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**Identifying Demographic and Lifestyle Factors Associated with Obesity Among
University of Lusaka Students in Lusaka, Zambia**

BY

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**A research dissertation submitted to the University of Lusaka in partial fulfilment of
the requirements of a Degree in Bachelor of Science in Public Health**

DECLARATION

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I declare that this proposal is my creative work and to the best of my acquaintance has not been presented for a degree in any other institution.

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DEDICATION

This research project is dedicated to my parents, whose sacrifices, love, and constant encouragement have been the foundation of my success. You have always believed in me, even when I doubted myself. Your words of wisdom and faith in education continue to inspire me every single day.

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LIST OF ACRONYMS

1. **ACHA:** American College Health Association
2. **BMI:** Body Mass Index
3. **FPC:** Finite Population Correction
4. **LMICs:** Low- and middle-income countries
5. **NCDs:** Non-communicable diseases
6. **SEM:** Social Ecological Model
7. **SES:** Socioeconomic status
8. **UNILUS:** University of Lusaka
9. **WHO:** World Health Organization

ABSTRACT

Introduction

Obesity is a growing public health concern among young adults in Zambia, particularly within university settings. This study investigated demographic and lifestyle factors associated with obesity among students at the University of Lusaka (UNILUS).

Methodology

A quantitative cross-sectional study involving **373 students** was conducted using stratified random sampling. Data were collected using structured questionnaires and anthropometric measurements. Analysis was performed in STATA using descriptive statistics, chi-square tests, and multivariate logistic regression at a significance level of **$p < 0.05$** .

Results

The prevalence of **obesity was 22.25%**, and **55.23%** of students were either overweight or obese. High fast-food consumption showed a significant association with obesity ($\chi^2 = 7.49$, $p = 0.006$). Logistic regression revealed that students who consumed fast food ≥ 5 times per week had **2.46 times higher odds** of obesity (95% CI: 1.21–5.00, $p = 0.013$). Sleeping **7–8 hours** per night reduced the odds of obesity by **45%** (OR = 0.55, 95% CI: 0.30–0.98, $p = 0.044$). Demographic factors including gender, SES, and residence were not significant predictors in the adjusted model.

Conclusion

Obesity among UNILUS students is substantially high at **22.25%**, answering the first research question. The study further demonstrates that **frequent fast-food consumption is the strongest behavioural determinant**, with students consuming fast food ≥ 5 times per week having **more than twice the odds of being obese**. Adequate sleep (7–8 hours) was a significant protective factor. Overall, **modifiable lifestyle behaviours** rather than demographic characteristics are the primary contributors to obesity in this population.

Recommendations

The university should prioritise interventions addressing fast-food intake, sleep hygiene, and campus nutritional environments. Future research should adopt longitudinal designs to better establish causal pathways.

CHAPTER ONE

1.0 BACKGROUND/INTRODUCTION

Obesity has emerged as a significant public health challenge globally, with its prevalence steadily rising in both developed and developing countries, including Zambia. Among young adults, particularly university students, this condition is increasingly common due to shifts in lifestyle, dietary habits, and reduced physical activity (Ng et al., 2014). At the University of Lusaka (UNILUS), anecdotal observations suggest a growing number of students may be grappling with obesity, yet little is known about the specific demographic and lifestyle factors contributing to this trend. This lack of understanding hinders the development of targeted interventions to address the issue, which could have long-term implications for students' health, academic performance, and overall well-being.

The importance of addressing obesity among university students cannot be overstated. Obesity is linked to numerous health complications, including diabetes, hypertension, and cardiovascular diseases, which can reduce quality of life and increase healthcare costs (World Health Organization, 2021). For students, excess weight may also affect self-esteem, mental health, and academic productivity, creating a ripple effect on their future prospects (El Ansari, Stock and Mikolajczyk, 2012). In Zambia, where non-communicable diseases (NCDs) are on the rise, understanding obesity in this population is critical to shaping preventive health policies and promoting healthier lifestyles among the youth (Ministry of Health Zambia, 2019).

To investigate this issue, this study adopted a quantitative approach, collecting data through surveys from a sample of UNILUS students. The research explored demographic factors such as age, gender, and socioeconomic status, alongside lifestyle factors like dietary habits, physical activity levels, and sleep patterns. By analysing these variables, the study aims to identify key contributors to obesity within this specific population. The findings could inform university health programs, guide policy recommendations, and contribute to broader efforts to combat obesity in Zambia.

