

**FOOD INSECURITY AND RELATED COPING STRATEGIES AMONG
UNDERGRADUATE STUDENTS AT THE UNIVERSITY OF
KWAZULU-NATAL, PIETERMARITZBURG CAMPUS**

**BY
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DECLARATION OF ORIGINAL WORK

I, Poinoosawmy Padmini Shivani, student number 211513492, declare that the entirety of the work submitted to the University of KwaZulu-Natal, School of Agricultural, Earth and Environmental Sciences contained in this document is my own original work. Where other sources have been used they have not been copied and have been properly acknowledged. The work in this dissertation has not been submitted for any degree before or, to any other tertiary institution by me or any other person.

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The supervisors were Professor Frederick J Veldman and Dr Susanna M Kassier.

As supervisors of the candidate, we agree to the submission of this dissertation.

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ABSTRACT

Background: As a country, South Africa could be viewed as food secure. However, a substantial number of households in the country are food insecure. Education is commonly viewed as an opportunity for improving human and social resources. However, at 15% per annum, the South African university graduation rate is globally one of the lowest. As a significant number of South African students enrolling in tertiary education come from previously disadvantaged households characterised by social and economic adversity, the relationship between the latter and low university throughout rates cannot be overlooked.

Objective: The purpose of this study was to investigate food insecurity and related coping strategies among undergraduate students enrolled at the University of KwaZulu-Natal, Pietermaritzburg campus.

Design: A cross-sectional descriptive study design was chosen.

Setting: Main, life science and commerce campuses of the University of KwaZulu-Natal, Pietermaritzburg campus were used as setting for the study.

Subjects: Subjects included for this study were registered undergraduate students on financial aid and non-recipients of financial aid (N=800).

Methods: Data collection was conducted by means of a questionnaire developed for the purpose of the study in addition to a modified version of the HFIAS as well as an adapted version of the Coping Strategy Index.

Results: The mean age of the study sample was 20.5 ± 2.0 years. The gender distribution was 41.1% males and 58.9% females. The mean BMI of the study sample was $24.3(\pm 4.8)$ kg/m² with 35.8% of the study sample being overweight and obese. Female students had a higher prevalence of overweight (25.1%) and obesity (19.5%) when compared to males, who had a 16.1% prevalence of overweight and 7.0% obesity rate. Over half (54.3%) of participants were non-recipients of financial aid, while 45.8% students were on financial aid. Of the latter, 72.1% were sponsored by NSFAS. During term, 41.6% students lived at student residence, followed by who 32.5% resided at off campus accommodations and 25.9% living at home.

Nearly two thirds (60.0%) of students were trying to find a part time job while studying of which 17.3% found employment. Three quarters (75.9%) received an additional source of income of which, 69.4% were not on financial aid and 30.6% were on financial aid. It was reported that 17.6% of students were assisting their families/friends/partner financially. Of the latter sub-sample, 87.2% were on financial aid. Students' weekly food expense was R132.96. More than half (57.9%) the students were found being the hungriest at the end of the semester and close to/during exam time and at midday or mid-afternoon, with a higher prevalence of these reports coming from students on financial aid (28.0%). More than four out of ten (43.4%) students reported not having enough money for food of which, 55.0% were on financial aid. It was reported that 77.0% of the students were not able to eat a variety of food due to the lack of financial resources with 54.2% of students reporting this shortage occurring at every month end. As far as students who resided in student residence were concerned, 73.0% had their food stolen. The most frequently consumed foods included starchy food (bread, rice, maize-meal, samp, potato and pasta), fats (cooking oil, margarine and mayonnaise), tea, coffee, breakfast cereals and porridge, chicken, eggs and salty snacks. The frequency of consuming fruit was higher than that of vegetables, despite the consumption of both fruits and vegetables being low. More than seven out of ten (72.4%) students were facing food insecurity. While those on financial aid were more likely to be food insecure when compared to non-recipients of financial aid, 77.6% of the study sample limited the variety of their food consumed. The three most severe conditions of food insecurity (running out of food, going to bed hungry because there is no food and, going the whole day and night without food), were experienced by 12.5% of the students. In order to cope with food insecurity and lack of food, the three most frequently used coping strategies were borrowing money (66.5%), borrowing food (34.5%) and selling assets (19.3%). Significantly more students on financial aid adopted coping strategies when compared to those who were not on financial aid.

Conclusion: Overweight and obesity was more prevalent among food insecure females than males. There was a lack of dietary diversity among the study sample; especially students on financial aid who faced a high prevalence of food insecurity. Food insecurity and the concomitant coping strategies adopted by students affect their physical and emotional well-being and this may hinder their academic performance. Hence, sustainable remedial measures should be implemented to address food security among undergraduate students registered for study at the Pietermaritzburg campus of University of KwaZulu-Natal

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CHAPTER 1: INTRODUCTION, THE PROBLEM AND ITS SETTING

1.1 Background regarding the importance of the study

Globally, South Africa finds itself to be amongst countries that have the highest rate of unequal distribution of wealth in comparison to other middle income countries, as it has an extremely high level of absolute poverty (Altman, Hart & Jacobs 2009). Although as a country, South Africa could be termed food secure, a vast number of households are food insecure. In order to solve this problem, it would have been ideal to increase employment opportunities which in turn would have improved household income. However, although job opportunities have increased since the mid-1990s, it has not been sufficient enough to significantly reduce poverty levels (Altman *et al.* 2009).

To combat food insecurity, financial security is fundamental. Hence, the South African government foresees investment in education as an approach to eliminate poverty and increase economic growth (Letseka & Maile 2008). Education is commonly seen as an opportunity for improving human and social resources for a fulfilling productive life (Hughes, Donaldson, Serebryanikova & Leveritt 2011; Ngidi 2010). The South African constitution ascribes to education as one of the basic human rights. Hence, the government is obliged to ensure accessibility and availability of education to the population in order to achieve the bill's objective. However, at 15% per annum, the South African university graduation rate is one of the lowest in the world (Letseka & Maile 2008).

According to the South African National Health and Nutrition Examination Survey (SANHNES-1) study, it was found that 6% of those surveyed had no level of education, 33% attended high school, 20% completed matric and only 8% had a tertiary level of education (Shisana, Labadarios, Rehle, Simbayi, Zuma, Dhansay, Reddy, Parker, Hoosain, Naidoo, Hongoro, Mchiza, Steyn, Dwane, Makoe, Maluleke, Ramlagan, Zungu, Evans, Jacobs & Faber 2013). Even though South Africa perceives endowing education as being a budding prospect in the long run, there are aspects such as food insecurity, unemployment issues and poor academic performance that persist in hindering the country's progress. A significant number of South African students enrolling in tertiary education come from previously disadvantaged households characterized by social and economic adversity that cannot be overlooked (Naidoo 2008; Letseka 2007). 'Baggage' is a suitable equivalent that can be

employed to describe students who come from such disadvantaged backgrounds (Atherton 2011). This 'baggage' originates from the students' backgrounds which directly or indirectly affect the student's academic progress (Letseka 2007). Some aspects that affect this 'baggage' are financial problems, domestic problems, environmental exposure, accommodation challenges and food insecurity amongst other factors (Naidoo 2008). The 'baggage' experienced vary from one student to another, depending on their personal experiences and as a result, so do the coping strategies they adopt (Atherton 2011). Universities are facing high dropout rates, amplifying the incidence of failed courses and rising numbers of students on probation and at risk of academic exclusion, due to these complexities. It is therefore important to investigate the complexities which arise when students enrol at a tertiary institutions (Sekhukhune 2008). The Human Sciences Research Council (HSRC) in 2004 reported that 35% (14 million people) of the South African population were considered to be susceptible to food insecurity (De Klerk, Drimie, Aliber, Mini, Mokoena, Randela, Modiselle, Vogel, De Swardt & Kirsten 2004). At university level, students are expected to address their 'baggage' in the quest of education. However, it is essential to deal with socio-economic factors that influence students' food security and academic performance should the country wish to see a positive outcome related to the investment it is making towards education.

Financial aid is available to students willing to complete their undergraduate studies. Among all the requirements needed to qualify for financial aid, the following are essential; the students need to be South African citizens, must be registered at the tertiary institution and have a family's annual income below R160 000 (Anon 2015a). This assistance would increase their employment opportunities and as a result, they would be food secure and economically independent (Innes-Hughes, Bowers, King, Chapman & Eden 2010). Even though the South African Government provides financial assistance to students via the National Student Financial Aid Scheme (NSFAS), it has been indicated that the fund provided is insufficient to cover the cost of tuition fees, university necessities, transport, accommodation and food. This results in a significant number of students being food insecure (Department of Higher Education and Training 2011).

Food insecurity weakens the primary purpose of higher education which aims to enhance human and social capital, and in doing so improving the population's socio-economic status (Innes-Hughes *et al.* 2010). There seems to be lack of published information that sheds light

on the extent of food insecurity among South African university students. It is thus, essential to conduct studies to investigate the prevalence of food insecurity among local university students, address these issues and investigate the coping strategies employed by undergraduate students in order to deal with financial stress and food insecurity. To gain insight into the impact of food insecurity on the student community, appropriate recommendations are required for the development of future strategies to address food insecurity among UKZN students by taking cognisance of how students cope with financial stress. This in turn, will contribute to finding solutions to improve their academic performance.

1.2 Study aim

The aim of this study was to investigate food insecurity and related coping strategies among undergraduate students enrolled at the University of KwaZulu-Natal, Pietermaritzburg campus.

1.3 Study design

The study design was a cross sectional descriptive study, which is normally completed over a short period of time without any follow up assessments (Merrill 2012, p92). Cross sectional studies are effective in determining the prevalence of knowledge and attitudes towards a particular event or concept (Merrill 2012, p93). The latter rendered this study design appropriate for the current study.

1.4 Research objectives and hypotheses

1.4.1 Research objectives

The following study objectives were set in order to achieve the study aim:

- To determine and compare the prevalence of food insecurity among undergraduate students receiving financial aid versus those not receiving financial aid;
- To determine and compare the nutritional status of undergraduate students receiving financial aid versus those not receiving financial aid by means of body mass index (BMI);

- To compare and evaluate the dietary diversity of undergraduate students receiving financial aid versus those not receiving financial aid by means of a non-quantified food frequency questionnaire;
- To investigate the factors that influence food insecurity among undergraduate students receiving financial aid versus those not receiving financial aid;
- To determine and compare coping strategies adopted when faced with financial stress and food insecurity among undergraduate students receiving financial aid versus those not receiving financial aid; and
- To develop recommendations to alleviate financial stress and food insecurity based on the previous objectives.

1.4.2 Hypotheses

The following hypotheses were outlines for the purpose of the study:

- There will be no significant difference in the prevalence of food insecurity among undergraduate students receiving financial aid and those not receiving financial aid;
- There will be no significant difference in the BMI among undergraduate students receiving financial aid and those not receiving financial aid;
- There will be no significant difference in the dietary diversity among undergraduate students receiving financial aid and those not receiving financial aid;
- There will be significant difference in the factors that influence food insecurity among undergraduate students receiving financial aid and those not receiving financial aid; and
- There will be no significant difference in the coping strategies adopted by undergraduate students receiving financial aid and those not receiving financial aid.

1.5 Study parameters

1.5.1 Inclusion criteria

For the purpose of this study, the following inclusion criteria were set:

- Male and female participants of all race groups;
- Registered undergraduate students who are studying at UKZN at Pietermaritzburg campus; and

- Participants who are on financial aid and those who are not on financial aid.

1.5.2 Exclusion criteria

For the purpose of this study, the following exclusion criteria were set:

- Subjects who are not studying at UKZN, Pietermaritzburg campus; and
- Post-graduate students.

1.6 Assumptions

It was assumed that participants completed the survey questionnaire truthfully and the data collection is a true representation of the study sample.

1.7 Definition of terms

The following concepts are defined for the purpose of the study:

Body mass index	A measure of body fat that is the ratio of weight in kg divided by height in metres squared. ($BMI = \text{weight (kg)} / \text{height (m}^2\text{)}$) (Merriam Webster 2014)
Content validity	Content validity requires the use of recognized subject matter experts to evaluate whether test items assessed defined content and more rigorous statistical tests than does the assessment of face validity (William 2006).
Face validity	Face validity assesses whether the test "looks valid" to the examinees who take it, the administrative personnel who decide on its use, and other technically untrained observers (William 2006)
Financial aid	A loan and bursary scheme funded by the Department of Higher Education and Training for those who do not have the means to fund their studies and cannot access bank funding, study loans or bursaries (Department of Higher Education and Training 2011).
Food access	Access to sufficient resources for obtaining food for a healthy and wholesome diet [Food and Agricultural Organisation (FAO) 2006].

Food availability	The dispersal of adequate quantities of food of appropriate quality, provided by domestic production or imports (including food aid) (FAO 2006).
Food security	A state “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active lifestyle” (FAO 2002).
NSFAS Funding	A student loan whereby money is borrowed from NSFAS to cover the costs of studies at any of the 25 public universities in South Africa. This includes: tuition fees, residence or private accommodation, food, books and travel costs. The loan must be repaid to NSFAS when studies are completed and employment found (Anon 2015a).
Nutritional status	The energy/weight status of an individual in relation to adiposity which is determined by BMI (WHO 2004).
Social grant	Social grants are administered by the South African Social Security Agency (SASSA). SASSA is mandated by the South African Social Security Agency Act of 2004 to “ensure the provision of comprehensive social security services against vulnerability and poverty within the constitutional legislative framework” (Kelly & Groundup Staff 2014).

1.8 Abbreviations

CSI	Coping Strategy Index
DOH	Department of Health
DUT	Durban University of Technology
FAO	Food and Agriculture Organisation
FFQ	Food Frequency Questionnaire
FSP	Food Security Program
GHS	General Household Survey
HFIAS	Household Food Insecurity Access Scale
HFII	Household Food Insecurity Index
HSCR	Human Science Research Council

IFIAS	Individual Food Insecurity Scale
ISAK	International Standards for Anthropometric Assessment
NSFAS	National Student Financial Aid Scheme
PMB	Pietermaritzburg
SA	South Africa
SANHANES	South African National Health and Nutritional Examination Survey
SASSA	South African Social Security Agency
SPSS	Statistical Package for Social Science
UKZN	University of Kwazulu-Natal
UNDP	United Nations Development Program
US FSSM	United States Food Security Survey Module
WHO	World Health Organisation

1.9 Summary

South Africa has been investing in education in order to alleviate poverty. The country may be food secure; however, a large proportion of its population is at a high risk of being food insecure. Students enrolling at universities have been identified to be at risk of becoming food insecure as the majority hail from a low socio-economic background. Food insecurity hinders the physical, emotional and cognitive development and wellbeing of these students. This phenomenon results in poor academic performance and low throughput rates. As a result, food insecurity inhibits the primary purpose of education which is to improve the employability and socio-economic status of people. Therefore it is important to investigate the coping strategies adopted by students who experience food insecurity in order to find solutions to alleviate this problem.

1.10 Dissertation overview

This dissertation consists of six chapters which covers all the stages of the research process. In the current chapter (Chapter 1), the research objectives were outlined as well as the background and the importance of the study. Chapter 2 focuses on the relevant literature

related to food insecurity and the related factors that have an impact on undergraduate students. It also provides insight into the coping strategies adopted by individuals when faced with financial stress and food insecurity. Chapter 3 describes the methods and materials used in the study. Hence, it includes the study design, research questionnaire as well as the reliability and validity of the tools used. Chapter 4 presents the study results while Chapter 5 discusses these results in relation to the relevant literature presented in Chapter 2. In Chapter 6, the study conclusions and recommendations are presented as a communication of the study findings.

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

In South Africa, people living on the higher level of the poverty line dropped from 57.2% in 2006 to 45.5% in 2011 translating into a decrease from 27.1 million people in 2006 to 23 million people in 2011 (Statistics South Africa 2014). As far as the percentage of people living in absolute poverty is concerned, the number decreased from 26.6% in 2006 to 20.2% in 2011. This can be interpreted as a decrease from 12.6 million people in 2006 to 10.2 million people in 2011 (Statistics South Africa 2014). However, national poverty rates still remain extensive. A significant contrast in poverty within the South African population can be noted, with 94% of poor individuals in the country being black Africans in 2011. This figure increased from 2006 (92.9%) to 2009 (93.2%) (Statistics South Africa 2014). In 2011, the national poverty level among the country's race groups were black Africans at the highest percentage of 54.0% followed by 27.6% among coloureds, 3.4% among Indians/Asians and 0.8% among whites (Statistics South Africa 2014). By mid-2013, 1 in 5 people in a population of approximately 52, 98 million were food insecure (Statistics South Africa 2014).

According to the South African constitution (Republic of South Africa 1996) in Section 27(1), access to food is regarded as a basic human right in South Africa. Therefore it is the duty and obligation of the government to make sure that all South African citizens are food secure. Food insecurity is an outcome of a situation whereby individuals have restricted or no resources to enable them to be food secure (Bickel, Nord, Price, Hamilton & Cook 2000). Food insecurity can be defined as having inadequate food and/or a lack of experience to hunger due to poor food storage and an inability to have enough money to purchase sufficient food. It also entails the consumption of a nutrient deficient diet due to limited food choices and stress about acquiring food or having to depend on food aid (Bickel *et al.* 2000).

Globally dealing with food security is a major challenge, especially in developing countries (Koch 2011; FAO 2006; De Klerk *et al.* 2004). According to the FAO (2006), globally 39 countries were faced with a severe food crisis and required external help for managing perilous food insecurity, among which 25 countries were from Africa. South Africa also has a high unemployment rate, soaring food and fuel prices, energy rate and interest rates which places poor households at a higher risk of food insecurity (Labadarios, Davids, Mchiza &

Weir-Smith 2009). In an ideal world, poverty and food insecurity could be resolved by increasing employment prospects, enhancing household capital, which consecutively will improve buying power (De Klerk *et al.* 2004). Unemployment in South Africa has increased from 100 000 to 4, 6 million between the fourth quarter of 2012 and the first quarter of 2013, resulting in a 25.2% increase in the level of unemployment (Statistics South Africa 2014). As there is a greater likelihood of employment with a higher level of education, a well-educated household is less likely to suffer from food insecurity.

2.2 Food security among university students

South African universities were faced with a considerable increase in students' admissions in the last decade. In 2011, nationwide intake was reaching 538 210. It was anticipated that this would increase by 2% in 2012 (Cloete & Moja 2005). At the University of KwaZulu-Natal, it is a basic requirement that a minimum of 15% of students enrolments are drawn from poor socio-economic backgrounds, i.e. students who have completed their schooling at Quintile 1 or 2 schools (Anon 2013). Thus, numerous students who are registered for tertiary education come from financially disadvantaged backgrounds (Letseka & Maile 2008) and are thus susceptible to being food insecure. This explains why a large number of students enrolled at South African universities have been found to suffer from significant financial stress, food insecurity, hunger, a lack of dietary diversity and low intake of micronutrients (Petersen, Louw & Dumont 2009). A study conducted among students at the University of Alberta in Canada, evaluated the adequacy of funding and the risk of food insecurity. It was found those students who are given financial support, had a tendency to have inadequate finances for the consumption of a nutritious and wholesome diet, and hence were highly susceptible to being food insecure (Meldrum & Willows 2006).

Poverty, food insecurity and hunger among students mark the elevated dropout rate and low graduation rate, particularly at South African universities (Hughes *et al.* 2011; Letseka & Maile 2008). Letseka & Maile (2008) stated that the key reason for student drop-out was found to be financial and not academic difficulties, as only two out of 23 local universities namely; Stellenbosh University and the University of Witwatersrand described academic reasons as the main reason for student drop-out. According to Munro, Quayle, Simpson & Barnsley (2013), a student's weekly food expense at UKZN was approximately R127.93 and the students were reported to be hungry near exam time. From the student population

surveyed by Munro *et al.* (2013), more than 38% were food insecure with 11% being highly vulnerable to food insecurity. In addition, students on financial aid were more susceptible to food insecurity than others. The result of the survey conducted by Munro *et al.* (2013) was also backed up by those of Hughes *et al.* (2011) who also stated that students who were receiving financial aid were significantly more vulnerable to food insecurity.

Based on the study conducted on 269 students from UKZN on financial aid by Kassier & Veldman (2013), it was reported that the frequency of food insecurity among student was high and that 53.1% were moderately food insecure with a mean monthly food expenditure being R487.90. This can be recalculated to R16.26 per student per day. The majority of students, who participated in the survey, also stated that their hunger levels were the highest at the end of the semester, which coincides with the examination period (Kassier & Veldman 2013). Research conducted by Van den Berg & Raubenheimer (2015) among 1416 students at the University of Free State, reported that 65% of the study sample was food insecure of which, 60% of the respondents were facing food insecurity with hunger while 25% were suffering from food insecurity without hunger. Moreover, it was found that being food insecure was more prevalent among black and coloured male undergraduate students, including participants who were not married, do not have a part time job and are on financial aid.

2.3 Factors affecting food security of university students

2.3.1 Provision of financial aid to students' food security

In the last ten years, government expenditure on education and financial aid for higher education has increased substantially (Letseka & Maile 2008). This increase in university registrations have caused a decrease in the amount of funding per student over the last ten years. It would be expected that students receiving financial aid are safeguarded from food insecurity since being financially secure is critical in addressing food insecurity (Petersen *et al.* 2009), yet this has not been the case. Promoting accessibility of tertiary education to students from disadvantaged backgrounds brought about new levels of socio-economic disproportions within the student community (Petersen *et al.* 2009; Letseka & Maile 2008), as the majority of these students do not have adequate funds to pay for their studies or their day-to-day expenses.

The University of KwaZulu-Natal provides limited financial aid to students whose combined annual family income is less than R150 000, in the form of a loan which needs to be paid back with interest after leaving the university and/or graduating. A portion of the loan (40%) can possibly be converted into a bursary should the student pass all the modules forming part of a degree. In addition, after the first academic year, bursaries may be offered to students who passed all their registered modules with 65% and above and whose gross family income is less than R150 000 per annum. The loan provided to disadvantaged students by the institution only funds tuition fees and does not include accommodation, food and textbooks. Scholarships that cover tuition fees only is granted to a maximum of 12 students, who have been participating in sports at a national level before registering with the institution. Renewals of bursaries would be based on satisfactory academic standing (Anon 2013).

It is the government's obligation to proactively get involved in interventions aimed at reinforcing the availability of food and the use of resources to allow people to feed themselves (Department of Agriculture, Forestry and Fisheries 2014). Students who are granted government financial aid are categorised as at risk, since financial support is only offered to those whose socio-economic status is usually 20 to 39% below the poverty margin (Hughes *et al.* 2011). Therefore, the South African government provides financial assistance to the majority of financially deprived students through NSFAS (Letseka & Maile 2008). Financial aid is given to students with the objective of assisting them to complete their undergraduate studies which will eventually increase their job prospects and consequently result in food security and financial independence (Innes-Hughes *et al.* 2010). The limited allowance provided for students, determine what the students on financial aid are able to buy and how to distribute their disposable funding (Hughes *et al.* 2011). The Department of Higher Education & Training (2011) reports that with no exclusion, every Vice chancellor and Deputy Vice chancellor as well as the vast majority of student leaders from South African Universities who have been interviewed, specified that the amount of NSFAS financial support provided for accommodation and food was not sufficient. Students on financial aid at UKZN were receiving an annual amount of R5 026 for meals which were paid out as eight monthly payments of R628.24. This equates to each student receiving R20.85 per day for food and hence under R7 per meal (Anon 2011).

2.3.2 Impact of family background on food security status

South Africa has the capacity to produce food for its entire nation, however, many individuals and households still suffer from extreme food insecurity (Altman *et al.* 2009). In the year 2000, 14.3 million South Africans were found to be struggling with food insecurity, with rural residents being at a greater risk and being additionally needy as a result of their insufficient buying power (Koch 2011). The South African government has pledged to reduce poverty by half between 2004 and 2014. Hence, household food security is a critical aspect to meeting this goal, including access to food and water as they are vital for human survival and development (Altman *et al.* 2009).

Socio-economic factors and food security status form an integral part of students' lives and they are difficult to ignore once registered at an institution of higher education. Students that hail from previously disadvantaged backgrounds would continuously be faced with problems from the "baggage" they carry, especially through their first year at university (Brits, Hendrich, Walt & Naidu 2011). In addition, attending university is proving to be extremely costly for students across the world (Chaparro, Zaghloul, Holck & Dobbs 2009). If students from developed countries and some with secured funding face problems in obtaining food, it infers that students from poor socio-economic backgrounds would face even bigger challenges in order to sustain themselves. The elevated tuition costs results in direct consequences on food insecurity, leading to financial stress on students. Particularly those from disadvantaged socio-economic backgrounds.

High income households are likely to spend their food budget on healthier and high quality foods compared to lower income households who opt for cheaper options, refined grains, added sugars and foods packed with vegetable fats (Tarasuk 2009). The financial status from which the students originate, has an influence in their food security status (Chaparro *et al.* 2009). Households facing poverty spend substantially larger amounts (70%) of their budgets on food, fuel and electricity, unlike those of a higher socio-economic status who spend a larger proportion of their budgets on transport and medical care (Bhorat & Oosthuizen 2005). Thus, poor households are relatively more vulnerable to food price fluctuations as it is their major expense (Labadarios, Swart, Maunder, Kruger, Gericke, Kuzwayo, Ntsie, Steyn, Schloss, Dhansay, Jooste & Dannhauser 2008; Bhorat & Oosthuizen 2005). The cost of food purchases is extensive for people with restricted finances and it greatly determines what they

can purchase and how to allocate their budget around it (Hughes *et al.* 2011; Bhorat & Oosthuizen 2005).

Even students who do have some financial assistance encounter financial difficulties to cope with living costs that include food (Letseka & Naidoo 2008). In addition to outstanding tuition fees, accommodation costs, textbooks, stationery, transport and other expenses add to financial stresses resulting in food insecurity. In South Africa, 70% of the families of surveyed students who dropped out from higher education studies were classified as being of a low socio-economic status. Moreover, black families were predominantly found to be poor, with some parents or guardians earning less than R1 600 per month (Letseka & Maile 2008). According to the study conducted among 429 households in an informal settlement in the Vaal Region by Oldewage-Theron & Slabert (2010), it was found that 286 households lived in poverty, had an unemployment rate of 91% and received a mean monthly income of R 612.50. According to the SANHANES-1 survey, out of the 5 972 households surveyed, 39% indicated not having sufficient money to purchase food and clothes (Shisana *et al.* 2013). The majority of these households were situated in informal urban and rural settlements.

Due to the fact that the majority of students come from a low income background, a considerable fraction of students face food insecurity as a result of transferring their funds home to help their families (Tomaselli 2010). Ideally, money that is sent home could have been utilized to buy food and making sure that there is a sustainable food supply for the student. According to the study conducted at the University of Free State of the 1416 students, 21.6% reported that they support a person financially (Van den Berg & Raubenheimer 2015). The latter consisted of parents/siblings/children. Despite 16% of the students reported to holding a part-time job, they indicated that their employment interfered with their studies. It was also found that students who hail from previously disadvantaged backgrounds are conscious about their financial crisis and acknowledge that their families have little or no means to assist them in their endeavor in achieving tertiary education (Shreeves 2010).

