity, and the problem of food insecurity among students cannot be limited by geographical location. There is a need for more research studies that will closely examine the problem of food insecurity across institutions or campuses within the country.

5.9 Relationship between where a student resides during the semester and his/her vulnerability to food insecurity.

To determine the relationship between student residence during the semester and vulnerability to food insecurity, the study carried out an ANOVA test that reported no statistically significant difference in student vulnerability to food insecurity. UKZN offers several on and off-campus self-catering residential facilities. Students living around the area where the institution is based

live with family or relatives, and others are renting private accommodation, which UKZN leases some. 58.2% of the sample were staying at UKZN owned/leased residences 20.8% were living with family or relatives. These results indicated that students' places of residence might be similar in vulnerability to food insecurity.

A study conducted at the University of Hawai'i found that students living in on-campus and off-campus student residences were more likely to be food insecure than were students living with parents (Pia Chaparro et al., 2009). A study found an association between where students reside and food insecurity (El Zein et al., 2019). Another study conducted at Deakin University reported that 30% of the students were severely food insecure, and 60 % were not living with their families (Micevski et al., 2014). Although the current study result was not consistent with the results reported in other studies, it is evident that students living with their families or living at UKZN owned or leased residents and privately rented accommodation can experience food insecurity. This may be influenced by availability, access, utilization and stability of food security (Barrett, 2010)

Chapter 6 Conclusions

Introduction

Globally, research on food insecurity at institutions of higher learning has revealed the problem of a basic need that many students face daily. In South Africa, there is limited research investigating the issue of food insecurity amongst students at institutions of higher learning. However, research that has been conducted at South African higher learning institutions has demonstrated the rising threat of vulnerability to food insecurity amongst students. These studies have found several factors influencing the problem of food insecurity where financial factors are predominantly highlighted. Despite the efforts by the South African government and academic institutions to address the issue of vulnerability to food insecurity at universities, the problem persists. This study aimed at assessing the vulnerability of food insecurity amongst students at the University of KwaZulu-Natal. This is done using a non-experimental survey research design which generated quantitative data.

This study sampled 438 students from all five campuses under the University of KwaZulu-Natal who were studying towards their undergraduate degrees or postgraduate qualifications except for first-year students. The objectives of the study were to (1) provide a current measure of vulnerability to food insecurity among students at all the UKZN campuses, (2) explore the reasons that contribute to UKZN students' food insecurity and (3) to identify students' suggestions regarding what UKZN could do to respond to food insecurity among UKZN students. The University Students Food Insecurity Questionnaire was administered to the prospective participants to complete either online or manually willing participants. Descriptive and inferential statistics, along with hypothesis testing was presented and discussed.

This chapter will present a summary of the research questions and results. Additionally, it will discuss the study's limitations, provide recommendations, and conclude by describing the implications for future research.

Summary of research questions and results

The presentation of the results was divided into two sections, descriptive and inferential. Descriptive statistics provided a summary of the sample and were further used to understand the prevalence of food insecurity at UKZN, including summaries of strategies used by students to access food, factors contributing to student's vulnerability to food insecurity and suggestions on how UKZN could respond to the incidence of food insecurity among its students. Inferential statistics presented predictive results to determine if there were significant differences in vulnerability to food insecurity between students receiving financial aid and those who are not, beginning of the semester and end of the semester, campuses, and residences.

The study wanted to find the prevalence of vulnerability to food insecurity among UKZN students. The results suggested a problem of vulnerability to food insecurity at UKZN. The increasing concern in students' hunger leads to food insecurity among institutions of higher learning. This may challenge students' academic success as students require energy to concentrate on their studies (Munro et al., 2013). It is therefore essential for students at institutions of higher learning from all financial and socio-economic backgrounds to have access to food for them to progress and succeed academically (Munro et al., 2013)

The study also wanted to determine if UKZN students were more likely to be hungry at the end of a semester (near exams) than at the beginning of a semester. The results showed no difference in hunger at the end of the semester or near exams and the beginning of the semester. The results suggested that students may experience hunger from the beginning to the end of the semester, impacting their mental functioning. Studies have emphasised the importance of balanced nutrition for concentration and energy.

The difference in vulnerability to food insecurity between students on different UKZN campuses was examined. The analysis revealed that students from other campuses may equally experience vulnerability to food insecurity, and the problem cannot be limited by geographical

location. Considering this study as the first to explore the problem of food insecurity across campuses within the university institution, there is a need for more research studies that will closely examine the problem of food insecurity across institutions or campuses within the country.