The potential benefits of this study are manifold. It provides evidence to support the design of tailored health interventions for UNILUS students, such as nutrition education or fitness initiatives. Additionally, it may raise awareness among students and administrators about the

importance of addressing obesity, fostering a culture of wellness on campus. On a larger scale, the study could contribute to the limited body of research on obesity in Zambian youth, offering insights applicable to other universities and young adult populations (Kaunda and Mkandawire, 2022).

Therefore, this study intended to identify the demographic and lifestyle factors associated with obesity among University of Lusaka students in Lusaka, Zambia, to provide actionable insights for health promotion and obesity prevention.

1.1 STATEMENT OF THE PROBLEM

In an ideal scenario, university students, as young and active individuals, are expected to maintain healthy body weights due to their access to education, structured routines, and opportunities for physical activity. However, this is not always the case. Globally, studies indicate that university students are increasingly prone to obesity due to sedentary behaviours, poor dietary choices, and stress-related factors. In Zambia, the World Health Organization (WHO) reported that the prevalence of overweight and obesity among adults rose from 13.2% in 2000 to 18.6% in 2016, signalling a growing public health concern. While specific data for Zambian university students is scarce, observations at the University of Lusaka suggest that many students exhibit higher-than-normal body weights, potentially deviating from the expected norm for their age group.

This deviation raises a critical issue: the factors driving obesity among UNILUS students remain unidentified. Without understanding whether demographic characteristics (e.g., gender or income) or lifestyle choices (e.g., fast food consumption or inactivity) are primarily responsible, efforts to address the problem remain speculative and ineffective. For instance, preliminary discussions with students indicate that access to affordable, unhealthy food options near campus and limited time for exercise may play a role, yet no systematic investigation has confirmed these influences. This gap in knowledge represents a problem worth investigating, as it impedes the ability to curb a preventable condition with serious health and social consequences.

1.2 JUSTIFICATION OF THE STUDY

This study adds to the body of academic knowledge by addressing a critical gap in understanding obesity within a specific Zambian context. This study aims to examine the increasing prevalence of obesity in Zambia, with a particular focus on the scarcity of

localized data concerning university students. By exploring the factors contributing to obesity among students at the University of Lusaka (UNILUS), this research seeks to generate valuable insights that could inform the development of targeted interventions. These interventions have the potential to enhance student health outcomes while also contributing to broader national strategies for combating non-communicable diseases.

1.3 GENERAL RESEARCH OBJECTIVE

To identify the demographic and lifestyle factors associated with obesity among University of Lusaka students in Lusaka, Zambia.

1.4 SPECIFIC RESEARCH OBJECTIVES

1. To determine the prevalence of obesity among UNILUS students.
2. To examine the influence of demographic factors (e.g., age, gender, socioeconomic status, location) on obesity.
3. To assess the role of lifestyle factors (e.g., diet, physical activity, sleep) in obesity among students.

1.5 RESEARCH QUESTIONS

1. What is the prevalence of obesity among UNILUS students?
2. How do demographic factors such as age, gender, and income influence obesity rates?
3. What lifestyle factors are most strongly associated with obesity in this population?

CHAPTER TWO

LITERATURE REVIEW

GLOBAL TRENDS IN OBESITY AMONG UNIVERSITY STUDENTS

Globally, university students are experiencing rising rates of overweight and obesity. Recent studies suggest that roughly one-quarter of students have excess weight. For example, a survey of 22 universities across various countries found about 19% of male students and 14% of female students were overweight, and about 6% were obese (Mouodi et al., 2021). A systematic review of medical students worldwide similarly estimated 18% were overweight and 9% obese (Sabreen et al., 2021). These figures reflect broader global trends: obesity prevalence has more than doubled in many regions over the past few decades, threatening public health. In practice, many students adopt unhealthy habits after entering university. In the United States, college students generally fail to meet dietary and physical activity guidelines, and the average student gains 1.6–3.0 kg during four years on campus (American College Health Association [ACHA], 2018). Correspondingly, one US survey reported about 24% of students were overweight and 16% obese (ACHA, 2018). These patterns – a substantial minority of students with high BMI and ongoing weight gain during college – have been observed across diverse settings.