2.3.3 Government Grants

It is evident that since 2001, social grants given to the South African population by the government have played a major role in enhancing household food security (Altman *et al.*

2009). Since 2000, the social assistance system of South Africa has increased from approximately 15 million grants to 23 million grants by 2011, with child support grant expanding from 150 000 beneficiaries in 2000 to over 10 million in 2011 (Statistics South Africa 2014). From the entire South African population the percentage of individuals who benefitted from government grants escalated from 12.7% in 2003 to 30.2% in 2013. At the same time, the proportion of households that obtained a minimum of one grant rose from 29.9% to 45.5%. The largest number of grants allocated was in Eastern Cape (40.3%), Limpopo (38.7%) and Kwazulu-Natal (37.2%) (Statistics South Africa 2014). It is important to increase job opportunities as there will be constant dependence on grants, given the high poverty and unemployment rate of the population (Altman *et al.* 2009). In 2014, a total of 15 821 946 grants were allocated in South Africa among which 3 735 899 were in KwaZulu-Natal (SASSA 2014). Kwazulu-Natal has the highest amount of people receiving grants compared to any other province with the maximum amount of child support grant (2 642 302), foster child care grant (123 576), child disability grant (35 270), grant in aid (30 109), disability grant (296 036) and old age grant (608 548) (SASSA 2014).

2.3.4 Financial mismanagement by university students

University students have difficulty to efficiently spend their available funds. The sources of funding comprise of financial assistance revenues, salaries from part-time employment or allowances from families in order to cater for a broader range of expenditures (Shreeves 2010). Students who belong to financially stable households and have fully sponsored bursaries and scholarships, can manage the combined expense of higher education. If at all possible, students in these situations should not be faced with food insecurity as they are given revenue in the form of meal allowances, being in a better position to consume nutritious and wholesome food. Coming from a low socio-economic background has proven to affect student's food security status negatively due to compromised dietary intake, which is more prevalent among students who do not receive any financial assistance or funding schemes (Bozik 2007). Students, who are financially secure, can achieve food insecurity in accordance with the way they manage their finances (Hughes 2009). Some students do not possess the skills to manage their finances in terms of budgeting and grocery purchases. This leads to expenses on other commodities which are not as important as buying healthy and wholesome food (Tomaselli 2010). Hence, resulting in food insecurity.

From a study conducted by the African Centre for Food Security, Tomaselli (2010) described that students unnecessarily spend their funds on clothes, alcohol and other forms of leisure activities rather than investing in the purchase of healthy food items. Letseka (2007) reported similar results, where it was stated that a great portion of students, mostly those in their first year, over spent money on designer clothes, reckless consumption of alcohol and partying excessively. In cases where students live independently in university accommodation and other private residences, they have more freedom regarding the money they spend at their will and thus are inclined to spend more on luxuries (Hayhoe, Leach, Turner, Bruin & Lawrence 2000). Students such as these, need to be careful when it comes to financial expenditure and therefore need to be informed about the basics regarding financial management (Meldrum & Willows 2006). The study by Meldrum & Willows (2006) investigated food insecurity among students who were granted financial assistance. The authors concluded that shopping and budgeting expertise are essential skills that can help to alleviate students' food insecurity (Meldrum & Willows 2006).

A lack of financial planning is a crucial problem which is undervalued among university students (Meldrum & Willows 2006). Instead of spending their funds smartly or saving available funds, students give in to the temptation of spending it on optional items having been lured by marketing strategies targeted at university students (Hayhoe *et al.* 2000). Staying far from home and the prospect of part-time employment between lectures may stimulate overspending and increase debt. According to Ntuli (2005), a lack of income negatively affected the students' ability to sustain a reasonable eating pattern at the Durban University of Technology (DUT), because insufficient income restricts the amount, quality and diversity of food consumed. It was also stated that student did not possess consumer skills such as budgeting, in order to make maximum use of available resources and healthy food choices (Ntuli 2005). The mismanagement of money among students makes it evident that it is essential to educate them on the importance of health and nutrition, food preparation and the importance of budgeting and managing finances as well as the provision of purchasing skills.

2.3.5 Students' accommodation and its relationship to food insecurity

South African universities accept and receive students from different cities and provinces, including other countries (Higher Education in Context 2011). To provide accommodation

for students who come from far, housing is made accessible for students (Anon 2013). However, the majority of universities have difficulty in accommodating undergraduate students due to limited resources such as funds and lodging facilities (Weligamage 2007). The University of KwaZulu-Natal provides on-campus and off-campus accommodation facilities. Despite the latter, student residences are limited and rooms are allocated based on the student's needs, academic skill, and capacity to make payment and how much further from home they hail (Anon 2013). The Pietermaritzburg campus of the University of KwaZulu-Natal provide accommodation for around 1 640 students of which, one third of the applicants for student residence stay in one of the four buildings. Females and males are given separate accommodations and none of the residences provide dining or self-catering facilities (Anon 2013). Hence, students have to bring their own cooking appliances should they wish to cook their own food. Unfortunately, it is impossible to assign rooms to all registered applicants and therefore many students have to find their own accommodation during term. Due to a lack of resources, most students from low socio-economic backgrounds are forced to find alternative (or private) accommodation, should they be staying far from home. However, the safety and suitability of alternative accommodation is questionable.

Student who live far from home and rent or share private accommodations are more susceptible to being food insecure (Hart 2009) as the majority have to pay rent on a monthly basis which puts strain on their financial resources. Financial security become an important aspect which cannot be ignored. The communal kitchens that are available for students at university residences or communal houses are known to increase the risk of food theft (Hart 2009 & Tomaselli 2010). This has a direct impact on students' food security status. It was reported by Hughes *et al.* (2010) that food insecurity is more prevalent among students who were boarding, renting or sharing housing with a minimal allowance from home and financial schemes offered by the government. A study conducted in Australia revealed that 40% of the students who lived with their parents were less prone to being food insecure. Students realise that food theft cannot be prevented in communal areas, hence even placing a label on their food items in the common refrigerator, is not necessarily going to serve as a deterrent to prevent theft (Ngidi 2010). This demonstrates that the type of accommodation that the student reside in and the availability of food storing facilities does have an impact on the food security status of students.

2.3.6 Environmental exposure

The environment surrounding students, influences the types of food eaten, this in turn has an effect on food utilization (Rondeau 2007; Burns & Inglis 2006). Burns & Inglis (2006) reported that the type of food that is consumed is not only influenced by the environment and student perceptions; but that cultural background also has an effect on food choices. For instance, if students are used to certain foods, they cannot easily access those particular foods when they move away from home to stay by themselves. In addition, it can be difficult for them to adjust and find other food sources that they have never been exposed to before. This can result in inadequate food intake. Most students are not conscious of the environment they live in and how it takes a toll on their food security. Thus, they easily surrender to the ‘ways of living’ as a result of environmental conditions around them and indulge in unhealthy and affordable eating habits. If one is not aware of the importance of sound nutrition, the risk of consuming food of poor quality in the pursuit of satisfying needs increases. The latter can result in raising diet-related diseases and fatigue (Booth & Smith 2001).

The University of KwaZulu-Natal, Pietermaritzburg campus, is situated in close proximity of supermarkets, food outlets and cafeterias making food readily available. In cases where students reside closer to fast food outlets, they are more likely to purchase unhealthy foods, even though there is a supermarket close by where one can make a better selection of healthier foods (Raphael 2009). Food choice, nonetheless, is determined by shelf life, suitability, preparation time, packaging and affordability (Ayalew 1997). Despite food availability, food consumption is eventually influenced by whether one can afford to pay for the food item or not.

In general, a university should be providing a healthy and enjoyable educational experience for a student. However, advertising alcohol and the shortage of leisure activities in rural surroundings have encouraged new tendencies of alcohol consumption among students (Dlamini, Rugbeer, Naidoo, Metso & Moodley 2012). The majority of students who attend rural tertiary institutions are forced to live close to the institution and progressively revert to alcohol abuse directly or indirectly (Dlamini *et al.* 2012). Alcohol indulgence has encouraged students to forget their primary aim of studying in higher education. Students who consume alcohol excessively do not routinely attend classes, or lose focus in class, resulting in poor academic performance (Dlamini *et al.* 2012). In South Africa, the frequent age for binge

drinking is between eighteen and thirty five years (Addiction Search 2011). The dominance of peer pressure can become overpowering, particularly to students who have been exposed to this form of humiliation while at school. Adolescents can feel doubtful and may have no self-esteem making them defenseless to peer-pressure and the irresistible craving to fit in and do "what everyone else is doing," although it implies participation in high-risk activities such as drinking, smoking and having casual sex (Dlamini *et al.* 2012). Students become more independent in their decision making at this stage of their lives and consequently, pursue personal relationships that add value to their perceptions and make sure their feelings are understood. Alcohol is used to demonstrate their emerging adulthood and improve acceptance among peers while some consume alcohol to deal with stress (Dlamini *et al.* 2012).

2.4 Methods of measuring food security among young adults

The most well-known and frequent approaches to assessing food security include the use of the Household Food Access Scale (HFIAS), Food Insecurity Index, Coping Strategies Index, the US FSSM, Hunger Scales and numerous nutrition indicators (Bickel *et al.* 2000). Food security can be assessed using various tools, including the quantity of food consumed, dietary diversity, dietary quality, coping strategies employed and the Coping Strategies Index (Msaki 2010).

The Coping Strategy Index (CSI) evaluates behaviour of an individual namely how people go about coping when they cannot access enough food. It is faster, simpler, and cost effective to collect data on coping strategies than on actual household food consumption levels. Hence, the CSI is a suitable instrument for situations when other methods are not practical or timely. During food aid needs assessments the instrument helps to identify areas and population groups where needs are the greatest. It can also shed light on the reasons for high malnutrition rates, which are usually very hard to identify (Maxwell & Caldwell 2008).

A study conducted in a community by Msaki (2010) within Pietermaritzburg, KwaZulu-Natal among 200 individuals from 176 households, was designed to develop and test tools to assess household food security. The result from the study found that the Household Food Insecurity Index (HFII) enlightened the impact of demographic and socio-economic factors on households' food insecurity while the HFIAS was found to be the most appropriate to apply as far as it is an easy data management and computation process. Moreover, the HFIAS proved

to be a good instrument in distinguishing between food secure and food insecure households and it had a significant statistical relationship with the Coping Strategies Index Scores. A study conducted in Toronto, Canada among free living adults above the age of 18 years, compared the HFIAS, US FSSM and an adapted US FSSM tools to investigate food insecurity. Findings were that the HFIAS was a more suitable tool as it was easily understood by the subjects surveyed (Holland, Kennedy & Hwang 2011).

2.5 Assessment of nutritional status

Fluctuations in body measurements and proportions indicate the general health and wellbeing of individuals and populations (Cogill 2003). Anthropometry is an extensively employed, advantageous, cheap, quick, non-invasive tool that requires limited training to estimate the nutritional status of individuals and populations. These measurements allow for identification of individuals who need nutritional assistance and to investigate the impact of an intervention (Cogill 2003). Calibrated, portable equipment can be used, which are reliable and makes it perfect for field surveys, epidemiological research and piloting nutritional observations. These measurements provide data about the nutritional history of the individuals or population, which cannot be accurately assessed with other assessment instruments (Cogill 2003). The four indices required to carry out anthropometric assessment include age, sex, height and weight. Each of these building blocks provides a portion of data about a person which can be used to assimilate key information about the individual's nutritional status. This basic information is frequently merged and represented as one variable for a clearer understanding, for instance BMI (Cogill 2003).

BMI has been reported to be fairly impartial to height, and shows a good link with laboratory based measurements of obesity among all adult and adolescent populations (Cogill 2003). The BMI is suitable for assessing the impacts of temporary alterations in the diet such as seasonal variations in food supply or short-term nutritional stress induced by illness and is a decent indication of energy intake (WHO 2004; Cogill 2003). It has been described to be more accurate compared to skinfold thickness measurements and is easy to employ in large scale nutrition surveys and epidemiological studies. Hence, it is globally used to categorize weight status among adults of all ages (Gibson 2005, p259).

The WHO (2004) BMI classifications and associated risk for co-morbidities are presented in Table 2.1. It is important to take cognisance of the fact that BMI cannot differentiate between weight associated with fat (adiposity), oedema or muscle and gives no indication of body fat distribution (Gibson 2005, p268).

Table 2.1: The WHO BMI classifications and associated risk for co-morbidities

Classification BMI(kg/m ²)		
	Principal cut-off points	Risk of co-morbidities
Underweight	<18.50	Low (but risk of other clinical problems increases)
<i>Severe thinness</i>	<16.00	
<i>Moderate thinness</i>	16.00 - 16.99	
<i>Mild thinness</i>	17.00 - 18.49	
Normal range	18.50 - 24.99	Average
Overweight	≥25.00	
Pre-obese	25.00 - 29.99	Increased
Obese	≥30.00	
<i>Obese class I</i>	30.00 - 34.99	<i>Moderate</i>
<i>Obese class II</i>	35.00 - 39.99	<i>Severe</i>
<i>Obese class III</i>	≥40.00	<i>Very severe</i>

Source: WHO 2004

2.5.1 BMI status of university students

Globally, the prevalence of obesity has doubled since 1980 and in 2014, WHO (2015) reported that more than 1.9 billion (39%) adults 18 years and older were overweight and of these, 600 million (13%) were obese. The majority of the global population resides in countries where death is more likely to be linked to overweight and obesity than to underweight (WHO 2005).

A study conducted by Puoane, Steyn, Bradshaw, Laubscher, Fourie, Lambert & Mbananga (2002) recruited 13 089 males and female respondents older than 15 years of age at random. This study assessed the anthropometric status of South Africans as a follow up to the South

African Demographic and Health Survey conducted in 1998. Males and females had a mean BMI of 22.9 kg/m² and 27.1 kg/m², respectively. The prevalence of overweight and obesity was 29.2% among males and 56.6% among females. Being underweight was reported to be more prevalent among of the males (12.2%) than females (5.6%). The study concluded that obesity increased with age and that obesity was more common among urban black women and over nutrition was more common among adult South Africans, especially women. However, these figures are much higher than those reported in the 1998 SADHS that stated that 31.8% of black women older than 15 years were obese and that an additional 26.7% were overweight. The incidence of obesity among men of the same age was 6.0%, with 19.4% being overweight. These results infer that the prevalence of obesity among South African adults is increasing.

Among 25 532 individuals surveyed in South Africa by the SANHANES-1, it was reported that the mean weight of males and females of participants aged 15 to 24 years are 59.6 kg and 63.0 kg respectively (Shisana *et al.* 2013). South African males had a lower mean BMI of 23.6 kg/m² when compared to the mean BMI of females (28.9 kg/m²). Moreover, males (168.5 cm) were found to be significantly taller than females (157.8cm) (Shisana *et al.* 2013). The prevalence of overweight and obesity was significantly higher in females than males (24.8% and 39.2% compared to 20.1% and 10.6% for females and males, respectively). On the contrary, the prevalence of underweight was significantly higher in males (12.8%) than females (4.2%) (Shisana *et al.* 2013).

In Khayelitsha, Cape Town, a study by Malhotra, Hoyo, Østbye, Hughes, Schwartz, Tsolekile, Zulu & Puoane (2008), investigated the possible causes of obesity among the black population of 637 aged 18 and older. The prevalence of overweight/obesity was 53.4% among women and 18.7% among men.

Black women were reported to have the uppermost incidence of obesity among a locally economically active adult population of 2100 aged 18 to 65 years (Senekal, Steyn & Nel 2003). The statistics for overweight/obesity in the various ethnic clusters were: black women (75%); black men (49%); coloured women (66%); coloured men (45.7%); Indian women (37%); Indian men (36%); white women (42%); and white men (56%).

Cilliers, Senekal & Kunene (2005) conducted a cross-sectional study among 360 female first year students at the University of Stellenbosch to determine the link between weight status of first year female students and numerous weight management-related factors to determine possible aspects of a weight management programme for students. The mean BMI of the sample reported was 21.8 kg/m², at 7.2% being underweight, 81.9% being of a normal-weight, 10.0% overweight and 0.8% obese. Ntuli (2005) stated that there was a considerable gender differences for BMI for students studying at DUT from which 17% of the female students were overweight and 13% were obese while 10% of the males were found to be overweight and 7% were obese. Hence, females were found to be more overweight and obese than males.

2.5.2 Relationship between food security and BMI status

Countless low and middle-income countries are suffering from a “double burden” of disease which implies that issues of infectious disease and under nutrition persist while there seem to be a rapid increase in non-communicable disease such as obesity and overweight especially in urban areas (WHO 2015). In addition, it is not unusual to find the prevalence of both obesity and underweight prevailing in the same country, same community and same household. In low and middle-income countries, children are more susceptible to poor pre-natal, infant and young child nutrition which explains why they are under nourished (WHO 2015). However, they are also exposed to a high fat, high carbohydrate, high salt and energy dense diet with poor micronutrient levels which are more affordable and less nutritious when combined with a lack of physical activity. These variables result in a rapid increase of childhood obesity while under nutrition is still remains unsolved (WHO 2015).

It was reported by Gooding, Walls & Richmond (2011) that obesity was more prevalent among food insecure young adult females than males. However, no link was found between food security status and BMI among young adult males. On the other hand, Wilde & Peterman (2006) found that food insecure men and women were obese and gained more weight over a year when compared to men and women from food secure backgrounds. Food insecurity and obesity was found to be related in children that as food insecurity status decreased, obesity increased (Buscemi, Beech & Relyea 2011). Hence, it is evident that the relationship between overweight, obesity and food insecurity is significant.

2.5.3 Dietary diversity of university students

2.5.3.1 Methods used to assess dietary diversity

Dietary diversity is estimated by evaluating foods that individuals consume. There are various methods to assess dietary diversity, measuring not only which foods are consumed, but the ways of preparation, amounts consumed and beverage consumption, including alcohol and caffeine containing beverages. Numerous tools used for calculating food consumption include 24-hour recalls, a food diary or food intake record, weighed food records, dietary history and food frequency questionnaires. The food frequency questionnaire (FFQ) aims at measuring the regular intake of foods or specific groups of foods (Gibson 2005, p41). Through adjustments and new computerised technologies, this method has allowed the reflection of usual intakes. The FFQ is less challenging and less time consuming compared to other methods for both the researcher and participants and is frequently used in epidemiological studies (Ambrosini, de Klerk, O'Sullivan, Beilin & Oddy 2009). The latter authors investigated the reliability of the utility of a semi-quantitative food frequency questionnaire among adolescents and found that the questionnaire was able to suitably rank a reasonable fraction of adolescents as far as dietary diversity was concerned.

2.5.3.2 Nutritional status of university students

Young adulthood is a period which occurs between the age of 17 and 30 years. Nutritional requirements, growth and development is incomplete at that stage (Grosvenor & Smolin 2006, p466). There is a change in the body's composition and nutritional needs of both genders at this stage of the life span. Sexual maturity as well as physical growth is enhanced, thus increasing the protein and energy requirements of the individuals (Grosvenor & Smolin 2006, p458). Likewise, micronutrients are also necessary and their need in the body increases to facilitate this transition in young adults.

Oldewage-Theron, Dicks, Napier & Rutengwe (2005) reported that iron deficiency was extensive among females between the ages of 13 to 25 years. This was due to the consumption of a South African diet based on plants which has a low iron bioavailability. Registered students at the University of Free State who had their intake of nutrients evaluated, reported that more than half of the student population had an inadequate micronutrient consumption, particularly for calcium and vitamin A (Badenhorst, Dannhauser, Slabber, du

Toit & Nel 1998). The study sample also demonstrated an inadequate consumption of protein and numerous other micronutrients namely folate, iron, magnesium, niacin, riboflavin, thiamin, cobalamin, pyridoxine, vitamin C and zinc. It was concluded that the diet of the study sample surveyed, represented a typical westernized, urban diet which was energy dense with a lack of micronutrients.

South Africa, similar to other developing countries has been experiencing a shift from traditional high fibre, low fat diets, to characteristic Western diets which have an elevated concentration of fat, sodium and added sugars and are low in unrefined carbohydrate, dairy, fruits and vegetables, including the shift from more active lifestyles, to more sedentary activities (Bourne, Lambert, Steyn 2002). These trends have been associated with the high prevalence of obesity amongst black South Africans, particularly women living in urban areas.

In the report from the Department of Higher Education and Training (2011) which reported on student housing at institutions of higher education in South Africa, students were consuming less nutritious and low quality foods. It was noted that students were suffering from hunger for days on end and that starvation was extremely predominant among all South African universities students. Pap (stiff porridge) and milk were the most frequently consumed meal in most of the self-catering university houses. Therefore, it is not unexpected that Ntuli (2005) found that the consumption of foods such as vegetable, fruit, meat and milk products was low among students from DUT. Consequently, the ingestion of nutrients such as iodine, calcium, vitamin A, zinc, vitamin C, riboflavin, pyridoxine, iron and magnesium was found to be insufficient. Ntuli (2005) added that results from the FFQ that was administered indicated that the eating pattern of students were westernized as most of them admitted to eating foods from the cereal, meat, sweets and oil groups, with a low intake of foods belonging to the fruit and vegetable group. The consumption of vitamin C among 77% of the students was low because of poor fruit intake. It was also reported that 65% of the study sample consumed less than one vegetable serving per day. Legumes, soya products and nuts were not consumed by 66% of the population and only 30% consumed canned baked beans and/or soup powders. Bread intake was high as the majority of the sample admitted to having bread for all three meals. Foods such as maize meal, jeqe (steamed bread), samp and beans which form part of the traditional eating habits were rarely eaten. The study also found that the diet of the students was not in accordance with the South African Food Based Dietary Guidelines (FBDGs). More reasonably priced food choices are of a higher energy density and low

nutrient content, whereas fruits and vegetables which have a higher nutrient density are often more costly (Oldewage-Theron & Egal 2010).

Among 269 financial aid students, the intake of staple foods namely bread, rice, potato, samp, breakfast cereal and porridge was highest while fruit, vegetable and milk were the least consumed (Kassier & Veldman 2013). However, the high fat content of their diet was obvious from the intake of cooking oil, margarine, mayonnaise, cakes, doughnuts and sweets. Students from low socio-economic backgrounds on financial aid are more prone to the negative effects of food insecurity as they are more prone to consuming affordable foods which are nutritionally compromised, i.e. high in energy and low in micronutrients (Rose 2010). Such foods are generally ready-made, concentrated in fats and are energy dense. It is reported that low income individuals usually have difficulty in accessing fresh fruits and vegetables. Hence, they choose to spend their money on cost effective foods, which also increases health risks. When nutritional requirements are not met, the students' health becomes at risk as the likelihood of contracting diet-related diseases are increased (Hughes *et al.* 2011).

2.6 Coping strategies related to food insecurity

Coping Strategies are described as “all the strategically selected acts that individuals and households of poor socio-economic position use to restrict their expenses or earn extra income to enable them to pay for their basic necessities and not fall below their society's level of welfare” (Snel & Staring 2001). Procuring food to obtain sufficient nutrition for themselves and their household is one of the basic human struggles for survival. Usually people react to circumstances when they do not have food and come up with numerous ways of ‘coping’ which is what they have to do when they do not have sufficient food. The more people have to find ways to cope, the less food secure they are. People are normally aware of how much is “enough” and look for the best possibilities for safeguarding sufficient food consumption. In addition, they begin to alter their eating habits when they anticipate a financial problem and do not wait until food is lacking (Christaensen & Boisvert 2000).

Minor dietary changes such as eating less-preferred foods or cutting down on portion size are easily reversible strategies that do not threaten long lasting adverse health outcomes. However, more intense behaviours such as selling assets indicate a more severe long-term

concern (Devereux 1993). Research stresses that households and individuals can opt for any strategy or combination of strategies depending on how desperate their situation is, i.e. the type of strategies and the progression of their implementation represent the level of food insecurity and vulnerability of the household or individual (Maxwell 1996). As food insecurity aggravates, households are more liable to opt for means that are less reversible and hence signify a more severe practice of coping and greater food insecurity (Devereux 1993).

Coping strategies can be divided into two principal categories; the first one is the immediate and short-term modification of eating patterns and the other consists of the longer-term change of earning an income or food production patterns and one-off responses such as selling possessions (Maxwell 1996). It has been reported that managing short-term intake approaches is a defined indicator of acute food security (Coates, Frongillo, Rogers, Webb, Wilde & Houser 2006). Households facing food insecurity make use of four forms of coping strategies listed below:

- Dietary change – household may shift their eating habits from preferred foods to cost effective, less favoured foods (Maxwell & Caldwell 2008).
- Short-term measures to increase household food availability – households make an effort to extend food supplies using short-term approaches that cannot be maintained for a long period of time. For instance, borrowing or purchasing food items on credit, begging for food, eating wild food, undeveloped crops or even seed stocks (Maxwell & Caldwell 2008).
- Short-term measures to decrease the number of people to feed – in case the amount of food available is insufficient to meet the requirement, the household can attempt to decrease the number of people, generally children, they have to feed by sending them to eat elsewhere, usually at other relatives, neighbours or friends (Maxwell & Caldwell 2008).
- Rationing or managing shortfall – households use rationing as the most common strategy to cope with food shortage. They reduce portion sizes, the number of meals they eat during the day, favour certain members of the household over others, skip meals or going without food for days (Maxwell & Caldwell 2008).

When students are faced with food instability and availability, several coping strategies are used. Food theft is considered as a way to obtain food in emergencies (Hughes et al. 2011). Stealing food in student residences negatively affects food stability and food availability

which are important aspects in maintaining food security (Hart 2009). Unreliable food supplies will persist until provisions are made to replace what has been stolen. Therefore, the problem of theft will prevail until food insecurity is dealt with at university residences. However, it is not only food that is being stolen on university premises. It has been reported that student resort to criminal activities in order to obtain money to pay their tuition fees, in addition to food. Furthermore, female students have progressively resorted to granting sexual favors for money to fulfil their needs for food, clothing and other expenses (Govender 2008). It was also reported that students at the University of Pretoria have been resorting to prostitution on the streets to pay for their accommodation, clothing and food. It was also reported that their families cannot support them as they themselves are in financial crisis (Nyamayaro 2015).

Studies conducted have demonstrated how the South African population copes with food insecurity. Shisanya & Hendricks (2011) reported 83% of the 53 rural households had smaller meals and 91% had fewer meals. Nyakurimwa (2011) stated that among the 44 respondents surveyed, hunger was linked to not having enough to eat, but admissions related to the fact that relocation to urban areas was to find employment, while women reported to be resorting to prostitution as a source of income. An investigation among 200 rural households reported just over two thirds (67%) reported to be eating seed stock for months (Mjonono 2008). Selling possessions and borrowing money were used by 52.5% of the households surveyed. Of 268 households surveyed, 91% revealed to be consuming less preferred and affordable foods (Ngidi 2007). On 357 subjects surveyed by Oldewage-Theron, Dicks, Napier (2006) in the Vaal Triangle, 68.8% reported to be earning a monthly income of less than R500, while 70.5% of the students stated that they frequently lack of money and 58.3% admitted to spending less than R100 per week on food. In order to cope with their situation, 74.7% indicated that they were limiting the variety of food served, 80% were reducing their portion sizes and 68.4% were skipping meals. Hence, it was concluded that communities facing poverty and food insecurity alter their dietary habits and intake to cope with their situation, resulting in compromised nutrition.

It is acknowledged that university students have continuously been sustained on less-than-nutritious food and are significantly affected by food costs, which makes it difficult for them to safeguard their next meal (Shreeves 2010). Among Australian university students, students who faced food insecurity had a part-time job and borrowed money and food in order to cope

with their situation (Hughes *et al.* 2011). Smith & Richards (2008) reported that among the 202 respondents aged 9 to 18 years surveyed, 45% reported not having sufficient food in the house while 25% claimed to go to bed hungry. As coping strategies to food insecurity, participants resorted to eating anything available, consuming less preferred foods and eating with families and friends. Kassier & Veldman (2013) reported 45.5% of 269 financial aid students borrowed money from friends, 16.3% borrowed money from family and 10.6% stated that drinking fluids increased feelings of satiety. Van den Berg & Raubenheimer (2015) reported that 70.5% of 1416 students surveyed did not have money for food, 70.5% revealed that they have been borrowing money to buy food, 53.3% ask others for food, 9.2% reported to have sold their belongings for food and 1.6% confessed to having stolen food.