An exploration was done to determine if students receiving financial aid were more vulnerable to food insecurity than those not on financial aid. Students not on financial aid consist of those who have bursaries, are studying on loan, and are self-funded, including those who are not funded. The results confirmed that students on the National Financial Aid Scheme (NSFAS) were more vulnerable to food insecurity when compared to students who are not financial aid. These results were consistent with other studies that have explored the problem of food insecurity in students who are receiving financial aid. The results also suggest a need for intervention on students receiving NSFAS. Looking at the number of students receiving NSFAS, it could be argued that amongst other possible reasons for this are delayed NSFAS payments or abruptly spending allowances to buy other things beside food.

A further analysis was conducted using ANOVA to find the relationship between students' residence during the semester and their vulnerability to food insecurity. The results from this study revealed no significant difference in vulnerability to food insecurity and suggested that students may be vulnerable to food insecurity despite their places of residence. Areas of residence included UKZN owned or leased residences, squatting, or staying at home. There was limited literature found on studies that explored the problem of food insecurity across residences

To understand factors that contribute to food insecurity, a question exploring what UKZN students identify as contributing to their food insecurity was asked. The study found several reasons, which included spending money on other priorities, finishing their allowances early and that the allowance was not enough to cover their food expenses. Most of the factors were finance-related, which indicated that the allowances provided to students were not enough to

cover all student's day today expenses.

The study explored different suggestions by UKZN students which UKZN could respond to the incidence of food insecurity among its students. Most students highlighted the need to enhance students' employment opportunities. The institution offers short- and long-term employment to students qualifying as tutors, mentors, or other academic-related opportunities. However, these opportunities are limited to students who mostly do their post-graduate qualification. This could pose a challenge as only post-graduate students may benefit from these, excluding undergraduates. Furthermore, students suggested food vouchers and food parcels.

An analysis of strategies that students use to find food was explored to investigate the most prevalent methods students use to navigate hunger. The results suggested that students mostly rely on families for money to buy food. The study also found that students made less use of their social networks to access food; this was an uncommon finding studies have shown that the most common strategy employed by students to get food was through friends and other fellow students in the form of sharing groceries or combining allowance to buy more food. Although services to assist students with problems hunger in the institution, students made little use of these services, which could mean that the visibility of these services is not enough for students to know about them.

These conclusions have indicated that food insecurity is still a significant phenomenon in the UKZN that requires students to perform well and the institution's reputation. Finances were found to be the central problem that led to students vulnerability to food insecurity. Factors that may have contributed to this escalating challenge could be the rising cost of food. This indicates the need for enough allowances for students receiving NSFAS and an understanding of dietary recommendations.

Limitations of the study

Although attempts to collect data across all campuses at UKZN were made, the study only sampled 1% of the student population at UKZN. Some campuses had more participants; thus, the results may not be generalizable fully to the entire student population given purposive sampling. The study used a quantitative research method, using a close-ended questions questionnaire. Therefore, the study's findings do not reflect in-depth information about students' perceptions and perspectives regarding food insecurity at UKZN. Although we indicate that first-year students were technically excluded in the data collection process, participants could complete the questionnaire online. As a result, first-year students may have completed the questionnaire to enter the voucher draw. Furthermore, the study only was limited to exploring the problem of food insecurity amongst university students in general. Although it would have been useful to make a comparison between undergraduate and postgraduate students considering that funding opportunities are widely available to postgraduates, it was not within the scope of the study to investigate.

Recommendations

While there is still limited research on food insecurity among students in South Africa, further research is recommended. Firstly, there is a need for large research studies to explore the prevalence of food insecurity across an entire institution to achieve generalizability. There is a need for institutions of higher learning to be visible with the initiatives they run that seek to help student with the problem of hunger. A need for NSFAS to revise its plan of supporting students is also recommended. This work further advocates for the Department of Higher Education to further revise its policies with regards to providing allowances that are in line with the current inflation rates for financially needy students and collaborating with institutions, also prioritize assisting with establishing sustainable initiatives to address the issue of food insecurity such as hosting webinars about budgeting workshops and finding programmes that help students who

are food insecure. Qualitative research studies may be useful to reflect in-depth understanding of factors contributing to food insecurity amongst university students. It is also recommended that future studies assess the problem of food insecurity between undergraduate and postgraduate students.