2.7 Emotional wellbeing of university students

From a psychological perspective, the effect of one's family life on emotional wellbeing is crucial and the impact of educational and financial handicaps, apparent struggle to survive and ability to cope with stress are significant (Beautrais 2010). Hence, an attempt should be made to detect depression amongst first year university students as first year university is a period of transition for most students. It includes a sudden shift in terms of education and learning, coping with the transition of leaving home; being independent, learning new adult responsibilities and being exposed to a new network of people in a new environment (Mojs, Warchol-Bierderman & Samborski 2012). This can be very overwhelming for the majority of them. Mental health care professionals explain that depression, anxiety, stress, substance abuse and mental strain are the possible outcome of the students' being unable to deal with their 'baggage' issues (Steptoe, Wardle, Guliš, Sartory, Sêk, Todorova, Vögele & Ziarkom 2004). Experiences faced due to baggage varies from student to student, but it must be taken into account that dealing with some of the above mentioned problems whilst trying to obtain a university qualification may result in having poor emotional health which will eventually affect overall academic performance (Steptoe *et al.* 2004). It has been reported that students who come from low income backgrounds find it difficult to concentrate on their academic tasks as they do not have sufficient funds to feed themselves and thus think of themselves as being weak (Naidoo 2008).

Students receiving financial assistance have to deal with more stress compared to those who are not on financial aid (Shaikh, Kahloon, Kazmi, Khalid, Nawaz & Khan 2004). This is due

to financial problems as the majority of students on financial aid are from very impoverished circumstances and experience other sources of financial stress even though their tuition fees and lodging may have already been paid for (Shaikh *et al.* 2004). These problems may include the inability to meet daily needs such as food, money to call home, clothing, toiletries, social gatherings and pocket money for wigs and other costs that include printing and photocopying.

Students transitioning from high school to university struggle to cope with the academic workload at university as students are required spend more time on academic work when compared to high school (Bitzer & Troskie-De Bruin 2004). All university programmes require students to spend approximately 18 hours per week on academic tasks out of lecture time, whereas more than a quarter of the students in the study claimed to have spent less than six hours studying for matric in addition to class time. The danger with the abrupt increase in time needed in the first year of university, is that students may be unable to cope with the new academic stresses due to failure to understand what is required of them or poor time management skills (Bitzer & Troskie-De Bruin 2004). Academically underprivileged students in particular, seem to have great trouble in coping with the academic workload in their first year at university (Agar 1990). In the South African context, many disadvantaged students have had an inadequate level of education and are thus expected to be under-prepared for university. These students' educational backgrounds may not have equipped them for managing and surviving with the academic standards of the university. This can further be aggravated by difficulties experienced in reading and studying academic material in their second or third language (Agar 1990).

2.8 Institutional assistance

Undergraduate students have to deal with numerous social, personal and academic problems in the midst of pursuing their studies (Letseka 2007). Students need to cope being away from home, peer pressure and adapting to a new system of learning in a new surrounding. When confronted with depression, health and social challenges; tutoring and counseling services become imperative as a source of support (Malefo 2002). It is important for the university community to put in place 'responsive counseling services' where lecturers, mentors and/or counselors assist as a support system to help students with the difficulties they face, as it can deter their academic performance.

The University of KwaZulu-Natal has a goal to be involved with the society and be a role model being demographically representative of the South African population. Hence, the institution has a student population of which 88% are black students. After being faced with so many statistics regarding food insecurity among students and the fact that Munro *et al.* (2011) stated that 4.7% of students at the University of KwaZulu-Natal are prone to suffering from severe susceptibility to food insecurity, the institution came up with a programme to provide assistance to food insecure students in order to decrease academic drop-out and failure. The University of KwaZulu-Natal launched a Food Security Program (FSP) framework (see Appendix A) in July 2012 which was developed by the Student Services Division to provide students with assistance and support regarding their food security status. The programme aims to inform students about food insecurity and the effects that it has on academic performance as well as their overall socio-economic development. It therefore aims to support responsible students with food vouchers, parcels and to empower students to becoming self-sufficient in order to alleviate poverty. However, this FSP has been in its infancy for the past three and half years and no policy has been passed in order to put this programme into practice throughout the institution (Barnsley 2015).

The College of Agriculture, Engineering and Science has implemented an interim solution (see Appendix B) in 2013 to address the issue of food insecurity whilst awaiting approval from the Food Security Program Framework in its entirety. The allocation of food hampers/vouchers for needy students and their appropriate use will be the responsibility of the College. The eligibility of students is determined according to the following criteria: they have been part of the programme for the first time, come from a poverty-stricken background, receive minimal or no family assistance, prove that student funding has been withdrawn for the current academic year but that the student still owes money to the university, provide proof that they have been trying to find alternative solutions to resolve their problem and supply evidence of other related factors motivated by authorities of the institution. Walk-in students can only be assisted with food hamper/vouchers if they provide a letter of referral from authorities at the institution. To be part of the programme, the students will be screened and evaluated by a student counselor in the College who will determine the student's requirements. Thereafter, students are counselled and assisted in order to improve their skills regarding financial management, addressing their psychological problems and any other factors which might affect them negatively. Records of all students are kept and reported to Student Services on a regular basis. It was reported that in 2013, 24 students, in 2014, 25

students and in 2015, 22 students received food vouchers on the Pietermaritzburg campus that were enrolled within the College of Agriculture, Engineering and Science. The number of students cited is low, despite the level of food insecurity being reported to be high. This is because this service is not advertised and the majority of eligible students do not know that assistance of this nature is available. In addition, the policy has not been approved by management as yet.

UKZN foundation has set up a fund so that members of the public can contribute towards food vouchers/hampers and help to support students. Staff members are also encouraged to contribute towards the fund by donating a small amount of their salary to their benefit of the student community. Each student is provided with one voucher (as shown in Figure 2.1 below) a day which can be redeemed in at the Hex coffee shop on the commerce campus in exchange of a meal. Every voucher has a monetary value of R40 and students are given five vouchers at a time on a weekly basis. However, they are strictly warned that should the vouchers be traded, they will not be provided with any further assistance. The students are provided with a meal on presentation of the voucher and student card to the staff at the coffee shop. The meal consists of a cooked main meal, 500 ml fruit juice, french fries and a choice between a fruit or yogurt. There are five available options as main meals that students can choose from. This includes a pie, beef or chicken burger, macaroni and cheese, wrap or curry and rice/phutu. However, macaroni and cheese, wraps and curry depend on the availability.

<p>47</p> <p>FOOD SECURITY PROGRAMME</p> <p>MEAL VOUCHER 2015</p> <p>Student Number: _____</p> <p>Student Signature: _____</p> <p>Date: _____</p> <p>Staff Signature: _____</p>	<p>UNIVERSITY OF KWAZULU-NATAL PIETERMARITZBURG YAKWAZULU-NATALI</p> <p>DIVISION OF STUDENT SERVICES</p> <p>47</p> <p>FOOD SECURITY PROGRAMME 2015</p> <p>MEAL VOUCHER</p> <p>This entitles the student to one meal as arranged and is not redeemable for cash.</p> <p>Student Number: _____</p> <p>Staff Signature: _____</p> <p>Date: _____</p> <p>This voucher may not be used for any other purpose. Any misuse of this voucher will be considered as a breach of the university's code of conduct.</p>
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Figure 2.1: Example of a food voucher given out to students

2.9 Conclusion

It was documented that students receiving financial aid are more prone to food insecurity. However, financial aid given to underprivileged students is insufficient to cover all the related costs of being a student. This includes food, accommodation, books, stationary and transport. Students who come from economically disadvantaged backgrounds are at an even greater risk of being food insecure. In addition, students' inability to budget for all expenses incurred could lead to food insecurity. Limited student housing at universities result in the majority of students being required to find alternative accommodation which will incur further financial costs, contributing to food insecurity. The stage of the lifespan between the age of 17 and 30 years in turn affects nutritional requirements for both males and females. It has generally been found that students were consuming less nutritious foods of a low quality due to its affordability. Individuals usually come up with numerous ways of 'coping' when they do not have access to sufficient food. Coping strategies fall into two categories, namely immediate and short term changes in eating patterns, and longer-term changes related to income generation or food production patterns as well as once-off responses such as selling possessions. Amongst the difficulties already mentioned, the emotional state of students is another important factor to consider. In addition to their food insecurity status whilst dealing with some of the above mentioned issues, on top of trying to obtain a university qualification, students may have poor emotional health which in turn also affects their academic performance. For these reasons, coping strategies and how students deal with the physical and emotional stress of being food insecure, needs to be investigated and proper student counseling services provided in order to alleviate food insecurity and the factors associated with it.

CHAPTER 3: STUDY METHODOLOGY

3.1 Introduction

This chapter will outline the approach employed to conduct this study, followed by the study design, study population and sample description including the techniques used to sample study participants and collect data. In addition, the validity and reliability of the data will be reported as well as the pilot study, data analysis and ethical considerations.

3.2 Study design

Research design is a procedural strategy that was implemented by the researcher to answer questions in a valid, reliable, objective, accurate and economical manner (Kumar 1996). Various approaches can be adopted when conducting research, but “the approach adopted and the methods of data collection selected will depend on the nature of the inquiry and the type of information required” (Bell 1993, p6). The aim of this study was to investigate food insecurity and related coping strategies among undergraduate students registered for the study at the Pietermaritzburg campus of the University of KwaZulu-Natal. Hence, a cross sectional study design was chosen.

Cross sectional studies weigh both exposure and outcome at a specific point in time among a given population (Margetts, Vorster & Venter 2002). Usually, the way the population is sampled, is determined by the population’s characteristics for both exposure and outcome exhibiting the nutrition related problem in the community (Margetts *et al.* 2002). However, in this case, a cross sectional study design was opted for as the food insecurity and related coping strategies adopted by undergraduate students were investigated. In addition, a comparison was made between students on financial aid as opposed to those not receiving financial aid.

Cross sectional studies are advantageous when investigating the prevalence of knowledge and attitudes towards a particular event or concept (Merrill 2012, p93). Hence, the survey aim was to investigate the prevalence of food insecurity and the related coping strategies among the undergraduate student population sampled. Furthermore, cross sectional studies are regularly conducted to assess the relationship between risk factors and results of concern

(Levin 2006). The cross sectional study design is useful since it is reasonably economic and not time consuming to conduct as no follow up assessments are required. It can estimate the occurrence of the outcome of concern, since it represents the whole population. In so doing, several conclusions and risk factors can be evaluated. Hence, it helps in developing public health strategies, understanding disease aetiology and aids in hypotheses formulation (Levin 2006). However, there is no study design that is flawless. There are drawbacks related to conducting cross sectional studies lie in their inability to determine the causal relationship of the problem and the variability of outcomes if the study is conducted at a different point in time.

3.3 Study population and sample selection

3.3.1 Study population

There were 32 363 contact students at the University of KwaZulu-Natal in 2007 and 5 487 distance learning students. Of the total student body, full-time students numbered 28 273 and part-time 9 577. Of these, 35 516 were South African citizens, 1386 from other SADC countries and 948 students from non-SADC countries (Anon 2007). The study sample consisted of 800 undergraduate university students who were registered at UKZN, Pietermaritzburg campus. The study was conducted in August of the year 2015 over a period of three weeks due to time constraints and had to be stopped due to strikes on campus. The study sample was recruited in order to reflect the study population under investigation so that inferences regarding the study population could be made. Undergraduate students were selected as they were assumed to be novices in terms of their exposure to the university environment and their ability to cope with it. In addition, they are inexperienced and are still adjusting to the transition from school to a tertiary environment. This will aid in gaining an understanding and evaluation of their coping strategies, especially in relation to food insecurity.

3.3.2 Sample Selection

A study sample is a group forming part of a research study from which data is obtained (Fraenkel & Wallen 1993). Sampling is the method of selecting a few individuals from a bigger group to become the base for predicting a fact, situation or outcome regarding the

bigger group (Kumar 1996). In the current study, a convenience sampling technique was used. Hence, 800 participants were recruited in order to achieve a study sample of nearly equal numbers of students on financial aid and those who were not on financial aid at the time of the study. To facilitate recruitment, invitations for participation were randomly handed out to undergraduate students who were present on the Pietermaritzburg campus at the time. The students were invited to be present at the site where the study was being conducted. The site was set up at sites on the different campuses where traffic was the most and random passers-by were requested to participate in the study. The participants were only asked if they were undergraduate students, different subgroups of recipients and non-recipients of financial aid were divided according to their responses, in order to avoid bias.

When conducting a cross-sectional study, it is imperative to include different subgroups, i.e. in the current study of participants, as they may have different views, life experiences or food insecurity related coping behaviours that can contribute to the research findings (Fraenkel & Wallen 1993). For example, males and females may have different coping behaviours and different views. So, when gathering data from a diverse population, it must be ensured that the relevant subgroups of financial recipient and non-financial recipients, gender and ethnic groups are adequately represented in the study sample.

3.4 Study methods and materials

3.4.1 Measuring instruments

Measuring instruments are tools, which enables quantitative and qualitative data collection (Cogill 2003). A self-administered questionnaire was developed for the purpose of the study to investigate the prevalence of food insecurity and related coping strategies among undergraduate participants on the Pietermaritzburg campus of UKZN. The HFIAS scale and an adapted version of the CSI were used for collecting data. A brief explanation of the above instruments and their development is given below.

3.4.1.1 Questionnaire design

A questionnaire is a formalized arrangement of questions used to collect information from respondents. It includes any kind of instrument that has items or questions to which

individuals respond to directly (Cogill 2003) as well as being the main method of gathering quantitative primary data. The self-administered survey questionnaire developed for the purpose of the study, was based on a theoretical framework developed from available literature and consisted of both open- and close-ended questions in order to determine the subjects' socio-demographic data, socio-economic status and food security status. The questionnaire consisted of 38 questions which were divided into four sections in order to simplify the interpretation of data collected (refer to Appendix C). The majority of questions were closed-ended with options for additional comments if the response did not fall within the scope of the options provided. Questions were developed in accordance with the study objectives, while language was kept simple and leading questions were avoided.

Section A consisted of 12 questions related to the socio demographic background of the subjects. This included age, gender, race and the degree they were enrolled for to ensure they were eligible for participation. This section also included questions regarding the participants' place of residence and available water source to gain insight about their household background and their socio-economic status. Section B was related to the financial status and related factors of the participants. The section consisted of eight questions which were related to how their finances are sourced and managed on a monthly basis. It also included information as to whether participants were on financial aid or were the recipients of bursaries. Section C was a non-quantified food frequency questionnaire, which served as an indicator of subjects' eating habits and purchase preferences which in turn could be indicative of the affordability of food items. It also provided an understanding of the participants' level of dietary diversity.

Section D comprised of 17 questions related to food security. The participant's food security status was investigated by means of hunger and food preparation questions. This section also included questions regarding the available appliances to facilitate cooking and food storage as these variables were indicative of socio-economic status. The measurement of an individuals' food security status by HFIAS and coping strategies adopted by participants is also investigated by an adapted CSI.

3.4.1.2 Household Food Insecurity Access Scale

The HFIAS (refer to Appendix D) was used to determine the food security status of the study sample. Since the instrument is used to measure household food security, it was adapted by the researcher to measure individual food security status. The original tool was therefore merely reworded to make it relevant for the purpose of the current study. This tool was incorporated as question 37 in the questionnaire. Usually, the HFIAS tool is used as a standalone instrument; however it was added as a question to the questionnaire to facilitate respondents' participation.

The HFIAS score measures the extent of food insecurity of an individual over the past four weeks. To begin with, a HFIAS score is calculated for each individual by adding up the scores for each frequency-of-occurrence question. The frequency-of-occurrence was coded as zero (0) for all cases where the answer to the corresponding occurrence question was "Never". A response code of one, two and three were given for all the cases where the answer to the corresponding occurrence question was "rarely", "sometimes" and "often", respectively. The maximum score for an individual would add up to 27 if the individual response to all nine frequency-of-occurrence questions was "often". The minimum score would be 0 if the individual responded "no" to all frequency-of-occurrence questions. Hence, the higher the HFIAS score, the more food insecurity the individual experienced and the lower the score, the less food insecurity an individual experienced (Coates *et al.* 2006). The table below illustrates the HFIAS categories that were used for the purpose of this study.

Table 3.1: Categories of food security forming part of the HFIAS

HFIAS category	HFIAS score
Food secure	0 - 6.24
At risk of food insecurity	6.25 - 13.49
Food insecure	13.5 - 20.74
Severely food insecure	20.75 – 27

Source: Coates *et al.* 2006

The HFIAS occurrence questions refer to three domains of food insecurity. This could be explained as follows:

- Concern and ambiguity about the household food supply (referred to by question 1);

- Inadequate quality, which includes variety and preferences of food (referred to by question 2, 3 and 4); and
- Inadequate food consumption and its physical consequences (referred to by questions 5,6,7,8 and 9).

The HFIAS instrument classifies participants according to four stages of household food insecurity in relation to their increasing food insecurity:

- Food secure;
- At risk of food insecurity implying being mildly food insecure;
- Food insecure which infers being moderately food insecure; and
- Severely food insecure.

A mildly food insecure respondent is one who worries about not having sufficient food ‘sometimes’ or ‘often’, and/or is unable to eat preferred foods, and/or eats a more repetitive diet than desired and/or some foods believed to be undesirable, but only ‘rarely’. Hence, such a person does not reduce the quantity consumed nor experiences any of the three most severe conditions such as running out of food, going to bed hungry or going without food for a whole day and night (Coates *et al.* 2006).

Moderately food insecure subjects compromise on quality more frequently by consuming monotonous diets or undesirable foods ‘sometimes’ or ‘often’, and/or have started to diminish their quantity of intake by reducing the size of meals or number of meals eaten ‘rarely’ or ‘sometimes’. However, they do not experience any of the three most severe situations of food insecurity (Coates *et al.* 2006).

Severely food insecure subjects reduce their meal sizes or number of meals ‘often’, and/or experience any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even if only ‘rarely’. Therefore, any subject that experiences one of these three conditions even once over the past four weeks is regarded as severely food insecure (Coates *et al.* 2006).

The Table 3.2 illustrates the HFIAS food insecurity categories according to the nine questions.

Table 3.2: HFIAS illustrating the food insecurity categorization scheme

	Frequency			
Question	Never (0)	Rarely (1)	Sometimes (2)	Often (3)
1				
2				
3				
4				
5				
6				
7				
8				
9				

Source: Coates *et al.* 2006

	Food secure		Moderately food insecure
	Mildly food insecure		Severely food insecure

3.4.1.3 Coping Strategy Index

The Coping Strategies Index (CSI) is an instrument that is used to determine household food security. It was incorporated as question 38 of the questionnaire to ease respondents' participation. It is a straightforward instrument which does not take a lot of time to complete and is easy to understand. A group of easy and uncomplicated questions can be formulated to acquire an understanding of people's basic diet related coping mechanisms to inadequate access to food within a given culture or location (Maxwell & Caldwell 2007). Three key aspects reinforce the CSI tool. Firstly, the answers to the general question must be based on the right list of coping behaviours, which is a significant principle of constructing the CSI. Hence, there is no point in asking people about strategies they do not implement. Likewise, care must be taken not to oversee approaches that are used in a local context. Specific coping behaviours vary depending on circumstances. As a result, the list must be adapted to local circumstances and practices. Secondly, the frequency of these specific behaviours used in the recent past must be considered. Thirdly, the severity of each of these individual coping strategies should be considered. This information is collected from community-level focus groups and provides a weight for the perceived severity of each strategy (Maxwell & Caldwell

2007). Various strategies are evaluated differently based on how extreme they are considered by the population being surveyed then the total score is tallied. However, for the purpose of the current study no focus group was conducted and the CSI was adapted to evaluate frequency of the coping mechanism adopted by the study sample. Only coping strategies relevant to the respondents in the sample population in question was included and those related to household and livestock was excluded.

3.4.2 Data collection

A self-administered questionnaire developed for the purpose of the study was used in the pilot study as well as the actual survey. Participants were invited to complete the self-administered questionnaire at a suitable location with the most traffic on the Pietermaritzburg Campus. Random passers-by were requested to participate in the study. Two field workers namely trained undergraduate Dietetics students, were recruited to measure weight and height. Before participation, subjects were required to sign an informed consent form (refer to Appendix E). After participants gave their signed consent, they proceeded to a quiet enclosed area on Main Campus, Commerce Campus and Life Science Campus, which was set up for the study where they had their anthropometrics taken by the field workers. Weight and height was measured by trained field workers before participants completed their questionnaires.

Weight and height were measured in accordance with the International Society for the Advancement of Kianthropometry (ISAK) standards. Weight was measured to the nearest 0.1 kg with participants wearing no shoes and light indoor clothing. Participants were requested to remove any heavy clothing such as jackets and empty their pockets before their weight and height was measured. Free standing height was measured in metres to the nearest 0.1 cm with participants wearing no shoes. For this measurement, participants were requested to remove caps, headgears, undo ponytails or hair extensions where possible in order to obtain an accurate height measurement. Weight and height measurements were repeated twice and the mean of the two measurements were recorded. If there was a discrepancy between the measurements, a third measurement was taken and the mean of the two closest measurements was calculated. The height and weight of each participant were measured with the help of a free standing Leicester stadiometer and a portable SECA scale with a capacity of 200 kg.

From the information recorded, the BMI of the participants was calculated by dividing weight by height in metres squared [$BMI = \text{Weight (kg)} / \text{Height (m}^2\text{)}$] (WHO 2004). One field worker was assigned to only take weight measurements while one field worker was assigned to only taking height measurements. Assistance was provided by trained field worker to ensure that subjects completed the questionnaires to the best of their ability.

3.5 Pilot study

Pre-testing a questionnaire increases participant understanding, relevance, avoids ambiguity, and establishes validity and reliability within a research study (Anon 2015b). Hence, a pilot study was conducted to test the questionnaire for the above aspects. The pilot study was conducted on ten participants who were conveniently sampled from the study population conducted in a period of one day. The methodology employed for the pilot study was similar to that used for data collection in the main study. The purpose of piloting is to obtain feedback regarding the clarity of questions, i.e. do they need to be reworded, ambiguity of the questions and to guard against respondent fatigue. Pilot testing also comprises of evaluation of other aspects such as precision and accuracy (Anon 2015b). Those attributes are essential to developing a questionnaire from which results are reproducible, providing a good magnitude of the phenomenon or phenomena of interest. As subjects answered the questionnaire in a satisfactorily and the questionnaire was not found to be ambiguous, no subsequent changes were necessary prior to commencement of data collection.

3.6 Variables included in the study, data capturing and statistical analysis

The raw data from the survey questionnaires was captured on a spreadsheet, imported and analysed using the IBM Statistical Package for the Social Sciences (SPSS) version 22. The study objectives, study variables and statistical analysis conducted is reported in the relationship between variables were studied by the means of descriptive and inferential statistics and the level of significance assessed with a p value < 0.05.

Table 3.3 below demonstrated the statistical analysis of the information.

Table 3.3: Statistical analysis of data

Objectives	Variables required for the analysis	Related statistical tests
Socio-demographic characteristics	<ul style="list-style-type: none"> • Age • Race • Gender • UKZN College • Academic year of study • Place of residence during term • Relationship status • Living with partner • Number of children • Place of household • Number of people in household • Number of rooms in household • Household ownership • Water source 	<ul style="list-style-type: none"> • Frequency distribution • Chi square tests • Descriptive statistics
Anthropometrics	<ul style="list-style-type: none"> • Weight • Height • BMI • Gender 	<ul style="list-style-type: none"> • Chi square tests • Frequency distributions
Prevalence of food insecurity	<ul style="list-style-type: none"> • IFIAS • Gender 	<ul style="list-style-type: none"> • Frequency distributions • Chi square tests
Financial situation	<ul style="list-style-type: none"> • Part-time job • Financial aid or bursary • Allowance • Grant received • Monthly expenditures • Assisting financially from bursary/income/financial aid • Bursary difficulties • Mother's employment status • Father's employment status 	<ul style="list-style-type: none"> • Frequency distributions • Chi square tests • Descriptive statistics

Table 3.3(continued): Statistical analysis of data

Objectives	Variables required for the analysis	Related statistical tests
Factors influencing food insecurity	<ul style="list-style-type: none"> • UKZN food voucher use • Influence of food prices • Time for food preparation • Facilities for food preparation • Reasons for missed lectures • Reason of hunger • Most hungry during semester • Most hungry during the day • Safe place for food storage • Have had food stolen • Weight loss • Frequency of lack of variety 	<ul style="list-style-type: none"> • Frequency distributions • Chi square tests • Descriptive statistics
Dietary diversity	<ul style="list-style-type: none"> • Food frequency 	<ul style="list-style-type: none"> • Descriptive statistics • Frequency distributions • Chi square tests
Coping strategies adopted	<ul style="list-style-type: none"> • Adapted CSI • Approaches used in case of food shortage • Sale of assets 	<ul style="list-style-type: none"> • Frequency distributions • Descriptive statistics • Chi square tests

3.7 Data quality control

Data quality control is done to ensure that the data collected from the study is valid and reliable.

3.7.1 Reliability

If a research tool is consistent, hence, predictable and accurate, it is said to be reliable. Reliability is related to the ‘extent to which a test or procedure produces similar results under constant conditions on all occasions’ (Bell 1993, p64). However, accuracy and validity cannot be ensured (Babbie & Mouton 2001). Reliability of the self-administered questionnaire were ensured by compiling an extensive theoretical framework covering the concepts and subsequent expert consultation to confirm core subjects to be covered in the questionnaire. All field workers were Dietetic students who received training in accordance

to the ISAK standards hence the methods of data collection were similar. All subjects were given the same questionnaire which was completed under the same conditions. The field workers were available throughout the data collection process to attend to any queries the participants may have had to ensure that results were reliable.

3.7.2 Validity

Validity is the ability of a research tool to measure what it is supposed to measure. The inferences drawn should be appropriate, meaningful and useful (Fraenkel & Wallen 1993, p139). It refers to the extent to which the research conclusions are comprehensive, including the degree to which documented information adequately represents the actual meaning of the concept being studied (Babbie & Mouton 2001). Questions used in both tested tools such as HFIAS and CSI that was related to the study objectives so that face and content validity was ensured. The avoidance of respondent fatigue and expert input from two academics with relevant experience in the field to ensure construct validity.

3.8 Ethical considerations

For the purpose of this study, ethical approval was applied for from the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal and an ethics number HSS/0150/012M was given. Before participation, participants needed to read and sign an informed consent form. Participation in the study was voluntary and respondents were allowed to withdraw at any stage without prejudice or negative consequences and non-participation would not affect the individual. The informed consent form and information sheet ensure that the subjects had a clear understanding of the study and what their participation involved. Participants were clearly informed of their rights and any potential risks, harms and benefits associated with participation in the study.

CHAPTER 4: RESULTS

4.1 Introduction

The aim of this study was to investigate the prevalence of food insecurity and related coping strategies among undergraduate students registered at the University of KwaZulu-Natal, Pietermaritzburg campus. This chapter will report the study results in relation to the study objectives reported in Chapter 1, as well as the socio-demographic characteristics of the study sample.

4.2 Sample socio-demographic status

The study sample consisted of 800 participants with a gender distribution of 41.1% (n = 329) males and 58.9% (n = 471) females. The mean age of the study sample was 20.5±2.0 years.

Table 4.1 provided an overview of the socio-demographic characteristics of the study sample in relation to whether they were recipients of financial aid or not.

Table 4.1: Socio-demographic characteristics of study sample according to whether they are recipients or non-recipients of financial aid (N = 800)

		Non-financial aid (n = 434)		Financial aid (n = 366)		Total (N = 800)		p value [#]
		n	%	n	%	n	%	
Gender	Female	247	30.9	224	28.0	471	58.9	NS
	Male	187	23.4	142	17.8	329	41.1	NS
Race	Black	339	42.4	351	43.9	69.	86.3	NS
	Indian	68	8.5	8	0.1	76	9.5	NS
	Coloured	13	1.6	6	0.8	19	2.4	NS
	White	14	1.8	1	1	15	1.9	NS

[#]Chi-squared test with p < 0.05 considered significant

Table 4.1(continued): Socio-demographic characteristics of study sample according to whether they are recipients or non-recipients of financial aid

		Non-financial aid (n = 434)		Financial aid (n = 366)		Total (N = 800)		p value[#]
		n	%	n	%	n	%	
College	Agriculture, Engineering & Science	143	17.9	208	26.0	351	43.9	0.00
	Law & management	137	17.1	86	10.8	223	27.9	0.00
	Humanities	153	19.1	69	8.6	222	27.8	0.00
	Health Sciences	1	0.1	3	0.4	4	0.5	NS
Academic year	1	183	22.9	125	15.6	308	38.5	NS
	2	150	18.8	127	15.9	277	34.6	NS
	3	86	10.8	104	13.0	190	23.8	NS
	4	15	1.9	10	1.3	25	3.1	NS
Relationship status	Single	308	38.5	272	34.0	580	72.5	NS
	In a relationship	120	15.0	90	11.3	210	26.3	NS
	Married	6	0.8	4	0.5	10	1.3	NS
Living with partner	No	112	50.9	82	37.3	194	88.2	0.05
	Yes	12	5.5	14	6.4	26	11.8	NS
Has children	No	387	48.4	320	40.0	707	88.4	NS
	Yes	47	5.9	46	5.8	93	11.6	NS
Number of children	1	35	37.6	39	41.9	74	79.6	NS
	2	5	5.4	8	8.6	13	14.0	NS
	3	1	1.1	3	3.2	4	4.3	NS
	9	1	1.1	0	0	1	1.1	NS
Living with children	Not applicable	393	49.1	316	39.5	709	88.6	NS
	No	33	4.1	45	5.6	78	9.8	NS
	Yes	8	1	5	0.6	13	1.6	NS
Residence during term	Student residence	95	11.9	238	29.8	333	41.6	0.00
	Off campus accommodation	168	21.0	92	11.5	260	32.5	0.01
	Home	171	21.4	36	4.5	207	25.9	0.00

[#]Chi-squared test with p < 0.05 considered significant

Table 4.1(continued): Socio-demographic characteristics of study sample according to whether they are recipients or non-recipients of financial aid

		Non-financial aid (n = 434)		Financial aid (n = 366)		Total (N = 800)		p value[#]
		n	%	n	%	n	%	
Location of family home	Town outside Pietermaritzburg	189	23.6	233	29.1	422	52.8	0.00
	Suburb in Pietermaritzburg	177	22.1	77	9.6	254	31.8	0.00
	Another province	29	3.6	29	3.6	58	7.3	NS
	Central Pietermaritzburg	26	3.3	24	3.0	50	6.3	NS
	Another country	13	1.6	3	0.4	16	2.0	NS
House ownership	Owned by parent/guardian	385	48.1	320	40.0	705	88.1	NS
	Rented by parent/guardian	38	4.8	23	2.9	61	7.6	NS
	Occupied free of charge	6	0.8	16	2.0	22	2.8	NS
	No permanent residence	5	0.6	7	0.9	12	1.5	NS
Household water source	Tap inside	369	46.1	244	30.5	613	76.6	NS
	Communal tap	26	3.3	66	8.3	92	11.5	NS
	Jojo tank	15	1.9	18	2.3	33	4.1	NS
	River	8	1	13	1.6	21	2.6	NS
	Tap inside & Jojo tank	7	0.9	3	0.4	10	1.3	NS
	Communal tap & Jojo tank	3	0.4	3	0.4	6	0.8	NS
	Rain water	0	0	6	0.8	6	0.8	NS
	Tap inside & communal tap	1	0.1	4	0.5	5	0.6	NS
	Communal tap, Jojo tank & rain water	1	0.1	3	0.4	4	0.5	NS
	River & Jojo tank	2	0.3	1	0.1	3	0.4	NS
	River, Jojo tank & rain water	1	0.1	2	0.3	3	0.4	NS
	River & rain water	1	0.1	1	0.1	2	0.3	NS
	Communal tap & rain water	0	0	2	0.3	2	0.3	NS

[#]Chi-squared test with $p < 0.05$ considered significant

From table 4.1, it could be seen that 54.3% (n=434) of the study sample were non-recipients of financial aid whilst 45.8% (n=366) were on financial aid. The study sample consisted of 41.1% (n = 329) males of which 43.2% (n=142) were on financial aid and 58.9% (n=471) females of which 47.6% (n=224) were on financial aid. It was evident that the majority of participants were black (86.3%), followed by Indians (9.5%), Coloured (2.4%) and Whites (1.9%). The majority of participants on financial aid were black (43.9%).

The majority of participants were from Agriculture, Engineering and Science (43.9%) followed by Law and Management, Humanities and Health Sciences at 27.9%, 27.8% and 0.5% respectively. It was found that there were significantly more participants on financial aid (26.0%) within the College of Agriculture, Engineering and Science compared to participants who did not receive financial aid (17.9%). There were significantly more non-recipients of financial aid (17.1%) within the College of Law and Management compared to those who received financial aid (10.8%). Significantly more participants who were not on financial aid (19.1%) within the College of Humanities compared to those who received financial aid (8.6%). The majority of participants were in their first and second year of study at 38.5% and 34.6% respectively, followed by third years at 23.8% and the least number of fourth years at 3.1%.

The majority of participants were single (72.5%), followed by 26.3% who were in a relationship and 1.3% who were married. Of the 220 participants who stated that they are in a relationship or married, 11.8% lived with their partners. It was found that of the 220 participants who lived with their partners, there were statistically significantly more participants not receiving financial aid (50.9%) who were not living with their partners compared to participants who were on financial aid (37.3%). 11.6% of participants had children, with the majority (79.6%) having one child as well as being on financial aid. Of the 13 participants whose children lived with them, 46.2% were taken care of by the participants' mothers, 23.0% left their children at a Day Care Centre, 15.4% had child minders and the remainder were taken care of by child minders or the first born child.

During term, 41.6% of participants lived in student residence, 32.5% lived in off campus accommodation while 25.9% lived at home. The majority of participants resided in Scottsville (74.0%), followed by central Pietermaritzburg (6.4%) and Imbali (4.5%). Statistically significantly more participants on financial aid (29.8%) lived in student residence

compared to those who were not on financial aid (11.9%). There was significantly more non-recipients of financial aid (21.0%) who resided off campus compared to participants on financial aid (11.5%). Significantly more participants who were not on financial aid (21.4%) lived at home, compared to those on financial aid (4.5%).

Over half (52.8%) of participants lived outside Pietermaritzburg while 38.0% resided in Pietermaritzburg. More participants on financial aid living outside Pietermaritzburg (29.1%) as opposed to living in Pietermaritzburg (23.6%). In addition, more recipients of financial aid (29.1%) resided outside of Pietermaritzburg compared to those not on financial aid (23.6%). Significantly more participants who did not receive financial aid (22.1%), lived in suburbs in Pietermaritzburg compared to participants on financial aid (9.6%).

When participants were asked about the ownership of their family home, 88.2% owned their own homes, 7.6% were renting, 2.8% occupied their households free of charge and 1.5% did not have a residence. When questioned about the water source of their family homes, 78.5% had running water inside the house, 13.0% were using communal taps in combination with other sources such as Jojo tanks, rivers and rain water, while 8.5% of the homes did not have access to a communal tap and made use of Jojo tanks, rain water, river water or a combination of the latter sources. The family of participants on financial aid reported a mean of 4 ± 1.7 bedrooms that were shared among a mean of 6 ± 2.8 people. The family of non-recipients of financial aid reported a mean of 4 ± 1.6 bedrooms to be shared among a mean of 5 ± 2.4 people.

4.3 Body Mass Index

In Table 4.2, the height, weight and BMI of participants were reported in accordance to whether they were recipients of financial aid or not.

Table 4.2: Height, weight and BMI of participants on financial aid versus those not on financial aid (N = 800)

	Non-financial aid n = 434	Financial aid n = 366	Total N = 800	p value[#]
Weight (kg)	67.1 ± 14.8	65.4 ± 11.9	66.3 ± 13.6	NS
Height (m)	1.66 ± 0.10	1.65 ± 0.86	1.65 ± 0.91	NS
BMI (kg/m²)	24.4 ± 5.0	24.2 ± 4.5	24.3 ± 4.8	NS

[#]Chi-squared test with $p < 0.05$ considered significant

From the above table, it was evident that the mean height of the study sample (N = 800), was 1.65 ± 0.91 m, the mean weight was 66.3 ± 13.6 kg and the mean BMI was 24.3 ± 4.8 kg/m². Participants who receive financial aid had a mean weight of 65.4 ± 11.9 kg, a mean height was 1.65 ± 0.86 m and a mean BMI of 24.2 ± 4.5 kg/m². Participants who did not receive financial aid had a mean weight of 67.1 ± 14.8 kg, a mean height of 1.66 ± 0.10 m and a mean BMI of 24.4 ± 5.0 kg/m². The mean weight, height and BMI of participants who did not receive financial aid was slightly higher compared to those on financial aid. However, there were no significant difference in height, weight and BMI versus non-recipients of financial aid when comparing participants on financial aid.

Table 4.3 presented the BMI of male versus female participants according to whether they were on financial aid or not.

Table 4.3: BMI of male versus female participants in accordance to financial aid status (N=800)

BMI category	Non-financial aid n = 434				Financial aid n = 366				Total N = 800	
	Male		Female		Male		Female		n	%
	n	%	n	%	n	%	n	%		
< 18.49 kg/m ²	7	2.1	17	3.6	7	2.1	7	1.5	38	4.8
18.50-24.99 kg/m ²	129	39.2	125	26.5	110	33.4	112	23.8	476	59.5
25.00-29.99 kg/m ²	34	10.3	56	11.9	19	5.8	62	13.2	171	21.4
30.00-34.99 kg/m ²	11	3.3	36	7.6	6	1.8	34	7.2	87	10.9
35.00-40.00 kg/m ²	4	1.2	11	2.3	0	0	6	1.3	21	2.6
≥40.00 kg/m ²	2	0.6	2	0.4	0	0	3	0.6	7	0.9

From table 4.3, 59.5% (n=476) participants were of a normal weight, 4.8% (n=38) were underweight, 21.4% (n=171) were overweight, 10.9% (n=87) were obese class I, 2.6% (n=21) were obese class II and 0.9% (n=7) were obese class III. 35.8% (n=286) of then study sample were overweight/obese. The mean BMI of females was higher than that of males at 25.3 ± 5.3 kg/m² versus 23.2 ± 4.5 kg/m² respectively. Just over a half (50.3%) of female participants had a normal weight while 5.1% (n=24) were underweight and 44.6% (n=210) were overweight and obese. There were more females on financial aid who were overweight and obese than non-recipients of financial aid. Among male participants, 72.3% (n=238) had a normal weight, 4.3% (n=14) were underweight and 23.1% (n=76) were overweight and obese. The majority of male participants who were overweight and obese were not on financial aid. The statistical significance of the different BMI categories could not be calculated as none of these differences were significant due to small sample sizes within each category.

Table 4.4 reported a comparison of the mean weight, height and BMI between financial aid participants and non-financial aid participants in terms of gender.

Table 4.4: Comparison of the mean weight, height and BMI in terms of gender between recipients and non-recipients of financial aid (N=800)

		N		Mean		SD		p value [#]	
		Male	Female	Male	Female	Male	Female	Male	Female
Height (m)	FA*	142	224	1.72	1.60	0.06	0.06	0.140	NS
	NFA*	187	247	1.74	1.60	0.07	0.07		
Weight (kg)	FA*	142	224	66.3	64.8	11.0	12.3	0.001	NS
	NFA*	187	247	71.1	64.0	14.5	14.3		
BMI (kg/m²)	FA*	142	224	22.4	25.3	3.1	4.9	0.008	NS
	NFA*	187	247	23.5	25.0	4.3	5.3		

[#]Chi-squared test with $p < 0.05$ considered significant

*NFA: Non-recipients of financial aid; FA: recipient of financial aid

From Table 4.4 a statistical significance of height, weight and BMI was found among males on financial aid versus those not receiving financial aid. However, there were no statistically significant differences between female recipients versus non-recipients in terms of the same variables. Male participants not receiving financial aid were taller than those on financial aid. In addition, males on financial aid weighed significantly more than that not on financial aid. As a result, the BMI of male participants receiving financial aid was higher than for that not on financial aid.

Table 4.5 illustrated the comparison of males versus females of the study sample in accordance to receipt of financial aid or not.

Table 4.5: Comparison of gender of study sample in accordance to receipt of financial aid or not

		n		Mean		SD		p value[#]	
		FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*
Height (m)	Male	142	187	1.71	1.74	0.06	0.07	0.000	0.000
	Female	224	247	1.60	1.60	0.06	0.07		
Weight (kg)	Male	142	187	66.3	71.1	11.0	14.5	NS	0.000
	Female	224	247	64.8	64.0	12.3	14.3		
BMI (kg/m²)	Male	142	187	22.4	23.5	3.1	4.3	0.000	0.002
	Female	224	247	25.3	25.0	4.9	5.3		

*NFA: Non-recipients of financial aid; FA: recipients of financial aid

[#]Chi-squared test with $p < 0.05$ considered significant

Males not on financial aid were significantly taller than males on financial aid; however, females had the same height. Males not on financial aid had a higher BMI compared to those on financial aid and females on financial aid had a higher BMI compared to females not on financial aid. Females had significantly higher BMI when compared to males among those on financial aid.

4.4 Employment status, sources of income and related factors

Table 4.6, the employment status, sources of income and related factors were reported in relation to whether participants were on financial aid or not.

Table 4.6: Employment status, sources of income and related factors of participants according to financial aid status

		Non-financial aid n = 434		Financial aid n = 366		Total N = 800		p value[#]
		n	%	n	%	n	%	
Looking for a part time job	Yes	252	31.5	228	28.5	480	60.0	NS
	No	182	22.8	138	17.3	320	40.0	NS
Holding a part time job	No	382	47.8	335	41.9	717	89.6	NS
	Yes	52	6.5	31	3.9	83	10.4	NS
Receiving additional allowance	Yes	427	53.4	186	23.3	613	76.6	NS
	No	13	1.6	180	22.5	187	23.4	NS
Amount of allowance received	R500-1000	85	14.0	54	8.9	139	22.9	0.000
	R100-500	74	12.2	63	10.4	137	22.6	0.000
	>R2500	84	13.8	13	2.1	97	16.0	NS
	R1000-1500	67	11.0	27	4.4	94	15.5	NS
	R1500-2000	59	9.7	22	3.6	81	13.3	NS
	R2000-2500	55	9.1	10	1.7	65	10.7	NS
Receiving government grant	No Grant	424	53.0	341	42.6	765	95.6	NS
	Child support	9	25.7	15	42.9	24	68.6	0.012
	Disability	0	0	5	14.3	5	14.3	NS
	Foster child care	1	2.9	3	8.6	4	11.4	NS
	Child dependency	0	0	2	5.7	2	5.7	NS
Experiencing difficulties in obtaining a bursary	Yes	241	30.1	57	7.1	298	37.2	0.000
	No	204	25.5	298	37.3	502	62.8	NS
Assisting family/friends/partner with income/bursary	Yes	416	52.0	243	30.4	659	82.3	NS
	No	18	2.3	123	15.4	141	17.6	NS

[#]Chi-squared test with $p < 0.05$ considered significant

Table 4.6(continued): Employment status, sources of income and related factors of participants according to financial aid status

		Non- financial aid n = 434		Financial aid n = 366		Total N = 800		p value[#]
		n	%	n	%	n	%	
Amount of bursary/loan/ income given to family/friends/ partner	R100-200	3	2.1	48	34.0	51	36.2	0.000
	R200-400	2	1.4	28	19.9	30	21.3	0.000
	R400-600	3	2.1	19	13.5	22	15.6	NS
	R0-100	5	3.6	9	6.4	14	9.9	NS
	R800-1000	2	1.4	7	5.0	9	6.4	NS
	R600-800	1	0.7	7	5.0	8	5.7	NS
	>R1000	2	1.4	5	3.6	7	5.0	NS
Mother's working status	Working full time	234	29.3	102	12.8	336	42.0	0.000
	Unemployed	110	13.8	154	19.3	264	33.0	NS
	No mother	49	6.1	80	10.0	129	16.1	NS
	Working part time	27	3.4	25	3.1	52	6.5	NS
	Retired	14	1.8	5	0.6	19	2.4	NS
Father's working status	No father	127	15.9	183	22.9	310	38.8	0.000
	Working full time	217	27.1	66	35.4	283	35.9	0.010
	Unemployed	35	4.4	76	9.5	111	13.9	NS
	Retired	33	4.1	28	3.5	61	7.6	NS
	Working part time	22	2.8	13	1.6	35	4.4	NS

[#]Chi-squared test with $p < 0.05$ considered significant

Of the 366 participants who were on financial aid, 72.1% received financial assistance from NSFAS, 13.9% had other sponsors and the remainder (13.7%) were funded by means of government bursaries. From table 4.6, it was evident that nearly two thirds (60.0%) of the study sample were looking for a part time job, of which 10.4% had a part time job. Of those who had a part-time job, more did not receive financial aid (6.5%) than those who did (3.9%). Of the 83 participants who held a part time job, 25.3% worked as sales persons, 24.1% held a UKZN-related job, 10.8 % worked as waitrons and 6.0% as tutors. Other jobs included bartending, coaching, bookselling, data capturing, working as a DJ, driving, graphic designing and working as a photographer. Two participants were self-employed and three participants held two or more part-time jobs.

As far as allowance is concerned, 76.6% received an allowance of which 69.4% were not on financial aid while 30.6% were. Participants receiving R500-1000 was more common (22.9%) followed by a range of R100-500 (22.6%) and 16.0% receiving more than R2500. Significantly more participants not on financial aid (14.0%) were found to be receiving an allowance of R500-1000, when compared to those receiving financial aid (8.9%). Significantly more non-financial aid participants (12.2%) received an allowance of R100-500, when compared to those on financial aid (10.4%). Of the 607 participants who did receive an additional allowance, 62.8% received money from parents, 6.6% from siblings, 5.4% had part time jobs, 4.6% received money from guardians, 2.6% from grandparents and the remainder received their allowance from a combination of the above mentioned. 20.5% of the 210 participants who were in a relationship, received an income from their partners. 11.0% of the latter category were on financial aid. Of the 4.4% (n=35) participants who received government grants, the majority 68.6% received child support grants, followed by 14.3% received disability grants, 11.4% received foster child care grants and 5.7% received child dependency grants. Of the participants who did receive social grants 71.2% were on financial aid while 28.6% were not. Participants on financial aid (42.9%) received significantly more child support grants compared to those who did not receive financial aid (25.7%).

When the participants were asked if they were experiencing any trouble in obtaining bursaries/funding for their studies, 37.2% indicated that they have experienced difficulties. Of the latter sub-group 80.9% were not on financial aid while 19.1% were recipients of financial aid. Participants not receiving financial aid (30.1%) reported to significantly experiencing more difficulty in obtaining bursaries/loans/financial assistance than those on financial aid (7.1%). Of the main reasons given for facing difficulties in obtaining bursaries/loans/financial aid, 18.1% of participants stated that they applied but never received a response. In addition, 17.8% had poor academic records, 13.4% applied but were rejected, 9.7% were unable to find bursaries in their respective field of study, 9.4% had outstanding fees resulting in their marks being withheld, 8.4% were not eligible according to the criteria stipulated for receiving a bursary/loan/financial aid and 3.7% stated that the bursaries were available for those of particular race groups. Other reasons such as not being unaware of how to apply, extended duration of study, exhausted funds, mature age, not being South African citizens, parents having a high annual income and parents working for the government were also stated.

Of the 17.6% (n=141) participants who admitted to have been assisting their families/friends/partner financially, 87.2% were on financial aid while 12.8% were not. The majority of participants (36.2%) provided financial assistance of R100-200, followed by 21.3% handing out R200-400 and 15.6% handing out R400-600. More participants on financial aid (34.0%) were providing financial assistance of R100-200 of their bursary/loan/income compared to those not on financial aid (2.1%). Significantly more financial aid participants (19.9%) were found to be handing out R200-400 of their bursary/loan/income compared to those not on financial aid (1.4%).

When questioned about the participants' parents working status 42.0% of mothers were working full time, 33.0% of the mothers were unemployed and 6.5% were working part time. Significantly more mothers' of non-recipients of financial aid participants (29.3%) were working full time compared to financial aid participants (12.8%). The participants' reported that 35.9% of fathers were working full time, 13.9% of fathers were unemployed and 4.3% were working part time. Significantly fewer fathers of participants receiving financial aid (27.1%) were working full time compared to non-recipients of financial aid participants (35.4%). The majority of financial aid participants (22.9%) did not have a father compared to those not on financial aid (15.9%).

The table 4.7 reported the mean monthly expenses of study sample in Rand.

Table 4.7: Mean monthly expenses(R) in accordance to participants on financial aid and those not (N=800)

Expenses	N		Overall	Mean (R)			SD			p value [#]
	FA*	NFA*		FA*	NFA*	Overall	FA*	NFA*	Overall	
Rent	108	145	253	1885.56	1788.48	1829.92	564.78	617.07	596.10	NS
Food	335	384	719	569.37	499.06	531.82	275.16	342.01	314.40	0.003
Travelling	94	177	271	264.57	554.66	454.04	304.27	692.24	602.82	0.000
Clothing	227	224	451	356.43	411.16	383.61	269.38	481.97	390.27	NS
Alcohol	42	90	132	310.00	363.67	346.59	299.50	337.22	325.52	NS
Social Events	104	188	292	230.66	282.87	264.28	253.95	283.59	274.11	NS
Other Expenses	7	18	25	200.00	240.56	229.20	111.80	219.48	193.88	NS
Toiletries	291	296	587	162.77	182.16	172.55	91.18	162.29	132.16	NS
Study related costs	278	273	551	55.59	61.67	58.60	44.52	54.10	49.55	NS

*NFA: non-financial aid; FA: financial aid

[#]Chi-squared test with $p < 0.05$ considered significant

Overall, the study sample spent the majority of their money on rent (R1829.92), followed by food (R531.82), travelling costs (R454.04), clothing (R383.61), alcohol (R346.59), social events (R264.28) and other expenses (R229.20). Toiletries, and study related costs such as printing credits, represented the lowest expense at R172.55 and R58.60 respectively. Other expenses included cigarettes, gym fees, hair, sports equipment and cannabis used as a recreational drug. Although very few, six participants were found to have been spending a minimum and maximum amount of R100 and R1000 on cannabis. Participants on financial aid spent significantly more on food compared to those not on financial aid. It was statistically significant that non-recipients of financial aid spent more on travelling expenses compared to participants on financial aid.

4.5 Dietary diversity

An overview of participants' dietary diversity was depicted in Table 4.8 in accordance with the non-quantified food frequency questionnaire that was administered to the study sample.