Conclusion

This chapter provided a concluding summary of the main findings, highlighting the research study's importance. An overview of the limitations was supplied, including recommendations for future research, UKZN campaigns, and NSFAS. The need for further research is very important as it will provide solid evidence about the problem of food insecurity which can thus influence policies for the DHET in South Africa.

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Appendices

Appendix 1: Turnit Report

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------|----------------|
| Lindani Msimango | | | |
| ORIGINALITY REPORT | | | |
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Appendix 2: University Students Food Insecurity Questionnaire

University Students Food Insecurity Questionnaire (USFIQ)

Dear UKZN Student.

It has been found that some students have difficulty in regularly obtaining food, otherwise known as being food insecure. In urban contexts, food insecurity refers to the limited or uncertain ability of certain people (or groups of people) to access acceptable foods in socially acceptable ways.

I am a masters student at UKZN who is interested to understand the extent and experience of food insecurity among UKZN students. This understanding may assist UKZN in assessing the extent of food insecurity among its students, and in exploring ways to assist food insecure students. A University Students Food Insecurity Questionnaire (USFIQ) was developed to assist UKZN to do this. Please, could you take a few minutes to complete the questionnaire?

Please note:

- Completing this questionnaire is voluntary.
- Please only complete the questionnaire after you have read and understood the participant information sheet and signed the informed consent. If you have questions arising from the questionnaire or the study, you may ask the questionnaire administrator or email Lindani Msimango on 211523318@stu.ukzn.ac.za or lindani.tfbcso@gmail.com
- Please do not write your name on the questionnaire since we want to ensure confidentiality.
- **If you have completed the survey before**, we ask that you complete it again. But tick the block that says: *“Yes, I have completed this questionnaire before”*.

PLEASE BE HONEST IN YOUR RESPONSES.

NOTE: If you or any of your fellow students are struggling to access food regularly, please consult with (or refer your fellow students) to: A student counselor at your relevant College Office; go directly to the campus clinic or HIV Programme office or Student Support Services offices. These departments will assist you accordingly.

1. Biographical Questions

| | | Yes | No |
|------|----------------------------------------------------|-----|----|
| 1.1. | Have you already completed out this questionnaire? | | |

| | | Male | Female | Neither |
|------|------------------------------------|------|--------|---------|
| 1.2. | Which gender do you identify with? | | | |

| | | South African | Refugee | International |
|--------------------------------------------------------------------|---------------------------|---------------|---------|---------------|
| 1.3. | What is your nationality? | | | |
| If “refugee or international”, please specify home country: | | | | |

| | | Indian | Black | Coloured | White | Other |
|------------------------------------|--------------------|--------|-------|----------|-------|-------|
| 1.4. | What is your race? | | | | | |
| If “other”, please specify: | | | | | | |

| | | PMB | Howard College | Edgewood | Westville | Medical School |
|------|-------------------------------------|-----|----------------|----------|-----------|----------------|
| 1.5. | Which campus do you study at? | | | | | |
| 1.6. | What degree are you registered for? | | | | | |

1.7. Where do you stay during the university term/semester?

| | |
|-----------------------------------------|--|
| Family/Relative | |
| UKZN residence (UKZN owned or leased) | |
| Privately leased students’ commune/digs | |
| I squat | |
| In a flat/garden flat on my own | |
| Other | |
| If “other”, please specify: | |

1.8. How do you **primarily** fund your studies? (Select all that apply)

| | |
|------------------------------------|--|
| Financial Aid (NSFAS) | |
| Self-Funded (Parents/Family) | |
| Self-funded (own funds) | |
| Bursary | |
| Scholarship | |
| Bank loan | |
| Other | |
| If “other”, please specify: | |

2. Questions about food insecurity

For the following questions, choose the option that best describes your circumstance.