Table 4.8: Participants' dietary diversity reported as actual number of response

FOOD ITEM	> Once/day		Once/ day		Every 2 nd day		2 – 3 times/week		Once/week		Rarely		Never		P value [#]
	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	
MILK															
Fresh milk	48	89	66	95	15	19	39	46	29	35	133	124	36	25	0.018
	137		161		34		85		64		257		62		
UHT/life milk	5	12	16	24	6	5	23	38	11	16	205	196	100	143	NS
	17		40		11		61		27		401		243		
Powdered milk	15	17	11	11	4	6	20	16	13	8	193	221	110	165	NS
	22		22		10		36		21		414		275		
DAIRY PRODUCTS DAIRY REPLACEMENTS															
Cheese	16	11	24	33	29	59	38	67	38	67	147	122	53	45	0.000
	27		57		88		105		105		269		98		
Maas, yogurt	5	6	9	24	19	32	51	82	91	78	156	172	35	40	0.031
	11		33		51		133		169		328		75		
Coffee creamer	32	16	39	36	10	15	32	41	30	28	140	173	83	125	0.031
	48		75		25		73		58		313		208		
Ice cream	0	1	1	1	10	17	8	24	22	48	275	304	50	39	0.007
	1		2		27		32		70		579		89		

*NFA: non-financial aid; FA: financial aid

[#]Chi-squared test with $p < 0.05$ considered significant

Table 4.8(continue): Participants’ dietary diversity reported as actual number of response

FOOD ITEM	> Once/day		Once/ day		Every 2 nd day		2 – 3 times/week		Once/week		Rarely		Never		p value [#]
	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	
STARCH															
Bread	131	168	90	125	33	50	67	57	19	13	21	19	5	2	NS
	299		215		83		124		32		40		7		
Rice, mealie rice, samp	52	42	112	118	53	83	97	100	20	47	28	35	4	9	0.015
	94		230		136		197		67		63		13		
Breakfast cereals	27	33	145	176	25	40	44	48	28	20	67	88	30	29	NS
	60		321		65		92		48		155		59		
Potato	13	17	32	32	40	58	100	141	56	71	100	36	25	19	NS
	30		64		98		241		127		136		44		
Porridge	33	31	68	76	35	39	79	79	45	49	78	111	28	49	NS
	64		144		74		158		94		189		77		
Pasta	7	8	15	12	42	49	66	121	59	115	135	108	42	21	0.000
	15		27		91		187		174		243		63		
PLANT PROTEIN															
Legumes	5	6	16	12	18	43	83	86	86	99	117	123	41	65	NS
	11		28		61		169		185		240		106		
Peanut butter	33	30	31	51	37	41	40	60	25	49	85	103	115	100	0.029
	63		82		78		100		74		188		215		
MEAT AND MEAT PRODUCTS															
Chicken	12	7	16	23	81	118	140	170	82	73	25	27	10	16	NS
	19		39		199		310		155		52		26		
Eggs	14	11	40	35	133	145	91	104	42	71	30	50	16	18	NS
	25		75		278		195		113		80		34		

*NFA: non-financial aid; FA: financial aid

[#]Chi-squared test with $p < 0.05$ considered significant

Table 4.8(continue): Participants' dietary diversity reported as actual number of response

FOOD ITEM	> Once/day		Once/ day		Every 2 nd day		2 – 3 times/week		Once/week		Rarely		Never		P value [#]
	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	
Red meat	3	2	11	21	56	86	90	139	90	97	92	66	24	23	0.004
	5		32		142		229		187		158		47		
Processed meats	5	8	25	19	48	60	104	103	48	73	105	129	31	42	NS
	13		44		108		207		121		234		73		
Canned fish	1	0	1	5	19	18	56	73	122	115	100	137	67	86	NS
	1		6		37		129		237		237		153		
Organ meat	0	1	3	5	10	14	35	41	49	64	177	196	92	113	NS
	1		8		24		76		113		373		205		
Frozen fish	0	0	0	1	1	3	1	11	17	39	187	214	160	166	0.009
	0		1		4		12		56		401		326		
Fresh fish	1	1	1	0	4	7	7	23	17	22	189	233	147	148	NS
	2		1		11		30		39		422		295		
FRUITS AND VEGETABLES															
Fresh vegetables	14	16	36	60	46	59	124	155	63	66	72	66	11	12	NS
	30		96		105		279		129		138		23		
Frozen vegetables	9	10	49	68	47	68	112	119	50	59	69	76	30	34	NS
	19		117		115		231		109		145		64		
Fresh fruit	59	44	66	93	49	64	48	75	39	53	88	87	17	18	NS
	103		159		113		123		92		175		35		
Dried fruit	1	2	5	5	8	16	9	14	14	15	140	177	189	205	NS
	3		10		24		23		29		317		394		
FAT															
Fats (oil, margarine)	169	166	100	144	38	40	35	43	8	16	13	19	3	6	NS
	335		244		78		78		24		32		9		

*NFA: non-financial aid; FA: financial aid

[#]Chi-squared test with p < 0.05 considered significant

Table 4.8(continue): Participants' dietary diversity reported as actual number of response

	> Once/day		Once/ day		Every 2 nd day		2 – 3 times/week		Once/week		Rarely		Never		P value [#]
FOOD ITEM	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	
HIGH FAT HIGH CARBOHYDRATE FOODS															
Salty snacks	9	7	11	23	49	66	108	139	79	85	98	93	12	21	NS
	16		34		115		247		164		191		33		
Baked snacks eg. muffins	4	5	10	4	25	32	40	60	60	73	190	224	37	36	NS
	9		14		57		100		133		414		73		
Chocolate	3	7	7	10	12	34	26	40	71	91	216	215	31	37	0.044
	10		17		46		66		162		431		68		
Sweets	86	102	46	72	51	68	75	62	39	44	59	69	10	17	NS
	188		118		119		137		83		128		27		
Fried snacks eg. doughnuts	6	3	10	11	17	33	40	59	52	59	178	216	63	53	NS
	9		21		50		99		111		394		116		
Biscuits	5	7	7	11	15	25	33	53	48	62	205	237	53	39	NS
	12		18		40		86		110		442		92		
Energy bars	2	2	5	9	11	19	24	31	46	56	217	256	61	61	NS
	4		14		30		55		102		473		122		
ALCOHOL															
Beer & ciders	1	0	0	1	2	4	7	25	30	50	62	95	264	259	0.004
	1		1		6		32		80		157		523		
Spirits	0	0	1	2	2	3	5	17	24	46	60	105	274	161	0.001
	0		3		5		22		70		165		535		
Wine	1	0	1	3	2	3	3	11	28	43	90	121	241	253	NS
	1		4		5		14		71		211		494		
Cocktails	2	3	0	0	1	2	1	6	4	14	68	115	290	294	0.007
	5		0		3		7		18		183		584		

*NFA: non-financial aid; FA: financial aid

[#]Chi-squared test with $p < 0.05$ considered significant

Table 4.8(continue): Participants' dietary diversity reported as actual number of response

	> Once/day		Once/ day		Every 2 nd day		2 – 3 times/week		Once/week		Rarely		Never		P value [#]
FOOD ITEM	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	
NON-ALCOHOLIC BEVERAGES															
Coffee & tea	120	158	118	139	52	51	34	34	17	11	12	33	13	8	0.036
	278		257		103		68		28		45		21		
Fruit juice	46	67	44	61	48	52	54	60	41	53	106	114	27	27	NS
	113		105		100		114		94		220		54		
Fizzy drinks	15	31	25	45	36	62	71	72	68	72	112	119	39	33	0.038
	46		70		98		143		140		231		72		
FAST FOODS															
Potato chips (French fries)	2	7	4	13	37	42	94	109	92	127	127	126	10	10	NS
	9		17		79		203		219		253		20		
Pies & sausage rolls	2	0	3	6	16	21	65	71	98	115	155	190	27	31	NS
	2		9		37		136		213		345		58		
Honchos	1	0	0	6	7	14	25	30	113	148	195	181	25	55	0.002
	1		6		21		55		261		376		80		
KFC, chicken licken	0	0	1	1	6	7	11	15	93	121	227	253	28	37	NS
	0		2		13		26		214		480		65		
Pizza	1	4	0	3	10	14	19	19	49	86	248	270	39	38	NS
	5		3		24		38		135		518		77		
Hot dogs	2	0	0	1	10	13	28	27	39	73	234	259	53	61	NS
	2		1		23		55		112		493		114		
Burgers (non-branded)	0	0	1	3	6	9	9	25	30	61	281	290	39	46	0.012
	0		4		15		34		91		571		85		
Karanichas & bunny chows	0	0	0	2	6	10	11	24	46	39	214	254	89	105	NS
	0		2		16		35		85		468		194		

*NFA: non-financial aid; FA: financial aid

[#]Chi-squared test with p < 0.05 considered significant

Table 4.8(continue): Participants' dietary diversity reported as actual number of response

FOOD ITEM	> Once/day		Once/ day		Every 2 nd day		2 – 3 times/week		Once/week		Rarely		Never		p value [#]
	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	FA*	NFA*	
McDonalds, Steers, Spur	0	0	1	2	1	4	5	16	10	36	308	328	41	48	0.03
	0		3		5		21		46		636		89		
Nando's	0	0	0	2	3	5	5	9	13	31	286	324	59	63	NS
	0		2		8		14		44		610		122		

*NFA: non-financial aid; FA: financial aid

[#]Chi-squared test with $p < 0.05$ considered significant

From Table 4.8, it was evident that 60.1% (n=481) of participants consumed fresh milk on a weekly basis with 37.3% (n=298) of the study sample having fresh milk at least once a day compared to any other milk or milk products. In addition, non-recipients of financial aid (42.4%) had a higher daily mean frequency consumption compared to those on financial aid (31.1%). Apart from fresh milk, coffee creamer was consumed the most among the dairy products and dairy replacements on a daily basis. Also, it would seem that the daily mean frequency of consumption of coffee creamer was significantly higher among recipients of financial aid (19.4%) when compared to those not on financial aid (12.0%). The least consumed milk and milk product was ice cream (16.5%).

As far as starch was concerned, it was found that this group of foods were most often consumed. Bread was consumed by 94.1% (n=753) of participants on a weekly basis, usually consumed by 64.3% (n=514) participants at least once a day. This was followed by rice, mealie rice and samp which was eaten by 90.5% (n=724) of participants on a weekly basis, mostly consumed at least once a day by 40.5% (n=324). Significantly more participants who were on financial aid (44.8%) consumed rice, mealie rice and samp daily when compared to those not on financial aid (36.9%). Breakfast cereals was consumed by 73.3% (n=586) on a weekly basis and eaten by 47.6% (n=381) at least once a day. Porridge was consumed by 31.5% (n=252) participants on a weekly basis and consumed by 26.0% (n=208) least once a day. The least consumed starch was pasta which was most often consumed two to three times a week by 30.1 (n=187) participants. There were significantly more participants who were on financial aid (6.0%) consumed pasta on a daily basis than those not on financial aid (4.6%).

When it came to protein intake, on a weekly basis participants consumed chicken (90.3%) the most, followed by eggs (85.8%), red meat (74.4%), processed meat (61.6%), legumes (56.8%), canned fish (51.3%) and peanut butter (49.6%). It was found that when it came to daily consumption of protein containing foods, peanut butter was consumed by 18.1% (n=145) participants, with the mean frequency of consumption being higher amongst non-recipients of financial aid (18.7%) compared to those on financial aid (17.5%). Eggs was consumed by 12.5% (n=100) of the study sample at least once a day, the majority being on financial aid (14.8%). Chicken was consumed at least once a day by 7.3% (n=58) of participants, the majority being on financial aid (7.7%). 7.1% (n=57) of the study sample consumed processed meat at least once a day, with the majority being on financial aid (8.2%). Legumes was consumed by 4.9% (n=39) of participants daily, mostly amongst participants on

financial aid (5.7%). Red meat was consumed by 4.6% (n=37) of participants with the majority being non-recipients of financial aid (5.3%). The least consumed protein sources on a weekly basis were frozen fish (9.1%) and fresh fish (7.00%).

Of the study sample, 79.9% (n=639) consumed fresh vegetables and 73.9% (n=591) consumed frozen vegetables on a weekly basis. Fresh vegetables was consumed by 15.8% (n=126) with the highest daily consumption amongst non-recipients of financial aid (17.5%). Frozen vegetables was consumed by 17.0% (n=136) of participants at least once a day, with the highest frequency of consumption amongst non-recipients of financial aid (18.0%). Fresh fruits were also consumed by 73.8% (n=590) participants on a weekly basis. 32.8% (n=262) of the study sample consumed fresh fruits at least once a day, with the highest frequency of consumption amongst non-recipients of financial aid (31.6%).

Fats in any form were commonly consumed by 94.9% (n = 759) of the study sample on a weekly basis of which, 72.4% (n = 579) consumed them at least once a day. It was found that salty snacks, (72.0%) were more often consumed during the week, followed by muffins, cupcakes and scones (39.1%), followed by chocolate (37.6%), vetkoek, samoosas and doughnut (36.3%) and cookies, shortbread and crunchies (33.3%) consumed on a weekly basis. Sweets was consumed by 38.3% (n=306) daily with the highest frequency of consumption amongst non-recipients of financial aid (40.1%). Chocolate was significantly more often consumed on a weekly basis by non-recipients of financial aid participants (22.8%) when compared to those on financial aid at 14.9%.

It was found that 38.3% (n=306) participants consumed alcohol. The most popular alcoholic drinks were beers and ciders (15.0%) consumed on a weekly basis followed by spirits (12.5%) and wine (11.9%). The least consumed were cocktails (4.1%). Beers and ciders were significantly more often consumed by non-recipients of financial aid (21.9%) when compared to those on financial aid (12.8%). Spirits were also consumed significantly more often by participants who were not on financial aid (21.6%) when compared to those who are on financial aid (11.5%). Significantly more participants who were not on financial aid (17.5%) consumed cocktails more often than those on financial aid (9.5%).

Of the non-alcoholic beverages assessed, coffee and tea was consumed at least once a day by 66.9% (n=535) of participants, significantly more participants who were not on financial aid

(37.1%) compared to those on financial aid (29.8%). Fruit juice was the second more popular drink consumed daily by 27.3% (n=218), with the highest frequency of consumption amongst non-recipients of financial aid (29.5%). On a daily basis, fizzy drinks and flavoured drinks were the least consumed by 14.5% (n=116). Significantly more participants who were not on financial aid (17.5%) consumed fizzy drinks and flavoured drinks on a daily basis.

When it came to eating out, all the fast foods were most often consumed once a week. The fast foods consumed most often were fresh potato chips (65.9%), pies and sausage rolls (49.6%), honchos (43.0%), KFC (31.9%) and pizzas (25.6%). The least consumed fast foods were Nandos (8.5%) and McDonalds/Steers/Spur (9.4%). Significantly, more participants who were not on financial aid consumed Honchos (47.4%), no name brand burgers (48.5%) and McDonalds/Steers/Spur (46.4%) than those not on financial aid.

4.6 Factors influencing food security

In the Table 4.9, the factors that influence participants' food insecurity status in relation to receiving financial aid or not was reported.

Table 4.9: Factors influencing the food security status of recipients and non-recipients of financial aid (N=800)

		Non-financial aid n = 434		Financial aid n = 366		Total N = 800		p value #
		N	%	n	%	n	%	
Awareness of UKZN food vouchers	No	397	49.6	308	38.5	705	88.1	NS
	Yes	37	4.6	58	7.3	95	11.9	NS
Used food vouchers	No	28	29.5	49	51.6	77	81.1	0.001
	Yes	8	8.4	10	10.5	18	19.0	NS
Price influencing food purchases	Yes	407	50.9	360	45.0	767	95.9	0.001
	No	33	4.1	0	0	33	4.1	NS
Time for food preparation	Yes	314	39.3	269	33.7	583	72.9	NS
	No	120	15.0	97	12.1	217	27.1	NS

#Chi-squared test with $p < 0.05$ considered significant

Table 4.9 (continue): Factors influencing the food security status of recipients and non-recipients of financial aid

		Non-financial aid n = 434		Financial aid n = 366		Total N = 800		p value #
		N	%	n	%	n	%	
Facility for food preparation	Yes	406	50.8	325	40.6	731	91.4	0.017
	No	28	3.5	41	5.1	69	8.6	NS
Missed lectures	Laziness & apathy	155	19.4	115	14.4	270	33.8	NS
	Feelings of hopelessness, laziness & apathy	69	8.6	57	7.1	126	15.8	NS
	Hunger, fatigue, laziness & apathy	59	7.4	55	14.4	114	14.3	NS
	Fatigue	66	1.0	47	1.4	113	14.1	NS
	Hunger, apathy & laziness	48	6.0	54	6.8	102	12.8	NS
	Laziness	12	1.5	11	1.4	23	2.9	NS
	Never missed lectures	8	8.3	11	5.9	19	2.4	NS
	Feelings of hopelessness	7	0.9	11	1.4	18	2.3	NS
	Hunger	8	1.0	4	0.5	12	1.5	NS
	Apathy	2	0.3	1	0.1	3	0.4	NS
Difficulty with concentration	Yes	275	34.4	251	31.4	526	65.8	NS
	No	159	19.9	115	14.4	274	34.3	NS
Main reason for hunger	Lack of time for preparation/purchase	252	31.5	167	20.9	419	52.4	0.000
	Lack of money	156	19.5	191	23.9	347	43.4	NS
	Too lazy to prepare food	26	3.3	7	0.9	33	4.1	NS
	Fasting for religious reasons	0	0	1	0.1	1	0.1	NS
Time most hungry during semester	End of semester	239	29.9	224	28.0	463	57.9	NS
	Beginning of semester	76	9.5	79	9.9	155	19.4	NS
	Half way across semester	52	6.5	46	5.8	98	12.3	NS
	Not applicable	67	8.4	17	2.1	84	10.5	NS
Time of the day when most hungry	Mid-day	207	25.9	171	21.3	378	47.3	NS
	Mid-afternoon	144	18.0	127	15.9	271	33.9	NS
	Morning	42	5.3	34	4.3	76	9.5	NS
	Evening	33	4.1	28	3.5	61	7.6	NS
	Bedtime	8	1.0	6	0.8	14	1.8	NS

[#]Chi-squared test with $p < 0.05$ considered significant

Table 4.9 (continue): Factors influencing the food security status of recipients and non-recipients of financial aid

		Non-financial aid n = 434		Financial aid n = 366		Total N = 800		p value #
		N	%	n	%	n	%	
Losing weight	No	358	44.8	272	34.0	630	78.8	0.010
	Yes	76	9.5	94	11.8	170	21.3	NS
Frequency of weight lost	Twice a year	39	22.9	42	24.7	81	47.7	NS
	Three times a year	13	7.7	33	19.4	46	27.1	0.000
	Twice every three months	24	14.1	19	11.2	43	25.3	NS
Lack of dietary variety	Yes	291	36.4	325	40.6	616	77.0	NS
	No	143	17.9	41	5.1	184	23.0	0.000
Frequency of lack of food	Every month end	172	27.9	62	10.1	334	54.2	0.000
	Almost everyday	38	6.2	64	10.4	102	16.6	NS
	Every 2 months	24	3.9	38	6.2	62	10.1	NS
	Every day	25	4.1	24	3.9	49	7.6	NS
	Every week	18	2.9	29	4.7	47	7.6	NS
	Rarely	12	2.0	10	1.6	22	3.7	NS

[#]Chi-squared test with $p < 0.05$ considered significant

From Table 4.9, it became evident that 11.9% (n=95) of participants were aware of UKZN food vouchers, of which 19.0% (n=18) admitted to have made use for this service. Of the 77 students who did not make use food vouchers, there was significantly more non-recipients of financial aid students (51.6%) when compared to those on financial aid (29.5%). When it came to food prices 95.9% (n=767) students agreed that food prices did influence their purchases. Of the latter sub-sample, 45.0% (n=345) were on financial aid. Significantly more students who were non-recipients of financial aid (50.9%) reported that food prices influence their purchases when compared to those on financial aid (45.0%). 72.9% of students had enough time to prepare and cook meals, while 91.4% stated that they had the necessary facilities to prepare food. There were significantly more participants who were not on financial aid (50.8%) stated that they had the facilities available to prepare food compared to participants on financial aid (40.6%).

As far as the emotional wellbeing of participants were concerned, 42.6% (n=341) faced hunger with its associated symptoms of fatigue and apathy. Of this sub-sample, 53.1%

(n=81) were not on financial aid while 46.9% (n=160) were on financial aid. Over half (55.0%) participants were experiencing symptoms of depression, laziness, lack of interest and stress. Of these, 44.3% (n=195) of participants were on financial aid while 55.7% (n=245) were not. It was found that 65.8% (n=526) of participants struggled to concentrate in class due to hunger, of which 52.3% (n=275) were not financial aid while 47.7% (n=251) were on financial aid. Participants reported that the main reason for being hungry was a lack of time for purchase/preparation of food (52.4%), with significantly more non-recipients of financial aid participants (31.5%) when compared to those on financial aid (20.9%) reporting this phenomenon. 43.4% (n=347) of participants indicated that they did not have enough money to purchase food, of which 55.0% (n=191) were on financial aid. It was found that 57.9% (n=463) of participants were hungriest at the end of the semester with a higher prevalence of 28.0% (n=224) among participants on financial aid. The time of day participants reported to be the hungriest was mid-afternoon (33.9%) and mid-day (47.3%).

Of the 333 participants who lived in student residence, 75.1% (n=250) reported that they had a secure place to store their food while 24.9% (n=83) stated the opposite. Of the participants who live in student residence, 73.0% (n=243) admitted to have had their food stolen. When questioned whether participants felt that they have lost weight due to a lack of food, 21.3% (n=170) reported that they did, of which 55.3% were on financial aid. A significant finding that among participants who did not report weight loss as a result of food insecurity, 44.8% were non-recipients of financial aid when compared to 34.0% being on financial aid. The highest frequency of reported weight loss was twice a year among 47.7% (n=81) participants followed by three times a year by 27.1% (n=46) participants. There were significantly more participants on financial aid (19.4%) who reported weight loss three times a year when compared to those not on financial aid (7.7%). Of the study sample, 77.0% (n=616) participants stated that they could not eat a variety of meal due to the lack of resources. Of the latter group, 52.8% (n=325) were recipients of financial aid. The majority of participants (54.2%) reported that at every month end, there was an increase in their dietary lack of variety in foods. Significantly more non-recipients of financial aid participants (27.9%) lacked variety at month end when compared to those on financial aid (10.1%).

4.7 Prevalence of food security

In Table 4.10, the HFIAS classification of participants is reported in accordance to whether they receive financial aid or not.

Table 4.10: HFIAS* classification of study sample (N=800)

HFIAS	Never			Rarely			Sometimes			Often			p value [#]
	FA†	NFA†	T	FA†	NFA†	T	FA†	NFA†	T	FA†	NFA†	T	
1	29 7.9%	119 27.4%	148 18.5%	58 15.8%	90 20.7%	148 18.5%	174 47.5%	128 29.5%	302 37.8%	105 28.7%	97 22.4%	202 25.3%	0.000
2	28 7.7%	92 21.2%	120 15.0%	67 18.3%	97 22.4%	164 20.5%	163 44.5%	157 36.2%	320 40.0%	108 29.5%	88 20.3%	196 24.5%	0.000
3	22 6.0%	103 23.7%	125 15.6%	85 23.2%	94 21.7%	179 22.4%	153 41.8%	152 35.0%	305 38.1%	106 29.0%	85 19.6%	191 23.9%	0.000
4	42 11.5%	127 29.3%	169 21.1%	84 23.0%	106 24.4%	190 23.8%	127 34.7%	114 26.3%	241 30.1%	113 30.9%	87 20.0%	200 25.0%	0.000
5	69 18.9%	166 38.2%	235 29.4%	95 26.0%	110 25.3%	205 25.6%	138 37.7%	108 24.9%	246 30.8%	64 17.5%	50 11.5%	114 14.3%	0.000
6	80 21.9%	184 42.4%	264 33.0%	101 27.6%	103 23.7%	204 25.5%	127 34.7%	95 21.9%	222 27.8%	58 15.8%	52 12.0%	110 13.8%	0.000
7	109 29.8%	215 49.5%	324 40.5%	111 30.3%	106 24.4%	217 27.1%	111 30.3%	83 19.1%	194 24.3%	35 9.6%	30 6.9%	65 8.1%	0.000
8	150 41.0%	257 59.2%	407 50.9%	92 25.1%	96 22.1%	188 23.5%	100 27.3%	62 14.3%	162 20.3%	24 6.6%	19 4.4%	43 5.4%	0.000
9	202 55.2%	315 72.6%	517 64.6%	82 22.4%	73 16.8%	155 19.4%	69 18.9%	35 8.1%	104 13.0%	13 3.6%	11 2.5%	24 3.0%	0.000

*HFIAS was adapted by changing 'household' to individual intake (See Chapter 3)

† NFA: non-financial aid; ‡ FA: financial aid ; T = total number of non- financial aid and financial aid students

[#]Chi-squared test with $p < 0.05$ considered significant

From the results reported in Table 4.8, it was evident that 63.0% (n=504) of students stated that they worried if they were going to have enough food more than three times per month. There was statistically significant difference for this variable among those on financial aid (76.2%) when compared to those not on financial aid (51.8%). In the last month, 85.0% (n=680) of participants reported that they were not able to eat the foods they preferred. This finding was statistically significant when comparing those on financial aid (92.3%) to those not receiving financial aid (78.8%). 84.3% (n=674) reported to consume a limited variety of foods. For this variable, there was a significant difference between those on financial aid (94.0%) when compared to those not on financial aid (76.3%). In the last 30 days, 78.9% (n=631) of the study sample ate food that they did not want. Recipients of financial aid (88.5%) were significantly more likely to report this than participants who were not on financial aid participants (70.7%).

70.6% (n=565) of the study sample reported to have been eating smaller meals with financial aid participants (81.1%) being significantly more likely to report the latter than those not on financial aid (61.8%). In the last month, 67.0% (n=536) of the study sample ate fewer meals of which 78.1% were on financial aid participants while 57.6% were not recipients of financial aid. The three most severe indicators of food insecurity namely running out of food, going to bed hungry or going a whole day without food were experienced by the study sample. A total of 59.5% (n=476) of participants reported that there was no food. Significantly more participants on financial aid (70.2%) reported this when compared to those who were not on financial aid (50.5%). It was found that 49.1% (n=393) of the study sample went to bed hungry with statistically more being on financial aid (59.0%) when compared to those not on financial aid (40.8%). In addition, 35.4% (n=283) went without food for a whole day and night with significantly more participants being on financial aid (44.8%) when compared to those who were not (27.4%).

In Table 4.11, the food security status of the study sample is reported according to the four HFIAS classifications between recipients and non-recipients of financial aid.

Table 4.11: Food security status of recipients and non-recipients of financial aid (N= 800).

	Food secure		Mildly food insecure		Moderately food insecure		Severely food insecure		p value[#]
	n	%	n	%	n	%	n	%	
FA* (n=366)	57	15.6	128	35.0	124	33.9	57	15.6	0.000
NFA* (n=434)	164	37.8	125	28.8	102	23.5	43	9.9	
Overall (N=800)	221	27.6	253	31.6	226	28.3	100	12.5	

[#]Chi-squared test with $p < 0.05$ considered significant

*NFA: Non-recipients of financial aid; FA: recipients of financial aid

From Table 4.11, it can be observed that 27.6% (n=221) of participants were food secure while 72.4% (n=579) were facing food insecurity, of which 31.6% (n=253) were mildly food insecure, 28.3% (n=226) were moderately food insecure and 12.5% (n=100) were severely food insecure. Among those facing food insecurity, 53.4% (n=309) were on financial aid and 46.6% (n=270) were not. There was a statistically significant difference regarding the fact that more participants on financial aid were facing mild food insecurity, moderate food insecurity and severe food insecurity compared to those not on financial aid.

4.8 Coping Strategies adopted when faced with food insecurity

In Table 4.12, the coping strategies adopted by participants when faced with food insecurity, were reported in relation to whether they were recipients of financial aid or not.

Table 4.12: Coping strategies adopted by participants in relation to when participants face food insecurity

Coping strategies stated	Non-financial aid		Financial aid		Total	
	n	%	n	%	n	%
Asking/borrowing money for food	285	65.7	247	67.5	532	66.5
Asking/borrowing food	31	30.2	145	39.6	276	34.5
Visit friends/relatives at meal times	8	1.8	4	1.1	12	1.5
Always have food	51	11.8	11	3.0	62	7.8
Sexual favours for money	2	0.5	0	0	2	0.3
Sleep	1	0.2	0	0	1	0.1
Starve and drinking water	10	2.3	3	0.8	13	1.6
Steal food	35	8.1	48	13.1	83	10.4
Steal money and other items to purchase food	15	3.5	22	6.0	37	4.6
Selling assets/possessions to purchase food	65	15.0	89	23.5	154	19.3

From Table 4.12, it is evident that 66.5% (n=532) of participants asked for or borrowed money from parents/friends/partner/church members/guardians, followed by 34.5% (n=276) participants who borrowed food from friends/partner/church members. In addition, it was found that 10.4% (n=83) of participants stole food and 4.6% (n=37) stole money and other items to sell in order to purchase food. Although very few, two participants (0.8%) reported to have offered sexual favours to acquaintances and friends in order to get money to buy food. It was also reported that 1.6% (n=13) starved, drank water and slept not having anything to eat. In order to buy food, 19.3% (n=154) participants admitted to selling assets and possessions of which 57.8% (n=89) were on financial aid. Of the 9.8% (n=78) participants who sold their belongings to buy food, majority sold text books (64.1%), followed by electronic equipment (23.1%) which consisted of predominantly laptops, calculators, pen drives, speakers and cell phones. Other items sold included tests and past practicals, jewellery, clothes, shoes and furniture.

Table 4.13 reports the frequency of coping strategies adopted by participants when faced with food insecurity in the previous week in relation to whether they are recipients of financial aid or not.

Table 4.13: Coping strategy index of study sample

	Daily			Sometimes (3-6 times/week)			Rarely (<1-2 /week)			Never (0/week)			p value [#]
	FA*	NFA*	T	FA*	NFA*	T	FA*	NFA*	T	FA*	NFA*	T	
DIETARY CHANGE													
Rely on less preferred and less expensive foods	178 48.6%	146 33.6%	324 40.5%	125 34.2%	149 34.3%	274 34.3%	53 14.5%	91 21.0%	144 18.0%	10 2.7%	48 11.1%	58 7.30%	0.000
RATIONING STRATEGIES													
Limit portion size at mealtimes	35 9.6%	35 8.1%	70 8.8%	132 36.1%	96 22.1%	228 28.5%	114 31.1%	132 30.4%	246 32.0%	85 23.2%	171 39.4%	256 32.0%	0.000
Reduce number of daily meals	39 10.7%	34 7.8%	73 9.1%	128 35.0%	108 24.9%	236 29.5%	114 31.1%	106 24.4%	220 27.5%	85 23.2%	186 42.9%	271 33.9%	0.000
Go without food for days	2 0.5%	8 1.8%	10 1.3%	47 12.8%	30 6.9%	77 9.6%	80 21.9%	83 19.1%	163 20.4%	237 64.8%	313 72.1%	550 68.8%	0.007
INCREASING SHORT-TERM FOOD AVAILABILITY													
Borrow food, or relied on help from a friend or relative	12 3.3%	16 3.7%	28 3.5%	144 39.3%	100 23.0%	244 30.5%	114 31.1%	136 31.1%	250 31.3%	96 26.25	182 41.9%	278 34.8%	0.000
Purchase food on credit	2 0.5%	8 1.8%	10 1.3%	18 4.9%	14 3.2%	32 7.4%	25 6.8%	34 7.8%	59 7.4%	321 87.7%	378 87.1%	699 87.4%	NS
Sell personal belongings to obtain money to purchase food	1	6	7	27	26	53	44	27	71	294	395	669	0.008
	0.3%	1.4%	0.9%	7.4%	7.1%	8.9%	12.0%	6.2%	8.9%	80.3%	91.0%	87.4%	

*NFA: non-financial aid; FA: financial aid; T: total number of financial aid and non-financial aid students

[#]Chi-squared test with $p < 0.05$ considered significant

Table 4.13(continue): Coping strategy index of study sample

	Daily			Sometimes (3-6 times/week)			Rarely (<1-2 /week)			Never (0/week)			p value[#]
	FA*	NFA*	N	FA*	NFA*	N	FA*	NFA*	N	FA*	NFA*	N	
Steal food	0 0%	3 0.7%	3 0.4%	39 10.7%	20 4.6%	59 7.4%	21 5.7%	15 3.5%	36 4.5%	306 83.6%	396 91.2%	702 87.8%	0.001
Steal other items and sell it to purchase food	0 0%	3 0.7%	3 0.4%	9 2.5%	6 1.4%	15 1.9%	17 4.6%	7 1.6%	24 3.0%	340 92.9%	418 96.3%	758 94.8%	0.018

*NFA: non-financial aid; FA: financial aid; T: total number of financial aid and non-financial aid students

[#]Chi-squared test with $p < 0.05$ considered significant

As far as making a dietary changes was concerned, 92.8% (n=742) of participants relied on less preferred food items and less expensive foods of which 40.5% (n=324) relied on this approach on a daily basis. Statistically there was a significant difference in that more participants on financial aid (97.3%) adopted a dietary changes when compared to non-recipients of financial aid (88.9%). Over a third (68.0%) of participants limited their portion sizes in the week prior to the survey, of which significantly more participants on financial aid (76.8%) compared those not on financial aid (60.6%) did so. It was found that 66.1% (n=529) reduced the number of meals consumed in the previous week, of which significantly more participants on financial aid (76.8%) compared those who were not on financial aid (57.1%) implemented this coping strategy. It was found that 31.2% (n=250) of the study sample indicated to have gone without food for entire days. Significantly more participants on financial aid (35.2%) compared to those not on financial aid (27.9%).

In order to increase their short-term food availability, 65.3% (n=522) of participants borrowed food or relied on help from friends/relatives, of which financial aid participants (73.8%) did so significantly more when compared to those who were not on financial aid (58.1%). It was found that 12.6% (n=101) of participants purchased food on credit. 12.6% (n=101) sold their personal belongings to obtain money for food purchases, of which significantly more participants on financial aid (19.7%) implemented this coping strategy when compared to those who were not on financial aid (9.0%). Just over one out of then (12.2%) of participants admitted to have stolen food in the past week, of which significantly more were on financial aid (16.4%) when compared to those not on financial aid (8.8%). Moreover, 5.3% (n=42) revealed to have stolen other items and sold it for food, of which significantly more were on financial aid (7.1%) compared to those who were non-recipients of not on financial aid (3.7%).

4.9 Conclusion

Of the 800 participants, 54.3% were non- recipients of financial aid, while 45.8% did receive financial aid. In the latter category, 72.1% were funded by NSFAS. The study sample consisted of 58.9% females and 41.1% males, the majority of participants being black. The majority of participants on financial aid were enrolled within the College of Agriculture, Engineering and Science, while there was a high prevalence of non-recipients of financial aid participants within the College of Law and Management and College of Humanities. The majority of those receiving financial aid resided at a student residence on campus, while more

non-recipients of financial aid lived off-campus accommodations or at home. Males who were not on financial aid had a higher mean in height, weight and BMI when compared to females and males on financial aid. Among financial aid participants, males were taller than females. However, females had a higher mean BMI than males. Among non-recipients of financial aid participants, males were taller and weighed more than females. However, females had a higher mean BMI compared to males.

Participants who were not on financial aid received a higher additional allowance ranging from R100 to R1000 when compared to those on financial aid. More financial aid student received government grants when compared to those who were not on financial aid, with the receipt of child support grants being more prevalent. Financial aid participants spent R200 to R400 of their bursaries/income in order to support partners/parents/friends compared to non-recipients of financial aid. In addition, participants on financial aid were spending more money on food and less on travelling when compared to non-recipients of financial aid. Participants consumed high energy, high fat and high salt foods and consume less fruits and vegetables. Participants who do not receive financial aid consumed more fruits and vegetables when compared to those on financial aid. According to the HFIAS that is used to determine food security status, financial aid recipients were more food insecure when compared to those who were not on financial aid. Participants who received financial aid adopted more coping strategies in order to deal with food insecurity. In addition, they had a higher prevalence in making dietary changes, rationing food and increasing short term food availability when compared to non-recipients of financial aid.

CHAPTER 5: DISCUSSION

5.1 Introduction

The study was conducted in order to investigate the prevalence of food insecurity and related coping strategies among undergraduate students registered at the University of KwaZulu-Natal, Pietermaritzburg campus. In order to achieve the study aim, five objectives were set. These included the following: (i) to determine and compare the prevalence of food insecurity; (ii) anthropometric status; (iii) dietary diversity; (iv) factors influencing food insecurity; and (v) coping strategies adopted when faced with food insecurity among undergraduate students receiving financial aid versus those not receiving financial aid.

5.2 BMI of recipients and non-recipients of financial aid

The SANHANES-1 study conducted on 25 532 individuals that were selected from the general South African population, reported that the mean weight of males and females aged 15 to 24 years as 59.6 kg and 63.0 kg respectively (Shisana *et al.* 2013). In the current study consisting of 800 participants, the mean weight of males and females was found to be 64.9 kg and 69.0 kg respectively. Hence, the mean weight of males and females in the current study, was higher than that reported by SANHANES-1. Shisana *et al.* (2013) reported that in their study sample, males (168.5cm) were found to be significantly taller than females (157.8cm). The current study also found that males (173cm) were significantly taller than females (160cm). The latter is therefore in agreement with that of SANHANES-1.

The South African Demographic and Health Survey (SADHS) reported that out of a sample of 13 089 individuals older than 15 years selected from general South African population, 12.2% of males and 5.6% of females were underweight (Puoane *et al.* 2002). By comparison, the SANHANES-1 study reported that 4.2% of females and 12.8% of males aged 15 to 24 years were found to be underweight (Shisana *et al.* 2013). A study conducted at the University of Stellenbosch among 360 first year female students reported a prevalence of underweight of 7.2% (Cillers *et al.* 2005). When compared to the above mentioned statistics, the prevalence of underweight was 5.1% among females and 4.3% among males in the current study. However, the SADHS and SANHANES-1 found a higher frequency of underweight amongst males when compared to females. This finding could be contributed to the small

sample size as well as the fact that the study participants represented a very select population whereas the SADHS and SANHANES-1 surveys were conducted on samples that were representative of the general South African population. When compared to the findings of Cilliers *et al.* (2005), the findings of the current study yielded a lower prevalence of underweight amongst females. This could be explained on account of a larger sample size in the current study as well as the gender and racial distribution between the two studies being different.

A mean BMI of 22.9 kg/m² amongst males and 27.1 kg/m² amongst females in the SADHS was reported by Puoane *et al.* (2002). The SANHANES-1 on the other hand, reported females and males having a mean BMI of 23.6 kg/m² and 28.9 kg/m² respectively (Shisana *et al.* 2013). The study conducted amongst students from the University of Stellenbosch, reported a mean BMI of 21.8 kg/m² among 360 first year female students (Cilliers *et al.* 2005). The current study documented a mean BMI of 23.2 kg/m² among males and 25.3 kg/m² among females. When compared to SANHANES-1 and SADHS studies, in the current study females also had a higher BMI than males. However, the current study documented a higher mean BMI among females compared to the female participants in the study of Cilliers *et al.* (2005).

In the current study, 35.8% of participants were overweight and obese. Malhotra *et al.* (2008) reported that 76.5% of the 637 urban black individuals residing in Khaylitha, Cape Town aged 18 years and older, were overweight and obese. Of the individuals who were overweight and obese, 53.4% were female and 29.2% were male. The current study found that 44.6% of females and 23.1% of males were overweight and obese. The latter findings compare favourably with that of Malhotra *et al.* (2008), whereby the prevalence of overweight and obesity was higher among females when compared to males. The SADHS reported that 29.2% of male and 56.6% of female participants, were overweight and obese (Puoane *et al.* 2002), whereas the prevalence of overweight and obesity in the current study was lower when compared to that of Malhotra *et al.* (2008) and Puoane *et al.* (2005).

The SANHANES-1 reported a prevalence of overweight and obesity of 24.8% and 39.2% in females and 20.1% and 10.6% in males aged 15 to 24 years respectively (Shisana *et al.* 2013). Ntuli (2005) reported that at DUT, 17% of the female students forming part of the study sample were overweight while 13% were obese. Among male participants, 10% were

overweight and 7% were obese. The current study findings documented that 25.1% of females were overweight and 19.5% were obese and 16.1% of males were overweight and 7.0% were obese. When comparing to the current study findings to that of Ntuli (2005), a higher prevalence of overweight and obesity was documented. The finding that the prevalence of overweight and obesity among females was higher than that of males, was in accordance with the trend documented by Ntuli (2005). However, when compared to the SANHANES-1 study, the prevalence of overweight and obesity was higher than in the current study, possibly due to the larger sample size that was also representative of South Africans in general. The trend regarding the gender distribution of overweight and obesity was however similar to that of SANHANES-1.

Findings of the current study was in line with that of Wilde & Peterman (2006), who stated that the prevalence of obesity was higher among food insecure young adult females than males. The current study was also in line with that reported by Buscemi *et al.* (2011) who explained that as food security status decreases, the prevalence of obesity increases. Thereby, indicating a possible link between food insecurity and the prevalence of obesity. It was also found that among female participants, overweight and obesity was more prevalent amongst those on financial aid, whereas among male participants, the opposite was true in that the prevalence of overweight and obesity was higher amongst non-recipients of financial aid

5.3 Dietary diversity among undergraduate students

It was evident that the current study sample lacked dietary diversity. The most frequently consumed foods included starchy foods (bread, rice, maize-meal, samp, breakfast cereals and porridge), fats (cooking oil, margarine and mayonnaise), tea and coffee, chicken, fresh milk, eggs and sweets. These results were in line with the report by Department of Higher Education and Training (2011) which conducted a survey amongst 104 440 students at 23 South African universities. Findings were that the most frequently consumed meal among participants residing at university residences was stiff pap (porridge) and milk. Ntuli (2005) reported a low consumption of vegetables, fruit and meat and a high intake of cereals and foods high in carbohydrate, sugar, salt and fat. In the current study, starchy foods proved to be consumed more frequently than any other foods whereas sources of animal protein excluding milk, vegetables and fruits were most often consumed two to three times a week. Ntuli (2005) stated that the eating pattern of students at DUT were westernized as the majority

reported to be eating foods from the cereal, meat, sweets and oil groups, with a very low intake of foods from the fruit and vegetable group.

In the current study, fresh milk was the most frequently consumed dairy product and was consumed on a daily basis by 37.3% of the study sample on a daily basis when compared to any other dairy products. Non-recipients of financial aid consumed fresh milk significantly more often than those on financial aid. In contrast, coffee creamer was consumed significantly more often on a daily basis by recipients of financial aid when compared to those not on financial aid. A possible reason for the latter finding is that coffee creamer is more affordable than milk powder or any other dairy product other than fresh milk. In addition, a lack of refrigeration facilities could also be a reason why coffee creamer is consumed regularly. Fresh milk was consumed by the majority of the study sample. However, only 37.3% of the study sample consumed milk on a daily basis possibly due to the fact that milk is costly and that they lack refrigeration. According to the FBDG, milk provides a rich source of high biological value protein and contains generous amounts of essential amino acids, minerals such as calcium, potassium and a good source of B vitamins (Vorster, Wenhold, Wright, Wentzel-Vijoen, Venter, Vermaak 2013) and should be consumed daily. Milk is important for the growth of young adults. However, from the current study findings it was found that only one third of the study population consume any source of dairy product every day.

Starch was the most popular food group amongst the study sample as 64.3% consumed bread, while 40.5% of the study sample consumed rice, mealie meal and samp at least once a day. Rice, mealie meal and samp were significantly more consumed by participants who were on financial aid. Breakfast cereals and porridge was consumed by 47.6% and 31.5% of participants respectively at least once a day. Bread intake was high as a majority of the study sample reported to consuming bread for all three meals (Ntuli 2005).

The most consumed source of protein was chicken (90.3%) followed by eggs (85.8%) and red meat (74.4%). Red meat was consumed significantly more often by non-recipients of financial aid, when compared to those who received financial aid. When it came to the daily consumption of other sources of protein, peanut butter was consumed by 18.1% of participants with the mean frequency of consumption being higher amongst non-recipients of financial aid (18.7%) compared to those on financial aid (17.5%). Although legumes are a

more affordable source of protein, it was seldom consumed by the majority of the study sample. In the current study, legumes were not consumed by 56.8% of the study sample which was less than that reported for students at DUT (Ntuli 2005).

Fresh vegetables were consumed by 15.8% of the study sample with the highest daily consumption occurring amongst non-recipients of financial aid (17.5%). Frozen vegetables was consumed by 17.0% of participants at least once a day, with the highest frequency of consumption being among non-recipients of financial aid (18.0%). 32.8% of the study sample consumed fresh fruit at least once a day, with the highest frequency of consumption amongst non-recipients of financial aid (31.6%). Although, the frequency of consuming fruit was higher than that of vegetables, the consumption of fruit and vegetables was lower than the recommended guideline of five a day according to the FBDGs (Naude 2013). Thus, one would expect the diet of participants to be low in micronutrients such as vitamin C, iron, folate, vitamin A, riboflavin, vitamin B6, zinc and magnesium (Naude 2013; Ntuli 2005; Oldewage-Theron *et al.* 2000; Badenhorst *et al.* 1998). Hence, the results of the current study were in line with that of Ntuli (2005) as 67.3% of the current study sample consumed less than one vegetable serving per day, compared to the 65.0% reported by Ntuli (2005).

Fats, irrespective of source, was consumed by 94.9% of the study sample at least once a day. Salty snacks were the most popular snacks consumed on a weekly basis by 72.0% of the study sample. Sweets were consumed by 38.3% of the study sample on a daily basis, with the highest frequency of consumption being amongst non-recipients of financial aid (40.1%). It was found that 38.3% of participants consumed alcohol. Of all the non-alcoholic beverages assessed, coffee and tea was the most frequently consumed as the mean consumption by 91.8% of the study sample was at least once a day. In addition, it would seem that the mean frequency of consumption was higher amongst those on financial aid. The most frequently consumed fast foods were French fries at 65.9%, pies and sausage rolls at 49.6%, followed by Honchos (a fast food outlet) at 43.0%. The least consumed fast foods were Nandos and McDonalds/Steers/Spur as they were assumed to be more costly than other fast foods. Fast foods in general was most often consumed once a week, possibly due to not being affordable despite being convenient.

More affordable food choices are often of a higher energy density and have a low nutrient content, whereas fruit and vegetables which have a higher nutrient content, are often more costly (Oldewage-Theron & Egal 2010). That could explain why these foods are consumed

less often. Students from low socio-economic backgrounds with insufficient financial assistance are more prone to the negative consequences of food insecurity as they are more vulnerable to consuming affordable foods which are nutritionally inadequate (Rose 2010). Such foods are generally ready-made foods that are high in fats and energy dense. Rose (2010) reports that low income individuals usually have difficulty in accessing fresh fruit and vegetables. Hence, they choose to spend available finances on affordable foods that are energy- but not nutrient dense. The latter can result in an increased risk for developing non-communicable diseases of lifestyle (Rose 2010). Moreover, students who reside closer to fast food outlets, are more likely to purchase unhealthy foods, even though there is a supermarket where one can make a better selection of healthier food options (Raphael 2009).

5.4 Prevalence of food insecurity between recipients and non-recipients of financial aid

Statistics South Africa (2014) indicated that one in five South Africans are food insecure. These findings are lower than that reported in the current study as nearly three out of four (72.4%) of the study sample were food insecure. Munro *et al.* (2013) conducted a study among 1 083 students at UKZN and found that more than 38.0% of the participants surveyed were food insecure with 11% being highly vulnerable to food insecurity. 12.5% of the study sample were severely food insecure, hence a higher prevalence of food insecurity than that reported by Munro *et al.* (2013).

However, the current study results were similar to that reported by Munro *et al.* (2013) and Hughes *et al.* (2011) who found that students who were receiving financial aid were significantly more vulnerable to food insecurity. The current study found that 53.4% of participants on financial aid faced food insecurity when compared to 46.6% of participants who were not on financial aid. Among 269 students from UKZN who were on financial aid 65.6% were reported to be food insecure, of which 12.5% were severely food insecure (Kassier & Veldman 2013). The current study found that 72.4% of participants faced food insecurity, of which 53.4% were on financial aid and also 12.5% being severely food insecure. Hence, the current study documented a higher prevalence of food insecurity than that reported by Kassier & Veldman (2013). The discrepancy between the findings of the current study versus that reported by Kassier & Veldman (2013), could be attributed to the fact that the current study had a larger study sample.

A study conducted at the University of Free State showed that 65% out of 1416 students surveyed were food insecure (Van den Berg & Raubenheimer 2015). Thus the prevalence of food insecurity documented by Van den Berg & Raubenheimer (2015), is lower than the findings of the current study. Moreover, in the current study it was also found that food insecurity was more prevalent among black undergraduate participants, including those who were unmarried, did not have part time employment and were recipients of financial aid. In addition, females were found to be more food insecure than males as opposed to the findings of Van den Berg & Raubenheimer (2015) who reported that male study participants were more food insecure compared to females.

5.5 Factors influencing food insecurity

The highest proportion of students on financial aid were black (43.9%). The latter finding is not surprising, seeing that UKZN reported that 88.0% of their student population are black (Department of Basic Education 2010). According to the Statistics of South Africa (2014), 79.8% of South Africa's population are black and within KwaZulu-Natal, 87.2% of the population are black. This indicates that the UKZN student population are representative of South Africa's general population.

During the course of the academic year, it was found that 41.6% of the study sample resided at student residence, 32.5% lived off campus and 25.9% lived at home. During the term, the majority of students resided in Scottsville (74.0%). Among those, 41.1% were on financial aid. It was found that 52.8% of participants' residential address was outside Pietermaritzburg while 38.0% resided in Pietermaritzburg. The majority of students whose home address was outside Pietermaritzburg, were recipients of financial aid. The majority of South African universities have limited accommodation for undergraduate students due to limited resources such as funds and lodging facilities (Weligamage 2007). However, UKZN offers on-campus and off-campus accommodation which is allocated based on the student's needs, academic standing, ability to pay for accommodation and where they reside outside of term time (Anon 2013). Given that the majority of students do not live in Pietermaritzburg, they had to resort to finding accommodation in close proximity of the university. This explains the high prevalence of students that live in both student residences as well as off-campus facilities. However, it has been reported that students who live far from home and therefore have to

resort to renting or sharing private accommodation, are more susceptible to being food insecure (Hart 2009) as the majority have to pay monthly rent which places strain on their financial resources. The latter was echoed by the findings of this study. In addition, it was reported that food insecurity is more prevalent among students who were boarding, renting or sharing accommodation, had minimal financial support from their parents or relatives and were recipients of financial aid offered by the government (Hughes *et al.* 2010).

When it came to students' immediate family members, 88.2% owned their homes, 7.6% were renting, 1.5% did not have a permanent residence and 2.8% lived in their homes free of charge. Results from the SANHANES-1 survey reported that of the 5 972 households surveyed, 39% indicated that they did not have sufficient money to purchase food and clothing and the majority of the households surveyed were in informal urban and rural settlements (Shisana *et al.* 2013). In the current study, 21.3% of the student's homes were situated in informal settlements.

An investigation into the water source of the study sample's parental home, found that 78.5% of the homes had running water in the house, 13.0% were making use of communal taps outside the house with a combination of other sources such as Jojo tanks, rivers and rain water. The remaining 8.5% of the households did not have access to a communal tap and made use of Jojo tanks, rain water, river water or a combination of water sources. These findings were similar to that of Statistics of South Africa (2014) who reported that 45.3% of households have access to water through piped water in their homes, while 26.8% have access to water in close proximity of their home and 15.2% of South Africans make use of communal taps. The latter is higher than what was reported in the current study. However, it has to be noted 21.3% of the study sample did not have a water source in their homes. At the University of KwaZulu-Natal, it is a basic requirement that a minimum of 15% of student enrolments should come from those who hail from poor socio-economic backgrounds, i.e. students who have completed their schooling at Quintile 1 or 2 schools (Anon 2013). Hence, confirming that a portion of students surveyed did come from a low socio-economic background.

Of the study sample, 45.8% (n=366) of students were on financial aid while 54.3% were not. Of those who were on financial aid, 72.1% were provided with financial aid from NSFAS while 13.9% had sponsors and 13.7% of were financed by government bursaries. Students

who are given government financial aid are categorized as at risk, since financial support is only offered to those whose socio-economic status is 20 to 39% below the poverty margin (Hughes *et al.* 2011). Hence, the South African government provides financial assistance to those who are financially deprived through NSFAS (Letseka & Maile 2008).

60.0% of the students forming part of the study sample were trying to find a part time job. However, more non-recipients of financial aid were actively trying to find part time employment (31.5%) as opposed to those on financial aid (28.5%). Of the students who tried to find a job, only 17.3% found employment, with non-financial aid recipients (10.8%) being more successful than those on financial aid (6.45%). This could possibly be indicative of lack of availability of part time employment. According to a study conducted among Australian university students, it was found that students who faced food insecurity had part-time jobs (Hughes *et al.* 2011) and that 16% of the students surveyed at the University of Free State had part-time jobs but indicated that their employment interfered with their studies (Van den Berg & Raubenheimer 2015). Thus, indicating that students will only try to find employment if their available funds are not enough to cover their living expenses while studying at a tertiary institution, even though it might limit the time available to focus on their studies. Moreover, 75.9% of the study sample received additional income from relatives and friends, of which 69.4% were not on financial aid while 30.6% were on financial aid. The fact that students who were not receiving financial aid were more likely receive an additional allowance, is possibly indicative of a greater reliance on an allowance to cover living costs. Their lack of financial aid could also be the reason why a slightly higher percentage of them were actively looking for a part time job to cover their living expenses. However, some students who received financial aid, also received an allowance. This could be indicative that their bursaries/loans/income/part time job was not adequate to cover their living expenses. In addition, some bursaries only cover tuition fees and no other additional costs incurred. Thus, necessitating the receipt of an allowance. Findings were that 22.9% of the study sample received a monthly allowance of R500-R1000, followed by 22.6% receiving an allowance of R100-R500 per month.

Nearly three quarters (72.5%) of the study sample were single, while 26.3% were in a relationship and 1.3% of the participants were married. Of the 220 participants who were in a relationship, 11.8% lived with their partner. As far as children were concerned, 11.6% of the study sample had children. Nearly eight out of ten (79.6%) had one child with the majority of

those with children being on financial aid (41.9%). 4.4% ($n = 35$) were recipients of government grants and 68.6% received a child support grant. According to Statistics of South Africa (2014), the percentage of individuals who received government grants escalated from 12.7% in 2003 to 30.2% in 2013. In addition, KwaZulu-Natal received the highest number of government grants compared to any other province in terms of the child support grant, foster child care grant, child disability grant, grant in aid and disability grant (SASSA 2014).

17.6% of students surveyed, indicated that they assisted their families/friends/partner financially. Of those, 87.2% were on financial aid. The largest amount of money given to assist families/friends/partner was 36.1% (R100-R200) and 21.3% (R200-R400). In addition, it was found that if students were given money from their relatives, they provided financial assistance to their partners and friends. Oldewage-Theron *et al.* (2006) who conducted research in the Vaal Triangle, reported that 68.8% of individuals surveyed had a monthly salary of less than R500, while 70.5% of the study sample indicated that they were often financially insecure. 58.3% admitted to spending less than R100 per week on food. In South Africa, 70% of the families of students who dropped out of higher education, were classified as being of a low socio-economic status. Moreover, black families were found to be the most affected by poverty, with some parents or guardians earning less than R1 600 per month (Letseka & Maile 2008). Due to the fact that majority of students are from a low socio-economic background, a considerable proportion of students face food insecurity as a result of transferring their funds to their relatives in order to support them financially (Tomaselli 2010). Hence, they use their student funding and money generated by part time employment to offer financial assistance to their families. According to the study conducted at the University of Free State, 21.6% of the study sample indicated that they supported somebody financially. This was most often parents/siblings/children (Van den Berg & Raubenheimer 2015). The percentage reported by the latter authors is lower than that found in the current study. In addition, the employment status of students' mothers was 42.0% for those having a full time employment, 6.5% for those having part time employment, while 33.0% were unemployed and the remainder (2.4%) being retired. When it came to the employment status of students' fathers, 35.9% had a full time employment, 4.28% were working part time, 13.88% were unemployed and the remainder (7.6%) were retired. Thus, it is possible that many of the students surveyed had families that were reliant on the students themselves as a source of financial assistance. The creation of job opportunities have been promoted from the mid-1990s. Nevertheless, job creation has not been sufficient to make a significant contribution to solving national poverty levels (Altman *et al.* 2009). South African

unemployment figures has increased from 100 000 to 4.6 million between the fourth quarter of 2012 and the first quarter of 2013, leading to an increase in the national prevalence of unemployment to 25.2 % (Statistics South Africa 2014). These unemployment statistics are similar to that generated by the current study for students' parents and could be indicative of why students experience such difficulty with finding part time employment.

According to the study findings, of the monthly expenses, rent was the greatest at R1829.29, followed by food (R531.82) and travelling costs (R454.). Study related costs were the lowest source of monthly expense R58.60. According to Munro *et al.* (2013), UKZN student's weekly food expense was approximately R127.93. The latter was found to be higher in the current study (R132.96). However, it should be borne in mind there has been a time lapse related to when the current study and that of Munro *et al.* (2013) was conducted and that there has been a steady increase in food prices on an annual basis. The 2014 PACSA Food Price Barometer reported that a group of 32 foods which form the basic foods in the shopping basket of underprivileged working class households in Pietermaritzburg increased from R1509.34 to R1640.05 in September 2014. Thus, representing an annual increase of 8.7% (Smith & Abrahams 2014). However, considering the increase in food costs, students that formed part of the current study sample are probably able to purchase less food for a Rand than that reported by Munro *et al.* (2013). Participants who receive some financial aid encounter financial difficulties to cope with additional costs such as food, outstanding tuition fees, accommodation costs, textbooks, stationery, transport and other expenses that add more financial stress leading to food insecurity (Letseka & Naidoo 2008). However, the current study findings are in accordance with that of Tomaselli (2010) who described how students spend their available funds on unnecessary purchases such as clothes, alcohol and other forms of leisure activities rather than investing in healthy food items and spending their available funds wisely in order to feed themselves. Letseka (2007) reported similar results, stating that a large proportion of students, mostly first those in their first year of study, over spend their available money on designer clothes, reckless consumption of alcohol and partying excessively as was echoed by the results generated by the current study. Students who live far away from home and have to spend money on rent, are more susceptible to being food insecure (Hart 2009) as paying rent places strain on their already fragile financial situation. The above explains why the largest portion of participants allowances are spend on rent.