Please cross/tick one, where:

Never - That has never occurred

Seldom - A few times a month or less

Sometimes - A few times per week

Often - Most days of the week

Almost always - Daily

| | Question | Never | Seldom | Sometimes | Often | Almost always |
|-------|-----------------------------------------------------------------------------------------------------------|-------|--------|-----------|-------|---------------|
| 2.1. | Do you eat breakfast when you wake up? | | | | | |
| 2.2. | Do you eat lunch during the day? | | | | | |
| 2.3. | Do you eat supper/dinner at night? | | | | | |
| 2.4. | How often do you buy takeaway food? (i.e., Pizza, KFC, Burgers)? | | | | | |
| 2.5. | How often do you eat a smaller meal than you felt you needed because there is not enough food? | | | | | |
| 2.6. | How often do you eat fewer meals in a day because there is not enough food? | | | | | |
| 2.7. | How often do you eat cheaper foods because there is not enough money for food? | | | | | |
| 2.8. | How often do you eat the same foods for several days in a row because there is not enough money for food? | | | | | |
| 2.9. | How often do you not eat at all because there is not enough money to buy food?? | | | | | |
| 2.10. | How often do you struggle to concentrate in class and/or while you are studying because you are hungry? | | | | | |

| | Question | Never | Seldom | Sometimes | Often | Almost always |
|-------|------------------------------------------------------------------------------------------------------------------------|-------|--------|-----------|-------|---------------|
| 2.11. | How often do you feel weak (i.e., tired) because you are hungry? | | | | | |
| 2.12. | How often does hunger affect your mood? | | | | | |
| 2.13. | How often do you miss lectures/tutorials because you are hungry? | | | | | |
| 2.14. | How often do you feel that your health suffers because you don't get enough food or because you don't eat enough food? | | | | | |
| 2.15. | How often do you worry where your next meal will come from? | | | | | |
| 2.16. | How often do you go hungry at the beginning of the semester? | | | | | |
| 2.17. | How often do you go hungry at the end of the semester or during exams? | | | | | |
| 2.18. | How often do you go 24 hours without eating because you did not have enough money for food? | | | | | |

| | Question | 0 days | 1 days | 2 days+ | A week+ |
|-------|---------------------------------------------------------------------------------------------------------------------------|--------|--------|---------|---------|
| 2.19. | What is the longest period that you have had to go without food during a semester because you didn't have money for food? | | | | |

| | | |
|-------|-----------------------------------------------|---|
| 2.20. | How much do you usually spend on food a month | R |
|-------|-----------------------------------------------|---|

| | Question | Financial Aid | Parents/ Family | Part-time work | Bursary | Scholarship | Bank loan | Self-funded |
|-------|-------------------------------------------------------------|---------------|-----------------|----------------|---------|-------------|-----------|-------------|
| 2.21. | Where do you get money for food? (Select all that apply) | | | | | | | |

3. How often do you do the following to get food?

| | Source of food | Never | Seldom | Sometimes | Often | Almost always |
|------|-------------------------------------------------|-------|--------|-----------|-------|---------------|
| 3.1. | Ask your family for food/money | | | | | |
| 3.2. | Ask friends for food | | | | | |
| 3.3. | Borrow extra money from friends | | | | | |
| 3.4. | Ask Student Support Services for food | | | | | |
| 3.5. | Go to a soup kitchen (e.g., Salvation Army) | | | | | |
| 3.6. | Take food from someone else without asking | | | | | |
| 3.7. | Do something in exchange for food (i.e., favor) | | | | | |
| 3.8. | Exchange a sexual favor for food | | | | | |
| 3.9. | Ask a lecturer for food | | | | | |
| 3.10 | Other, please specify: | | | | | |

4. If you found you were often hungry during the semester, indicate how often each of the following was the reason for being hungry.

| | Questions | Never | Seldom | Sometimes | Often | Almost always |
|------|-------------------------------------------------------------|-------|--------|-----------|-------|---------------|
| 4.1. | I was trying to eat less so that I could lose weight | | | | | |
| 4.2. | My food allowance or money was not enough | | | | | |
| 4.3. | My family could not provide enough money for me to buy food | | | | | |
| 4.4. | I did not receive money I expected from my family | | | | | |
| 4.5. | I did not receive a financial aid meal allowance | | | | | |

| | Questions | Never | Seldom | Sometimes | Often | Almost always |
|-------|----------------------------------------------------------------------------------------|-------|--------|-----------|-------|---------------|
| 4.6. | I finished my food allowance before the next one was put into my account | | | | | |
| 4.7. | I spent my food money on other priorities (e.g., clothes, airtime, entertainment etc.) | | | | | |
| 4.8. | I spent my food money on transport. | | | | | |
| 4.9. | spent my food money on stationery, books photocopying | | | | | |
| 4.10. | I sent some of my meal allowance home | | | | | |
| 4.11. | I shared my food allowance with another student. | | | | | |
| 4.12. | I had my food/money stolen | | | | | |
| 4.13. | I paid off debt (e.g. outstanding fees) with my food allowance | | | | | |
| 4.14. | I lent money to others | | | | | |
| 4.15. | I spent my money too quickly | | | | | |
| 4.16. | Other, please specify: | | | | | |