Although UKZN provides support for food insecure students by means of food vouchers, only 11.9% of the students surveyed were aware of this support service. Of the above percentage, 19.0% reported to have made use of this service. In 2013 24 students, in 2014 25 students and in 2015 22 students made use of available food vouchers distributed on the Pietermaritzburg campus within the College of Agriculture, Engineering and Science. Although the prevalence of food insecurity among undergraduate students on the Pietermaritzburg campus is high, the number of students utilizing this food voucher service was low due to the lack of publicity related to this service being rendered. In addition, the policy regarding the assistance of food insecure students has not been approved by UKZN management and as yet, the university indicated that the funds for assisting food insecure students is low.

Approximately 95.9% of participants surveyed, among which, 45.0% of participants were on financial aid, agreed that the price of food influences their purchases. Households facing poverty spend a much larger proportion of available funds (70%) on food, fuel and electricity, unlike those of a higher socio-economic status who spend a larger proportion of their available funds on transport and medical care (Bhorat & Oosthuizen 2005). Thus, poor households are relatively more vulnerable to food price fluctuations as it is their major expense (Labadarios *et al.* 2009; Bhorat & Oosthuizen 2005). Since the majority of participants' households surveyed in the current study are not financially secure, it explains why the majority of participants indicated that they were affected by food price fluctuations.

As far as time is concerned, 72.9% of the students indicated that they had time to cook while 91.4% reported that they had the necessary facilities available to prepare food, even though they had to share facilities such as stoves and fridges. Of the study sample, 57.9% were found to be the hungriest at the end of the semester with a higher prevalence of this report coming from students on financial aid (28.0%). It was also found that 33.9% and 47.3% of students were the hungriest mid-afternoon and at mid-day respectively. The majority of the study sample, indicated that they were the hungriest at the end of the semester. This finding coincides with the examination period as was confirmed by Kassier & Veldman (2013).

42.6% of students faced hunger and its associated fatigue and apathy of which 53.1% were not recipients of financial aid while 46.9% were on financial aid. It has been reported that students who are of a low socio-economic status, find it difficult to concentrate on their academic tasks as they do not have sufficient funds to feed themselves. This leads to them

viewing themselves as being weak academically (Naidoo 2008). Results generated by the current study were that 55.0% of students were experiencing symptoms of depression, laziness, lack of interest and stress, among which 44.3% were on financial aid compared to 55.7% who were not on financial aid. Based on the above findings, it is imperative that the prevalence of depression among students at UKZN requires further investigation, especially among first year students as the first few years at university is a period of transition for the majority of students. In addition, it represents a sudden shift in terms of education and learning, coping with the transition of leaving home, being independent, learning new adult responsibilities and being exposed to a new network of people in a new environment. The above can be very overwhelming for the majority (Mojs *et al.* 2012). Shaikh *et al.* (2004) reports that students who receive financial assistance have to cope with more stress compared to those who are not recipients of financial aid. This latter is due to financial stressors as the majority of students on financial aid hail from very impoverished circumstances and experience additional sources of financial stress, even though their tuition fees and accommodation may already be paid for. This justifies why the current study findings indicated that there are more students on financial aid who experienced symptoms of depression and stress.

52.4% of students surveyed reported to being hungry due to a lack of time for food purchase/preparation. Just over four out of ten (43.4%) of participants indicated that they did not have enough money to purchase food, of which 55.0% were recipients of financial aid. Van den Berg & Raubenheimer (2015) reported that 70.5% of participants reported not having money for food, which was higher than the findings of the current study. It was also noted that 65.8% of the participants struggled to concentrate in class due to hunger of which, 52.3% students were not on financial while 47.7% were on financial aid. Moreover, 21.3% of participants forming part of the current study sample reported to have lost weight with a higher prevalence among students who were on financial aid (55.3%). 77.0% of participants reported that they cannot eat a variety of food due to a lack of resources with the highest response rate being from students on financial aid (58.2%). The majority of students on financial aid (54.2%) also indicated that a lack of dietary variety occurred especially at every month end.

Of the 333 participants who lived in student residence, 75.1% indicated that they have a secure storage place for food, while 24.9% reported that they did not. Of the participants who

lived in student residence, 73.0% reported to have had their food stolen. Food theft in student residences negatively affects food stability and food availability which are important aspects in maintaining food security (Hart 2009) while communal kitchens for student use in University residences or communal houses, are known to increase the risk of food theft. This has a direct effect on students' food security status (Tomaselli 2010; Hart 2009).

5.6 Coping strategies adopted by undergraduate students

Shisanya & Hendricks (2011) reported that 83% out of 53 rural households surveyed consumed smaller meals in order to cope with food insecurity. Oldewage-Theron *et al.* (2006) reported that 80% of the households surveyed were cutting down on portion sizes in order to cope with food insecurity. However, the current study found that 70.6% of students surveyed have been eating smaller meals in the past month. In addition, it was found that 85.0% of students surveyed were not able to eat the food that they preferred. Smith & Richards (2008) also referred to the latter finding by reporting their study subjects were eating anything available in their households in order to cope with a lack of resources and food. Shisanya & Hendricks (2011) reported that 91% of their study sample consumed fewer meals during the day in order to cope with food insecurity. However, 67.0% of the current study sample consumed fewer meals as a coping strategy which was less than that reported by the literature. Ngidi (2007) conducted a survey among 268 rural households, and found that 91% were consuming less preferred and more affordable foods. The latter statistics were higher than that reported for the current study.

A study conducted in the Vaal Triangle found that 74.7% of the study sample were limiting the variety of food served in their households in order to cope with a lack of available food (Oldewage-Theron *et al.* 2006). These statistics were found to be higher than that reported in the current study where 77.6% of students were limiting the variety of food consumed as a coping strategy. Oldewage-Theron *et al.* (2006) reported that 68.4% of their study sample have been skipping meals. Among the 202 respondents aged 9 to 18 years surveyed among homeless shelters in Minneapolis, Minnesota (a rural area), 45% reported to not having sufficient food in the home (Smith & Richards 2008). However, the current study found that 59.5% of the students surveyed have not been consuming sufficient food. Smith & Richards (2008) also reported that 25% of the study sample surveyed went to bed hungry. However,

the current study reported that almost double the amount of students (49.1%) had gone to bed hungry in the past 30 days.

According to the study findings, 19.3% (n = 154) of participants reported to have sold possessions as a coping strategy to obtain money for purchasing food. Similar findings were reported by Mjonon (2008), who reported that 67% of the 200 rural household inhabitants surveyed sold their possessions in order to purchase food. Mjonon (2008) also reported that borrowing money was also used as a coping strategy. The latter findings were similar to that found in the current study that 66.5% of the study sample borrowed food. Furthermore, Hughes *et al.* (2011) who conducted a study among Australian university students, reported that students who faced food insecurity borrowed money and food in order to cope with their situation. These findings were similar to the current study who found that 66.5% of participants borrowed money and 34.5% borrowed food. Smith & Richards (2008) reported that among the 202 respondents aged 9 to 18 years surveyed stated to be eating meals from families and friends when faced with food insecurity. This finding was also in line with the 1.5% of the current study sample who indicated that they visited friends/relatives at meal times.

Kassier & Veldman (2013) reported that 45.5% of the study sample surveyed borrowed money from friends, 16.3% borrowed money from family and 10.6% stated that drinking fluids helped to curb hunger. These findings were similar to that of the current study. However, the percentage of participants who borrowed money proved to be more than what was reported in 2013 by Kassier & Veldman, as 66.5% of participants borrowed money and 34.5% borrowed food. Also, 1.63% of participants reported to be starving and drinking water in order to suppress their hunger. Van den Berg & Raubenheimer (2015) reported that 70.5% of their study sample revealed that they have been borrowing money to buy food, 53.3% asked someone for food, 9.2% claimed to have sold their belongings for food and 1.6% confessed to having stolen food. The findings of the current study were similar to the latter with 66.5% borrowing money and 34.5% borrowing food, despite it being lower than the statistics reported by Van Den Berg & Raubenheimer (2015). However, a higher proportion of participants reported to have sold their possessions (19.3%) while 10.4% admitted to stealing food and 4.6% reported that they stole items and money to purchase food. The current study also found that of the 19.5% of participants who sold their belongings to purchase food, 32.5% sold text books of their own or stolen ones, followed by 11.7% who

sold electronic equipment, consisting of mostly of laptops, calculators, pen drives, speakers and cell phones.

From the study findings it was evident that when participants are faced with food insecurity, different coping strategies are employed and food theft is a way of obtaining food in emergencies as was also reported by Hughes et al. (2011). Additional findings were that 0.25% of the study sample admitted to offering sexual favours to acquaintances and friends to generate an income. Govender (2008) and Nyamayaro (2015) reported that at the University of Pretoria where students have been resorting to prostitution on the streets as their families cannot support them financially. Moreover, Nyakurimwa (2011) stated that when faced with hunger and a lack of food, women resorted to prostitution. However, in the current study the number of participants who reported to resorting to prostitution was negligible (0.25%). It is however possible that this coping strategy could have been underreported by the current study sample due to the fact that it could be viewed as a social taboo that could result in stigmatization by some.

5.7 Conclusion

The long term effect of hunger and food insecurity seen in both developed and developing countries seems to be spreading to university campuses. The eating pattern of the study sample was indicative of a westernized eating pattern as the majority of those surveyed consumed starchy foods that were energy dense and high in salt with a low intake of micronutrients due to limited consumption of fruits and vegetables. Almost three quarters of the sample were facing food insecurity and one eighth was severely food insecure. More than half of the study sample did not have sufficient food, nearly half of the study sample went to bed hungry and one third of the study sample went without food for more than 24 hours due to lack of money to purchase food. Coping strategies employed when faced with food insecurity, resulted in two third of the study sample borrowing money and a third borrowing food. Stealing and selling of possessions were also used in order to cope with food insecurity. In the current study sample, food insecurity may not only be a threat to academic performance, but may also threaten the physical and mental health of food insecure students.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

Globally, South Africa finds itself to be among countries that have the highest prevalence of unequal income distribution. When compared to other middle income countries, it has an extremely high level of absolute poverty. At least a quarter to a half of the South African population is affected by food insecurity (Altman *et al.* 2009). Although, South Africa can be viewed as food secure, a significant number of households are food insecure. In order to solve this problem, the creation of job opportunities have been implemented since the mid-1990s (Altman *et al.* 2009). However, this has proven to be inadequate to significantly alleviate the prevalence of poverty. To combat food insecurity, financial security is crucial. Hence, the South African government foresaw the investment in education as an approach to eliminate poverty and increase economic growth (Ngidi 2010; Letseka & Maile 2008). However, at 15% per annum, the South African university graduation rate is one of the lowest in the world (Leseke & Maile 2008).

A significant number of South African students enrolling in tertiary education come from previously disadvantaged backgrounds characterized by social and economic adversity that cannot be overlooked (Naidoo 2008; Letseka 2007). Some of the factors that influence the latter state of affairs include financial problems, social problems, environmental change, challenges related to accommodation and food insecurity (Leseke 2007). Even though the South African Government provides financial assistance to students by means of the NSFAS, it has been stated that the amount of available funding is insufficient to cover the cost of student fees, textbooks, transport, accommodation and food which results in a significant number of students being food insecure (Naidoo 2008).

In order to gain insight into the impact of food insecurity on the student community and address the problem, appropriate recommendations that are evidence-based, are needed for the development of future strategies that can be implemented to address food insecurity among UKZN students. This can be achieved by gaining an understanding of how students cope with financial stress. By investigating the coping strategies of undergraduate students when faced with food insecurity, it can make a contribution towards finding appropriate solutions to not only improve the prevalence of food insecurity, but address academic performance as

these two variables are interrelated. Hence, the purpose of this study was to investigate the prevalence of food insecurity and related coping strategies among undergraduate students registered at the University of KwaZulu-Natal, Pietermaritzburg campus.

6.2 Conclusions of the study

The mean BMI of the study sample was $24.3 \pm 4.8 \text{ kg/m}^2$. Statistically there was no significant difference in BMI of the study sample as a whole when comparing students on financial aid versus those that were not recipients of financial aid. The mean BMI of males was $23.2 \pm 4.5 \text{ kg/m}^2$ while that of females was $25.3 \pm 5.3 \text{ kg/m}^2$. Nearly six out of ten (59.6%) participants had a normal BMI, while 4.8% were underweight, 21.4% were overweight, 10.9% were obese class I, 2.6% were obese class II and 0.9% were obese class III. Female participants were found to have a higher prevalence of overweight (25.1%) and obesity (19.5%) when compared to male participants who had 16.1% prevalence of overweight and 7.0% of obesity. Female participants also had a higher prevalence of underweight (5.1%) when compared to male participants (4.3%). Therefore in the current study sample, female participants had a higher prevalence of overweight and obesity when compared to male participants. In addition, overweight and obesity was more prevalent among food insecure females than males. The mean BMI of participants who were not on financial aid indicated that male participants had a significantly higher BMI when compared to those on financial aid. Females were found to have a significantly higher BMI compared to males regardless of whether they were on financial aid or not. Obesity and overweight was more prevalent among financial aid students compared to non-recipients of financial aid. Hence, the hypotheses that there would be no significant difference in the BMI among undergraduate students receiving financial aid and those not receiving financial aid was rejected.

There was a lack of dietary diversity in the diets of the study sample. The most frequently consumed foods included foods from the starch group (bread, rice, maize-meal, samp, potato and pasta), fats (cooking oil, margarine and mayonnaise), tea and coffee, breakfast cereals and porridge, chicken, eggs and sweets. The frequency of consuming fruit was higher than that of vegetables, however the consumption of both vegetables and fruits were low. Thus, it is to be expected that the diets of students were low in micronutrients. The eating pattern of students was westernized as the majority of the study sample were consuming foods from the cereal, meat, sweets and oil groups, with a low intake of foods belonging to the fruit and vegetable

group. It was found that 67.3% of the study sample consumed vegetables less than once a day. Legumes were not consumed by 56.8% of the study sample while bread intake was high with the majority of the study sample consuming bread at least once a day. Students coming from low socio-economic backgrounds with inadequate financial assistance were more prone to the negative consequences of food insecurity as they were more likely to consume affordable foods which have a low nutrient density. This would potentially place these students at risk for developing micronutrient deficiencies. Students who received financial aid were more likely to have a lack of money, this making the consumption of a nutritionally adequate diet unaffordable. The cost of nutrient dense food options are often more expensive when compared to their energy dense counterparts. Since there was no significant difference between the dietary diversity of students on financial aid versus those who did not receive financial aid, the hypotheses that there would be no significant difference in the dietary diversity between undergraduate students receiving financial aid and those not receiving financial aid was accepted.

There was a high prevalence of food insecurity among the study sample. The results of the current study indicated that 27.6% of the study sample were food secure whilst 72.4% of the study sample were facing food insecurity. Of the latter, 31.6% were mildly food insecure, 28.3% were moderately food insecure and 12.5% were severely food insecure. Among the students facing food insecurity, 53.4% were on financial aid and 46.6% were not recipients of financial aid. Nearly six out of ten of the female participants (57.3%) were more food insecure compared to male participants (42.7%). Over three quarters (77.6%) of the study sample were limiting the variety of food consumed due to food insecurity. The three most severe conditions of food insecurity (running out of food, going to bed hungry because there is no food and, going the whole day and night without food) were experienced by 12.5% of the study sample. Statistically significantly more students on financial aid were faced with mild food insecurity, moderate food insecurity and severe food insecurity compared to those who were not on financial aid. Hence, the hypotheses that there would be no significant difference in the prevalence of food insecurity among undergraduate students receiving financial aid and those not receiving financial aid was rejected.

Two third of the participants were trying to find a part time job while studying. The percentage of non-recipients of financial aid who were trying to find part time employment (31.5%) was higher than those on financial aid (28.5%). 17.6% of the study sample

admitted to have been assisting their families/friends/partner financially. Of those providing financial assistance to their families/friends/partner, 87.2% were on financial aid. The study sample spent most of their monthly budget on rent and food. The latter is characteristic of a household with a low socio-economic status. Students whose permanent address is far from UKZN, are reliant on staying at a student residence or renting private accommodation. Due to the additional expense incurred, it increases their susceptibility to becoming food insecure. In addition, food prices and fluctuations in food prices place students at a greater risk for becoming food insecure, especially when food price hikes occur. Study participants were found to be the hungriest at the end of the semester as well as mid-day or mid-afternoon. As food insecurity and hunger impair concentration, students who hail from a low socio-economic background, may find it difficult to concentrate on their academics. Under these circumstances an inability to concentrate can result in students perceiving themselves as being academically weak. The latter is of importance, as 65.8% of the study sample indicated that they struggled to concentrate in class due to hunger.

In the current study, the majority of students on financial aid reported symptoms of depression, apathy and laziness. This finding could be associated with the fact that the first years of tertiary education are often viewed as a period of transition with a sudden shift in terms of education and learning concepts, coping with the transition of leaving home, becoming independent, learning new adult responsibilities and being exposed to a new network of people in a new environment which can be experienced as being very overwhelming. 57.9% of participants were found to be the hungriest at the end of the semester with a higher prevalence being documented among students on financial aid (28.0%). More than half (52.4%) of students reported to being hungry due to a lack of time to purchase/prepare food. 43.4% of the study sample indicated that they did not have enough money to purchase food. Of these, 55.0% were on financial aid. In addition, 21.3% of participants reported to have lost weight with a higher prevalence of this phenomenon being among students on financial aid (55.3%) that could be ascribed to food insecurity. Of the 333 participants who stayed in student residences, 73.0% claimed to have had their food stolen. Hence, the hypotheses that there would be significant difference in the factors that influence food insecurity among undergraduate students receiving financial aid versus those who did not receive financial aid was rejected.

In order to cope with food insecurity, students adopted different coping strategies to sustain themselves. This included borrowing money, borrowing food, visiting family and friends at

meal times, stealing food and other items to obtain money for food purchases and selling possessions such as text books and electronic equipment that included cell phones, laptops and pen drives. Starving, sleeping and drinking water to curb hunger was also reported. It was also found that among a minority of students, sexual favours were offered to acquaintances and friends for payment in order to purchase food. Dietary changes were adopted first, followed rationing food and finally resorting to increasing short term food availability. Participants started changing their existing dietary habits when faced with a lack of food and when the shortage of food gets more severe, the participants started rationing their food by not consuming their preferred food and limiting their number of meals and portion sized. Eventually, as food availability decreases, the participants started finding short term ways of getting food such as stealing and borrowing. Students on financial aid adopted significantly more coping strategies when compared to non-recipients of financial aid in order to cope with financial stress and food insecurity. The hypotheses that there would be no difference in the coping strategies adopted by undergraduate students receiving financial aid versus those not receiving financial aid was therefore rejected.

6.3 Critique of the study

6.3.1 Study constraints/limitations

At the time of data collection, students from UKZN, Pietermaritzburg campus, were on strike. As a result, only 800 students could be recruited for participation. The pilot study indicated that the questionnaire would take 15 minutes to complete, thereby preventing respondent fatigue. However, when the actual study was conducted, it took some students more than 15 minutes to complete the questionnaire. It is therefore possible that respondent fatigue could have influenced participants' responses. A larger study sample would be beneficial as it would give the results a greater statistical power. Moreover, a more randomized method of sampling could have been used instead of convenience sampling to further reduce bias. The study could be conducted in all the campuses not only Pietermaritzburg to gain better understanding and insight of the level of food insecurity among tertiary students. To limit bias the questionnaire was designed to be self-administered to prevent the respondents from being influenced or answering dishonestly.

6.3.2 Recommendation for improvement of the study

Should a future survey of this nature be conducted on all UKZN campuses, it would provide better insight into the food insecurity faced by the UKZN students in general as well as being representative of the racial diversity of undergraduate students. In addition, a larger sample size would have increased the statistical power of the study and using a mixed methods study design for data collection would have also added depth to the study findings. When assessing the dietary diversity of the students, only a food frequency questionnaire was used. However, the FAO dietary diversity scales could have been used and a 24 hour recall could have been included to gain better insight of the dietary spread of students. Due to time constraints the FAO dietary scale and the 24 hour recall could not be used in this particular study. A focus group could have been conducted in conjunction with the coping strategy index, in order to score the individual and gain a more understandable information about the level of the students coping strategy.

6.4 Recommendations for nutrition practice

- A national survey should be conducted to determine what a realistic amount of NSFAS funding for underprivileged students should be in order to cover their studies as well as living expenses. However, an investigation of this nature will have to be preceded by research with convincing evidence that food insecurity has an adverse impact on academic performance.
- All student residences at UKZN are self-catering and do not provide adequate facilities for food storage and preparation. It is therefore recommended that university residences should provide wholesome meals for students on a daily basis to ensure that students receive adequate nutrition in order to facilitate optimal academic performance.
- Food banks should be established at all UKZN university campuses. These are non-perishable food pantries that could be established on campuses and can be sponsored by voluntary food contributions from individuals, nearby businesses, governmental and non-governmental organisations (NGOs), the community and even students. This venture could be overseen by the student counselling centre (SCC), which will be responsible for the issuing of food to eligible students.

- A designated team should be assigned to take charge of the UKZN Food Security Programme in order to drive the adoption of a policy with a vision and mission to pave the way for adopting a long term, sustainable strategy to assist food insecure students across all UKZN campuses but also aid in the identification and adoption of appropriate criteria regarding student eligibility in order to benefit from this programme.
- Food gardens could be encouraged at university student residences as they will serve as an additional source of food to needy students and contribute to dietary diversity. This venture could be made possible through liaison between the Department of Agriculture, SCC and interested NGOs. The Department of Agriculture could be the main sponsor of seed and provide training regarding the cultivation of food gardens. Students could also be given the opportunity to contribute to the cultivation of produce in food gardens for a small monetary reward and/or other benefits. Food insecure students could then be provided with vegetables from these gardens as part of the UKZN food insecurity campaign.
- It is recommended that the orientation programme of first year students should include workshops on life skills that include budgeting and the acquisition of basic nutrition knowledge to facilitate healthier and more affordable food purchases as well as spending available funds wisely.
- It is also recommended that where students are faced with making use of private accommodation due to a lack of student residences, the rental of these facilities should be overseen by UKZN to ensure that students are not being exploited.
- Food vouchers could be provided in the form of swipe cards (as is implemented at the Free State University) so that students receiving any form of financial assistance can be monitored to ensure that a certain portion of their financial aid could be redeemed at specific stores and for healthy foods choices. Hence, e.g. their monthly financial aid can be loaded onto their swipe card for food purchases, while their accommodation will be paid for by their respective sponsors so that a limited amount can be allocated to transport and additional study-related costs.

6.5 Implications for future research

As there is current interest regarding the relationship between socio-economic factors, food insecurity and its related coping strategies, the focus of this study was to address the gap in the existing knowledge base in order to create an awareness of food insecurity and its impact on academic performance among students enrolled for tertiary education. Hence, the current study design can be used as a basis for further studies that investigate coping strategies in relation to food insecurity among students in order to assist them in achieving their academic potential and curbing national poverty levels.

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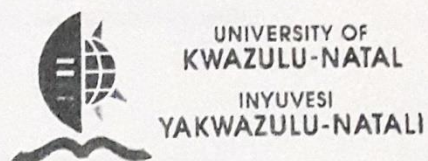
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APPENDIX A



REGULATORY FRAMEWORK FOR FOOD SECURITY PROGRAMME, STUDENT SERVICES DIVISION, UKZN

Name of document:	REGULATORY FRAMEWORK FOR FOOD SECURITY PROGRAMME, STUDENT SERVICES DIVISION, UKZN	
Reference number: <i>(supplied by Office of the Registrar)</i>		
Originator Author: <i>(name and position)</i>	Dr. S. Chalufu	
Custodian: <i>(position/office)</i>	Executive Director of Students, UKZN	
Approved by:	Structure:	Date:
Effective date:		
Document review date:		
Implementation responsibility:	Executive Dean of Students	

1. PURPOSE STATEMENT

The Food Security Programme is designed to allow financially needy students to have access to support for food insecurity and personal hygiene matters. The purpose of the regulatory framework is to:

- 1.1 Identify the criteria for the support of indigent students.
- 1.2 Promote the nourishment/well-being of indigent students and
- 1.3 Promote the sustainability of the Food Security Programme at UKZN.

2. INTRODUCTION AND BACKGROUND

Students from impoverished backgrounds who perform poorly because of severely inadequate nourishment, personal hygiene and care, are increasingly encountered by staff at the University of KwaZulu-Natal (UKZN). Efforts to help them are ad hoc and random and need to be co-ordinated centrally through the office of the Executive Director of Student Services, to have maximum effect for the benefit of the student. This is the case all over the world, in countries where poverty and disadvantage have impacted on development. A paper in press by Munro, Simpson, Quayle and Barnsley (2011), reports that 4.7% of students at the University of KwaZulu-Natal experience severe to critical levels of vulnerability to food insecurity. This proposal from the Support Services, within the Division of Student Services at UKZN, is intended to assist students identified as needy, by providing Academic Support packs, for the provision of food for eight months of the year. It is anticipated that this endeavour, along with the reinstitution of the Work Study Programme and community involvement, will help address the problems students face, in a practical way.

Student Funding support at UKZN, in the form of financial aid, bursaries and scholarships are insufficient in themselves to enable financially needy students to meet their basic needs. The resulting financial difficulties and consequent accommodation and meal difficulties cumulatively impact on the academic performance of the financially needy, the majority of whom come from previously disadvantaged communities. In the study by Munro et al (2011), students on financial aid were found to be significantly more vulnerable to food insecurity when compared to that not on financial aid. A similar relationship was found between students in an access programme, where their level of vulnerability to food insecurity was compared with those in mainstream programmes.

One of the goals of Support Services within the Division of Student Services at UKZN is to facilitate access, retention and exit of students. Reports from the colleges and academic staff suggest that there is a strong need for students to be supported holistically to ensure academic success and throughput.

The Food Security Programme at UKZN is hence designed to:

- Create awareness about the serious problems of food insecurity and the threat that it poses to students' academic performance, degree completion, entry into the labour market and social and economic advancement and transformation;
- Provide support in the form of food parcels, vouchers and/or hampers to indigent students who act responsibly and ethically.
- Empower students to become self-supporting by providing opportunities for part-time employment and re-instituting the Work-Study Programme to give students the opportunity to earn a subsistence income.

Commented [u1]: This aspect does not seem to be catered for in the plan

Commented [u2]: Not clear what "this" refers to

Commented [u3]: Comment 1

Commented [u4]: Why 8 months as the academic year is in fact closer to 10 months if you include the exam sessions which is a time when students are often hungry and have run out of funding

Commented [u5]: But it looks like students on FA will be excluded from the plan?

- Inculcate a culture of self-support, self-reliance and consciousness of abundance. Student initiating campaigns to educate other students on alleviating poverty and victim consciousness.

Commented [u6]: Sentence seems incomplete?

3. DEFINITION OF TERMS

Food Security Programme – (FSP) refers to the programme that offers indigent students food support in time of need.

4. SCOPE

The regulatory framework applies to indigent students on the Food Security Programme at UKZN. The Programme will cater for financially needy students as determined by the means test done at Student Funding. Mostly first entry indigent students with no funding and students who are awaiting funding from NSFAS and other donors/sponsors will be eligible.

Commented [u7]: See comment 5

5. PRINCIPLES

- 5.1 There will be an institutional response to the problem through a well-co-ordinated programme. Ad hoc interventions by any sector of the university shall not be allowed.
- 5.2 All students on the Food Security Programme shall be supported during times of need more especially at the beginning of the year and closer to the examination periods.
- 5.3 Only students who are referred, screened and properly assessed will be supported by the programme.
- 5.4 Students will be eligible to receive food parcels/hampers/vouchers and/or be issued with cards to be swiped through the card system.
- 5.5 Students will not be allowed to exchange food parcels/hampers/vouchers for cash.
- 5.6 Students on the Food Security Programme will be assisted through the Student Employment Office and be encouraged to find part-time/vacation work, learner ships and/or internships.
- 5.7 All students on the Food Security Programme shall attend psycho-educational and life skills training (individual and group based) in money management and budgeting.
- 5.8 The Food Security Programme will be co-ordinated by staff in the office of the Executive Director of Student Services.
- 5.8 Interventions regarding the Food Security Programme will be tied to the academic progress of the student.
- 5.9 Students participating in the Food Security Programme must be able to “give back” to the community. Students will be required to offer voluntary assistance during Open Days, Sports Events, Careers Fairs/Exhibitions, Orientation, Registration and other related programmes and activities. Students will also be required to participate and contribute to vegetable gardens.

Commented [u8]: This seems a bit prescriptive. Why not say “will be discouraged”

Commented [u9]: For how long?

Commented [u10]: Too vague.

Commented [u11]: Too vague. Will need to be spelt out in a contract with the student

6. ELIGIBILITY

6.1 To be eligible a student must be deemed financially needy.

A "Financially needy" student shall be defined as a student who meets the criteria for funding support by:

- Virtue of being a first entry indigent student in an Access/Foundation programme;
- Having a history with the Registration Appeals Committee (RAC);
- Providing proof that funding has been withdrawn for their current registration but are in debt to the university;
- Having refugee status;
- Providing proof that family support is minimal;
- Other factors as identified verified and confirmed by ADO/Academic leader/lecturer and counselling staff in a college.

6.2 Students must meet their respective progression requirements in terms of their academic programme.

6.3 Students must have attended the skills training in financial management provided by the counsellors in the colleges.

Note: Students who have paid employment at the university such as tutors, demonstrators, mentors, student assistants and research assistants shall not be eligible.

7. IMPLEMENTATION PLAN

It is anticipated that the following implementation plan will be most effective:

- Requests for students to be on the Food Security Programme will come via referrals from academic staff, counselling staff, Student Funding, Residences, SRC and "word of mouth".
- Students will be screened and assessed by the counsellors in the colleges and put onto the programme after all due processes are completed.
- Upon verification of the financial neediness of the student an agreement will be signed by the student. A university indemnity form will also be signed indemnifying itself from all risks, obligations and unforeseen circumstances in the implementation of the programme.
- There will be monitoring of all students on the programme by the counselling staff and/or other staff designated in the colleges.
- Students will be weaned off the programme when they are able to support themselves. This will be done through the assessments carried out by the counsellors, other staff designated in the colleges, Financial Officer in the college and staff co-ordinating the Food Security Programme at UKZN.
- Students will follow office hour procedures to collect food parcels/vouchers and cards.

Commented [u12]: Also by FA advisors

Commented [u13]: This will need to go through legal services

Commented [u14]: Too vague. How often and how?

The University previously experienced problems with financially disadvantaged students who could not afford to buy the necessary textbooks to support their academic studies. It realized that **without this critical academic support**, the student would inevitably fail to progress

year after year. The answer lay in the provision of critical lecture note packs which were charged to the fee account as part of the tuition fee structure. For funded students, this meant that the sponsor covered the full value of the academic programme including the **lecture packs which on average added 5% to the cost of tuition.**

"ACADEMIC SUPPORT PACKS" TO SUPPORT THE ACADEMIC ENDEAVOUR OF INDIGENT STUDENTS

In a similar fashion, it is proposed that identified students have their fee accounts debited with an **"Academic Support Pack Levy"**. This coding would be part of the academic charges and could be offset by any Food Bursary Fund instituted by the University community. This will not be immediately or solely reliant on finding sources of funding prior to being instituted. The debit will be raised for students to carry and students who receive this benefit will take full ownership. The risk of the debit will be carried by the university as it does for the study packs. There are 3 alleviating factors that substantiate this recommendation:

- A Food Bursary Fund will be established to cover this debt.
- The Work-Study Programme if re-instituted will recover some of the debt.
- The students on the Food Security Programme will perform better academically and hence become eligible for bursaries, scholarships and loans, thereby reducing the number of students reliant on the Food Security Programme.

This amount raised on the fee account of the student would then reflect as a **credit** in an electronic card which is supplied by vendors known to Student Funding e.g. EduLoan & Intellicard. The electronic card would entitle the user to food supplies from either a participating Pick'n Pay, Checkers or Spar or a full nutritional meal at specified vendors on every campus for 7 days per study week (8 study months). At 50% of the normal NSFAS annual allowance this would enable the student to access food resources to the full current value of **R330 per study month (R2650 per annum)** and would amount to no more than **10%** of the actual tuition cost per student.

Commented [u15]: See comment in previous doc

All students benefitting from this programme would pay this back to the institution in the same way that they currently meet their fees.

Estimated costs are attached in Annexure 1.

Furthermore, the university must give serious and careful consideration to re-instituting the Work Study Programme. This is an enabling and supportive programme that gives students the opportunity to gain work experience and alleviate "hunger problems". The ratio of 60:40 will apply, where 40% of the money earned goes to the student's fee account. This programme amounted to approximately R1m in 2010, where hundreds of students did benefit.

Commented [u16]: How? Evidence?

CONCLUSION

Through this programme, which makes a real and practical effort to assist students and make their university life bearable and manageable, UKZN will be seen to be actively supporting its financially needy, "at risk" students. The social/community responsibility of the university will be portrayed more positively; indeed; it will advance the role of the university and community of donors, without detracting from the ownership of the problem by the individual student. This will most certainly alleviate thinking along the lines of poverty and victim consciousness.

ANNEXURE 1

FINANCIAL IMPLICATIONS

Approximately **875 students** were enrolled without any funding in 2012 in Access and Foundation programmes. This number does include students enrolled at UKZN in other programmes who do not have any funding. This number could rise to about **1 646**. Based on the aforementioned number of students, the maximum initial financial exposure for the University would amount to **R 4 345 440 (1646 students x R 2,640 each)**.

Commented [u17]: These numbers do not correspond to numbers in the previous document. Citation?

As previously mentioned the cost of this program could be offset by funding from the yet to be established Food Bursary Fund and contributions from the Work Study Program, an enabling and supportive program that gives students the opportunity to both gain work experience and alleviate "hunger problems". A ratio of 60:40 will apply where 40% of the money earned in this manner by the student will go to his/her student fee account, partially settling the academic support pack levy granted.

Commented [u18]: What happens to the other 60%?

This total maximum amount for "**Academic Support Packs**" of approximately R 2,048,640 will represent a marginal risk to UKZN compared to the possible overall advantage of better performing students, who could then succeed academically, enhancing their chances to be supported in full by sponsors. To further put matters into perspective, the current annual turnover of Student Funding at UKZN is in the region of **R 500 million** annually to academically deserving students.

Estimated costs:

Academic Support Packs 1646 students x R2 640	R 4 345 440
Work-Study Programme (all campuses) if approved	R 1 000 000
Total cost	R 5 345 440

The cost of Academic Support Packs could be offset by any funds raised via a Food Bursary Fund from donations/sponsorships for that specific purpose.

APPENDIX B

COVER PAGE FOR SUBMISSIONS TO FORMAL STRUCTURES UNIVERSITY OF KWAZULU-NATAL

SUBMISSION IDENTIFIERS:

Title	Proposal regarding interim implementation of food security programme in the College of Agriculture, Engineering and Science
Author and position	Ms Shelley Barnsley Manager: Student Support CAES

APPROVAL HISTORY

Structure consulted	Date	Outcome
AES CMC		

SUBMISSION CONTENT

Proposal To implement an interim food security programme in AES
Motivation See attached
Financial implications None
Attachments <ol style="list-style-type: none">1. Proposal to implement an interim food security programme in AES2. Food screening form3. Student/University agreement

Proposal regarding implementation of food security programme in the College of Agriculture, Engineering and Science

PURPOSE

The food security programme is designed to allow financially needy students to have access to support for food insecurity. This includes providing support in the form of food parcels and vouchers to indigent students.

INTRODUCTION

In July 2012 a draft regulatory framework for a food security programme was drafted by the Student Services Division and commented on by various stakeholders. This framework is yet to be finalised. The purpose of this proposal is to suggest an interim way forward for dealing with the issue of food insecurity in the College of Agriculture, Engineering and Science. The responsibility for sourcing the food hampers/vouchers will be that of the Student Services Division as articulated in the draft regulatory framework. The responsibility for disseminating the food hampers/vouchers and accounting for the appropriate use of these hampers/vouchers will be a College function.

ELIGIBILITY

To be eligible a student must be deemed financially needy.

A “financially needy” student shall be defined as a student who meets any of the criteria for funding support by:

- Virtue of being a first entry indigent student in an Access/Foundation programme;
- Having a history with the Registration Appeals Committee (RAC);
- Providing proof that funding has been withdrawn for their current registration but are in debt to the university;
- Having refugee status;
- Providing proof that family support is minimal;
- Other factors as identified by ADOs/Academic leaders/lecturers/financial aid advisors/academic administration/residences and counselling staff in the college.

IMPLEMENTATION PLAN

It is anticipated that the following implementation plan will be most effective:

- Requests for students to be assisted with food parcels/vouchers will come via self-referrals as well as referrals from academic staff, counselling staff, Student Funding, Residences, and SRC and will be directed to the help desk administrators.
- Students will follow office hour procedures to request and collect food parcels/vouchers.

- Students will be screened and assessed by the student counsellor in the College who will verify the financial neediness of the student and screen the student.
- If the student is a therapy client and the counsellor feels conflicted the student may be referred to another counsellor.
- Students will be advised to attend individual/group counselling sessions to assist them with the development of skills in financial management; to address psychological issues; or to deal with any other psychosocial problems which might be affecting them.
- The counsellor will be responsible for issuing the food hampers/vouchers and keeping accurate records of this.
- These records shall be provided to Student Services as requested in order to ensure accountability to the donors.
- The system shall be monitored for effectiveness by the Director of College Professional Services at least every 6 months to ensure the viability and sustainability of the programme. The DCPS shall also report on the programme to the Student Services Board.

APPENDIX C

SURVEY QUESTIONNAIRE

CODE:

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**Food insecurity and related coping strategies among undergraduate students on
Pietermaritzburg campus, University of KwaZulu-Natal**

Dear Participant

Kindly complete the following questionnaire as honestly as possible. Where required, please tick next to the appropriate answer. Please note: There are no right or wrong answers and that the results of this questionnaire will not, in any way be traceable to you in person.

Anthropometry

For office use:

	Height (cm)	Weight (kg)
1.		
2.		
3.		
Average		
BMI	kg/m ²	

Section A: Socio-Demographic information:

1. Gender: 1. Male ☐
 2. Female ☐

2. Age (in years):

3. Race: 1. Black ☐
 2. White ☐
 3. Coloured ☐
 4. Indian ☐
 5. Asian ☐

6. Other (please specify):

4. College: 1. Humanities ☐
 2. Agriculture, Engineering & Science ☐
 3. Law & Management Studies ☐
 4. Health Sciences ☐
5. Academic year:
 1 ☐ 2 ☐ 3 ☐ 4 ☐
6. Do you have a part time job?
 1. Yes ☐ 2. No ☐
 6.1 If yes, please indicate your type of employment:
 1. UKZN-based ☐
 2. Waitron ☐
 3. Sales person ☐
 4. Other (please specify):
7. Have you ever tried to get a part time job?
 1. Yes ☐ 2. No ☐
8. Relationship status: 1. Single ☐
 2. Married ☐
 3. In a relationship ☐
 8.1 If in a relationship, do you live with your partner?
 1. Yes ☐ 2. No ☐
 8.2 Do you receive any financial assistance from your partner?
 1. Yes ☐ 2. No ☐
9. Do you have any children?
 1. Yes ☐ 2. No ☐
 9.1 If yes, please indicate number of children:
 9.2 Do you receive a government child support grant?
 1. Yes ☐ 2. No ☐
 9.3 Does your child live with you?
 1. Yes ☐ 2. No ☐
 9.3.1 If yes, who is the caretaker when you are on campus?

10 Place of residence during term time:

- | | |
|-----------------------------|--------------------------|
| 1. Home | <input type="checkbox"/> |
| 2. Student residence | <input type="checkbox"/> |
| 3. Off-campus accommodation | <input type="checkbox"/> |

11 With reference to Question 10, where is your place of residence situated?

.....
.....

12 Where is the current location where your immediate family lives?

- | | |
|---------------------------------------|--------------------------|
| 1. Suburb in Pietermaritzburg | <input type="checkbox"/> |
| 2. Town outside Pietermaritzburg | <input type="checkbox"/> |
| 3. In town (central Pietermaritzburg) | <input type="checkbox"/> |
| 4. Other (please specify): | |

13 Describe the household your immediate family lives in?

- | | |
|--|--------------------------|
| 1. It is owned by parent/guardian | <input type="checkbox"/> |
| 2. It is rented by parent/guardian | <input type="checkbox"/> |
| 3. It is occupied without payment of a bond or rent, i.e. free of charge | <input type="checkbox"/> |
| 4. They have no permanent residence | <input type="checkbox"/> |

10. How many bedrooms are there in your household where your immediate family live?

.....

11. How many people are there in your household where your immediate family live?

.....

12. What is the source of water in the home where your immediate family live?

- | | |
|-------------------------|--------------------------|
| 1. Tap inside the house | <input type="checkbox"/> |
| 2. Communal tap | <input type="checkbox"/> |
| 3. River | <input type="checkbox"/> |
| 4. Jojo tank | <input type="checkbox"/> |
| 5. Rain water | <input type="checkbox"/> |

Section B: Finance

13. Are you on financial aid or do you receive a bursary?

1. Yes ☐ 2. No ☐

a) If yes, please indicate which financial aid or bursary you are on?

1. NSFAS ☐

2. Government bursary ☐

3. Sponsor ☐

Please name the sponsor:

14. Do you receive an allowance or any additional financial assistance?

1. Yes ☐ 2. No ☐

a) If yes, how much do you receive per month?

1. R100 – 500 ☐

2. R500 – 1000 ☐

3. R1000 – 1500 ☐

4. R1500 – 2000 ☐

5. R2000 – 2500 ☐

6. More than R2500 ☐

b) If yes, where does the allowance or additional financial assistance come from?

1. Parents ☐

2. Guardian ☐

3. Sibling ☐

4. Grandparents ☐

5. Friends ☐

6. Partner ☐

7. Other (please specify):

.....

15. Do you receive money from any government grant?

1. Yes ☐ 2. No ☐

a) If yes please indicate:

1. Child support grant

2. Disability grant

3. Foster child grant

4. Child dependency grant

☐☐☐☐

16. How do you spend your available money on a monthly basis? Please allocate an estimated amount in the boxes below:

1. Rent	<div style="border: 1px solid black; padding: 2px; width: 150px;">R</div>
2. Food	<div style="border: 1px solid black; padding: 2px; width: 150px;">R</div>
2. Social events e.g. movies, parties	<div style="border: 1px solid black; padding: 2px; width: 150px;">R</div>
3. Travelling costs	<div style="border: 1px solid black; padding: 2px; width: 150px;">R</div>
4. Clothes	<div style="border: 1px solid black; padding: 2px; width: 150px;">R</div>
5. Toiletries (e.g. shampoo, deodorant)	<div style="border: 1px solid black; padding: 2px; width: 150px;">R</div>
6. Varsity Extras (e.g. printing credits)	<div style="border: 1px solid black; padding: 2px; width: 150px;">R</div>
7. Alcohol	<div style="border: 1px solid black; padding: 2px; width: 150px;">R</div>
8. Other (please specify):	
.....	

17. Are you experiencing any difficulties obtaining a loan or bursary?

1. Yes ☐ 2. No ☐

a) If yes, please explain:

.....

18. Do you use your loan/bursary/income to assist your family or partner with living expenses?

1. Yes ☐ 2. No ☐

a) If yes, please indicate how much:

1. R0 – 100	<input type="checkbox"/>
2. R100 – 200	<input type="checkbox"/>
3. R200 – 400	<input type="checkbox"/>
4. R400 – 600	<input type="checkbox"/>
5. R600 – 800	<input type="checkbox"/>
6. R800 – 1000	<input type="checkbox"/>
7. More than R1000	<input type="checkbox"/>

19. If you do have a mother, tick the box that best describes your mother's current work situation.

- a) Working full time ☐
- b) Working part time ☐
- c) Unemployed ☐
- d) Retired ☐

20. If you do have a father, tick the box that best describes your father's current work situation.

- a) Working full time ☐
- b) Working part time ☐
- c) Unemployed ☐
- d) Retired ☐

Section C: Food Frequency

21. How often do you eat the following food? (Put an X in the appropriate block)

FOOD ITEM	More than once/day	Once / day	Every second day	2 – 3 times/ week	Once/ week	Rarely	Never
Fresh milk							
UHT/life milk							
Powdered milk							
Coffee creamer (Cremora)							
Cheese e.g. Cheddar							
Maas, yogurt							
Breakfast cereals (Corn Flakes, Pronutro)							
Porridge (mealie meal, phutu, oats)							
Bread							
Rice, mealie rice, samp							
Pasta (macaroni, spaghetti, noodles)							
Potato (baked, mashed, boiled)							
Legumes (lentils, dhol, beans, peas, beans soya mince)							

FOOD ITEM	More than once/day	Once / day	Every second day	2 – 3 times/ week	Once/ week	Rarely	Never
Red meat (pork, beef, mutton)							
Chicken							
Fresh fish							
Frozen fish							
Canned fish (tuna, tin fish)							
Processed meats (ham, polony, viennas, Russians)							
Organ meat (liver, kidneys, tripe)							
Eggs							
Peanut butter							
Fresh vegetables							
Frozen vegetables							
Fresh fruit							
Dried fruit							
Fruit juice							
Fats (sunflower/cooking oil, margarine, butter, mayonnaise)							
Sweets (e.g cakes, biscuits, candy, etc)							
Vetkoek, samoosas, doughnuts							
Muffins, cupcakes, scones, tarts							
Cookies, crunchies, shortbread							
Energy bars (lunch bar)							
Chocolate							
Ice cream							
Salty snacks (eg potato chips, pretzels, corn chips)							
Fizzy drinks & flavoured drinks							
Wine							
Beer & ciders							
Spirits (vodka, whisky, rum)							

FOOD ITEM	More than once/day	Once / day	Every second day	2 – 3 times/ week	Once/ week	Rarely	Never
Cocktails							
Coffee & tea							
Pizza							
Pies & sausage rolls							
Potato chips (French fries)							
KFC, chicken licken							
Nando's							
Karanichas & bunny chows							
Hot dogs							
Honchos							
Burgers (non-branded)							
McDonalds, Steers, Wimpy, Spur							

Section D: Food Security

22. Are you aware that you can obtain a food voucher from Student Counselling?

1. Yes ☐

2. No ☐

a. If yes, have you ever made use of the above assistance?

1. Yes ☐

2. No ☐

23. Does the price of food influence your purchasing decisions?

1. Yes ☐

2. No ☐

24. Do you have time to prepare your own food?

1. Yes ☐

2. No ☐

25. Do you have the facilities to prepare your own food?

1. Yes ☐

2. No ☐

26. Have you ever missed lectures for the following reason/s (you may choose more than one response)

- 1. Hunger ☐
- 2. Too tired due to lack of food ☐
- 3. Feeling of hopelessness ☐
- 4. Lazy ☐
- 5. Apathy ☐

27. Have you ever struggled to concentrate in class due to hunger?

- 1. Yes ☐
- 2. No ☐

28. Usually when hungry, which of the following are the main reason?

- 1. Lack of time for preparation and/or purchase ☐
- 2. Lack of money ☐
- 3. Other (please specify):

.....

29. When have you been most hungry during the course of the semester?

- 1. Beginning of the semester ☐
- 2. End of the semester (close to/during exam time) ☐
- 3. Other (please specify)

.....

30. What time of the day are you most hungry?

- 1. Morning ☐
- 2. Mid-day ☐
- 3. Mid-afternoon ☐
- 4. Evening ☐
- 5. Bedtime ☐

31. If you live in student residence, do you have a secure place to store your food?
(If you do not live in residence, do not answer this question)

- 1. Yes ☐
- 2. No ☐

32. If you live in student residence, has your food ever been stolen?
(If you do not live in residence, do not answer this question)

- 1. Yes ☐
- 2. No ☐

33. What do you do when you do not have food? (you may tick more than one option)

- 1. Borrow food from friends ☐
- 2. Borrow money from friends to buy food ☐
- 3. Borrow money from parents/family to buy food ☐
- 4. Steal food ☐
- 5. Steal other items and sell it to buy food ☐
- 6. Other (please explain)

.....
.....
.....

34. Have you ever sold education-related items such as textbooks or personal belongings to get money for food?

- 1. Yes ☐
- 2. No ☐

38.1 If yes, please specify what you sold

.....
.....

35. Did you feel that you lost weight because there was not enough food to eat?

- 1. Yes ☐
- 2. No ☐

39.1 If yes, please specify how often does it happen

.....

36. Did you feel that you cannot not eat a meal containing a variety of foods because of lack of resources?

- 1. Yes ☐
- 2. No ☐

40.1 If yes, please specify, how often does this happen

.....

37. Individual Food Insecurity Access Scale

For each of the following questions, consider what has happened in the past 30 days. Please answer whether this happened never, rarely (once or twice), sometimes (3 – 10 times) or often (more than 10 times) in the past 30 days?		Never	Rarely	Sometimes	Often
a.	Did you worry that you would not have enough food?				
b.	Were you not able to eat the kinds of foods you prefer because of a lack of resources (money)?				
c.	Did you eat a limited variety of foods due to lack of resources?				
d.	Did you eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?				
e.	Did you have to eat a smaller meal than you felt you needed because there was not enough food?				
f.	Did you have to eat fewer meals per day because there was not enough food?				
g.	Was there ever no food to eat because of lack of resources to obtain more?				
h.	Did you go to sleep hungry at night because there was not enough food?				
i.	Did you go a whole day and night without eating anything because there was not enough food?				

38. Coping behaviours related to food insecurity

In the past week, if there have been times that you did not have enough food or money to buy food, how often have you had to:					
		Daily	Sometimes (3-6 times/week)	Rarely (<1-2 /week)	Never (0/week)
a.	Rely on less preferred and less expensive foods				
b.	Borrow food, or relied on help from a friend or relative				
c.	Purchase food on credit				
d.	Limit portion size at mealtimes				
e.	Reduce number of meals eaten per day				
f.	Skip entire days without eating				
g.	Sell personal belongings to obtain money to buy food				
h.	Steal food				
i.	Steal other items and sell it for food				

Thank you for participating in this study ☺

APPENDIX D

4. Questionnaire Format

Table 4. Household Food Insecurity Access Scale (HFIAS) Measurement Tool

No	Question	Response Options	CODE
1.	In the past four weeks, did you worry that your household would not have enough food?	0 = No (skip to Q2) 1=Yes __
1.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks) __
2.	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	0 = No (skip to Q3) 1=Yes __
2.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks) __
3.	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	0 = No (skip to Q4) 1 = Yes __
3.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks) __
4.	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	0 = No (skip to Q5) 1 = Yes __
4.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks) __

No	Question	Response Options	Code
5.	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	0 = No (skip to Q6) 1 = Yes	... __
5.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	... __
6.	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	0 = No (skip to Q7) 1 = Yes	... __
6.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	... __
7.	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	0 = No (skip to Q8) 1 = Yes	... __
7.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	... __
8.	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	0 = No (skip to Q9) 1 = Yes	... __
8.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	... __
9.	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	0 = No (questionnaire is finished) 1 = Yes	... __

No	Question	Response Options	CODE
9.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks) __

APPENDIX E

PARTICIPANT INFORMATION AND INFORMED CONSENT FORM

Study title:

Food insecurity and related coping strategies among undergraduate students on Pietermaritzburg Campus, University of KwaZulu-Natal.

Dear Student,

You are hereby invited to participate in a study investigating food insecurity among undergraduate students registered for study on the Pietermaritzburg Campus of UKZN in order to determine their coping strategies related to food insecurity. This project is being conducted by an MSc Dietetics student from Dietetics and Human Nutrition, School of Agricultural, Earth and Environmental Sciences. The aims of the study and the procedure that will be followed are as follows:

Study aims:

- To determine the coping strategies adopted by undergraduate students when faced with financial stress and food insecurity.
- To investigate the factors that have an impact on food insecurity-related coping strategies among undergraduate students studying at Pietermaritzburg campus.
- To explore recommendations based on findings during the study that can be implemented in order to assist students faced with financial stress.

Study procedure:

1. Participants will have their height and weight measured by trained the field workers. This information will be required to calculate body mass index (BMI) as weight (kg)/height (m²).
2. Participants will then be asked to complete a self-administered questionnaire anonymously.

Risks:

There are no physical or emotional risks involved in participating in this study. All data collected will be dealt with anonymously as participants will not be required to indicate there name or any other personal details that could be used to trace a particular data set back to a participant. Instead, each participant will be allocated a code. However, should you have any concerns, please feel free to contact the researcher, study supervisor or ethics committee as per the following contact details:

Researcher: Shivani Padmini Poinoosawmy Email: shivane_09@hotmail.com	Human and Social Science Research Ethics Committee (HSSREC): Mrs Mariette Snyman Tel: (031) 260-8350 Fax: (031) 260-3093 Email: snymanm@ukzn.ac.za
Study supervisors: Prof Frederick Veldman Tel: (033) 260-5453 Email: veldmanf@ukzn.ac.za Dr Suna Kassier Tel: (033) 260-5453 Email: kassiers@ukzn.ac.za	

Benefits:

There will be no direct benefits related to participation in the survey. However, by participating in this study you will be making a significant contribution that may benefit other students who face food insecurity.

Duration:

Should you be willing to participate, the completion of the self-administered questionnaire will take approximately 15 minutes and the measurement of the anthropometrics will take approximately 5 minutes.

Findings:

The results of this study will be used towards the completion of an MSc in Dietetics. After completion of the study, participants will be emailed the main findings of the study. This study has been granted ethics approval by the Human and Social Science Research Ethics Committee (see contact details above).

Confidentiality:

All the participants' data will be used solely for the purpose of the study and will not be disclosed to the public. The names of participants will not be used writing up results of the study.

Voluntary participation:

Participation in this study is voluntary and you have the right to withdraw from the study at any time without any adverse outcomes or discrimination.

Should you be willing to participate, please consent by signing the informed consent form below:

INFORMED CONSENT TO PARTICIPATE IN THE STUDY

I, _____ declare that the purpose of the study and methods that will be used for data collection have been explained to me by the researchers/fieldworkers. I fully understand the study aim and what is required from me. In addition, I have been given the opportunity to ask questions. I understand that my participation is voluntary and I may exit from the study at any point should I wish to do so. I am aware that I can contact the researcher at any time should I require clarification regarding the study or its purpose, as well as my rights as a participant.

I hereby consent to voluntary participation in the above mentioned study.

Participant signature: _____

Date: _____