5. In your opinion, what could UKZN do to help students who don't have regular access to food?

| | |
|----------------------------------------------|--|
| Create Awareness about food insecurity | |
| Food parcels | |
| Food vouchers | |
| Food bank on campus | |
| Enhance student employment opportunities | |
| Budgeting and financial management workshops | |
| Reassess and enhance fin aid meal allowance | |
| Any other suggestions: | |

Appendix 3: Ethics Approval



17 August 2017

Mr Lindani Innocent Msimango 211523318
School of Applied Human Sciences
Howard College Campus

Dear Mr Msimangi

Protocol reference number: HSS/0854/017M

Project Title: Vulnerability to food insecurity among students: A quantitative study at the University of KwaZulu-Natal

Full Approval – Full Committee Reviewed Protocol

In response to your application received 21 June 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully



Dr Shamila Naidoo (Deputy Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

cc Supervisor: Dr Nicholas Munro
cc Academic Leader Research: Dr Mary Van Der Riet
cc School Administrator: Ms Nondumiso Khanyile

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/63504557 Facsimile: +27 (0) 31 260 4609 Email: yimbep@ukzn.ac.za / soumarco@ukzn.ac.za / mohunp@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix 4: Gatekeepers Approval



2 May 2017

Mr Lindani Innocent Msimango (SN 211523318)
School of Applied Human Sciences
College of Humanities
Pietermaritzburg Campus
UKZN
Email: 211523318@stu.ukzn.ac.za.

Dear Mr Msimango

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN), towards your postgraduate degree, provided Ethical clearance has been obtained. We note the title of your research project is:

"The problem of food insecurity among students: A quantitative study at the University of KwaZulu-Natal".

It is noted that you will be constituting your sample by handing out questionnaires to students on all Campuses.

Please ensure that the following appears on your notice/questionnaire:

- Ethical clearance number;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

You are not authorized to contact staff and students using 'Microsoft Outlook' address book. Data collected must be treated with due confidentiality and anonymity.

Yours sincerely

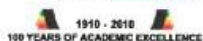
MR S S MOKOENA
REGISTRAR

Office of the Registrar

Postal Address: Private Bag X54001, Durban, South Africa

Telephone: +27 (0) 31 260 8005/2206 Facsimile: +27 (0) 31 260 7824/2204 Email: registrar@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix 5: Information Sheet and Informed Consent

Dear UKZN student

Participant Informed Consent

Vulnerability to Food Insecurity among university students: A quantitative study at the University of KwaZulu-Natal.

My name is Lindani Msimango; I am a student at the University of KwaZulu-Natal in Pietermaritzburg, studying towards a Masters in Research Psychology. I am conducting research on Food Insecurity among students at the University of KwaZulu-Natal. The results of the study may assist in exploring the prevalence of food insecurity in Higher Education institutions and also finding ways in which more awareness may be created regarding the issue of food insecurity among students. As a student at the UKZN you are therefore invited to participate in the study on this topic.

University Student Food Insecurity Questionnaires (USFIQ) will be administered, completing the questionnaire is voluntary and it is anonymous, therefore, to ensure confidentiality please do not write your name. If you have completed the questionnaire online or manually, I ask that you complete it again. In filling the questionnaire, I kindly urge that you be as honest as possible in your responses. Filling in the questionnaire should not take you more than 15 minutes.

There are no incentives or imbursements attached to filling the questionnaire, you are allowed to withdraw from the study process should you feel uncomfortable completing the questionnaire. Moreover, there are no censures attached to you refusing to participate.

The questionnaires will be stored in a secure location for a period of five years, after which they will be destroyed. The data will be used for postgraduate student dissertations and journal publications. Should you have any queries about the study, you are more than welcome to contact me at a below mentioned information.

Thank you.

Lindani Innocent Msimango

Discipline of Psychology, School of Applied Human Sciences

University of KwaZulu-Natal

Cell: 083 7560 700

Email: 211523318@stu.ukzn.ac.za

Declaration:

I _____ (full names) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participate in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

Signature of participant _____ Date: _____