Numerous studies highlight that this trend is linked to lifestyle changes common in university life. Campuses often provide easy access to high-calorie foods and less requirement for physical activity. For example, living off-campus (with less oversight of diet) has been associated with worse diet quality and higher obesity risk (Small et al., 2013). Conversely, interventions that improve campus food environments (like calorie labeling or healthy-marketing campaigns) can help. Overall, the transition to university is a vulnerable period when young people may fall into sedentary patterns and calorie-rich diets, contributing to the global rise in student obesity.

Regional context in Africa and Zambia Obesity is also increasing among African youth, including students. A recent review reported an average overweight prevalence of about 19–20% among African university students (range 6–53% across studies), and about 6% obesity (Mogre et al., 2021). The highest student obesity rates were still much lower than in Western countries (e.g. up to ~22% vs 44% in one US sample) (Mogre et al., 2021). These shifts are driven by rapid urbanization and nutrition transitions: many African countries have seen diets

become more "Western" (high in fats, sugars and processed foods) and lifestyles more sedentary (Popkin et al., 2020). For instance, one review notes that poor diet, frequent snacking and low physical activity – all linked to urban living – underlie the rising obesity in African students (Mogre et al., 2021). Targeted health programs and policies have been recommended to address this emerging problem in African universities.

Data specific to Zambia are sparse, but general trends signal concern. In Zambia's population, national surveys and studies show rising overweight and obesity rates, especially among women. A 2017 national WHO STEPS survey of adults (ages 18–69) found 16.7% were overweight and 7.5% obese (WHO, 2017). A Lusaka district study similarly reported 14.2% obesity overall, with 18.6% of adult women obese versus only 5.1% of men (Phiri et al., 2021). In rural Zambia, one community survey found 26.8% of adults (aged 25–64) had BMI ≥ 25 (overweight or obese) (Kalyesubula et al., 2020). These figures suggest a growing double burden: undernutrition persists in some groups, but overweight is rising among urban and educated populations.

Unfortunately, almost no published data focus on Zambian university students specifically. A few local reports (not always peer-reviewed) hint at high rates of overweight in tertiary students, but we lack rigorous, national-level studies. It is reasonable to suspect that Zambian students share risk factors with other African students – urbanized lifestyles, Western diets, and limited exercise – and may face similar overweight prevalence (perhaps 15–30%). Nonetheless, the exact magnitude among Zambian students remains unknown and is an important knowledge gap.

Demographic factors

Age. Among young adults, even small age differences can matter. Students in the later years of university (in their early-to-mid 20s) often have higher BMI than first-year students, reflecting the tendency for weight to increase with age in adulthood. For example, studies in Zambia and elsewhere find older age groups have higher obesity risk (Kalyesubula et al., 2020; Phiri et al., 2021). For university settings, this implies that final-year students may be at higher risk than freshmen.

Gender. Patterns by sex vary by context. Globally, some studies find male students slightly more overweight (possibly reflecting differences in muscle mass and dietary habits), while

female students sometimes exhibit higher obesity or body-fat percentages. For example, a worldwide analysis of medical students reported higher overweight/obesity rates in males than females (Sabreen et al., 2021). In the U.S., male college students have tended to have more overweight/obesity than females (ACHA, 2018). By contrast, in Zambia general populations, women bear most of the obesity burden: one Lusaka survey found obese women (18.6%) outnumbered obese men (5.1%) (Phiri et al., 2021). This reflects social and biological factors: Zambian women of higher socioeconomic status were far more likely to be obese than men (Phiri et al., 2021; Kalyesubula et al., 2020).

Socioeconomic status (SES). SES and education level are important predictors. In high-income countries, lower-SES groups tend to have higher obesity. But in many low- and middle-income countries (LMICs), obesity is linked to wealth and education. Zambian evidence illustrates this: adults with university education had higher odds of obesity than less-educated peers (Kalyesubula et al., 2020). In the rural Zambian study, having tertiary education (a proxy for higher SES) was associated with overweight/obesity (Kalyesubula et al., 2020). Likewise, female students from wealthier families likely have more disposable income for calorie-rich foods and may be less physically active, increasing their risk.

Lifestyle factors Obesity is fundamentally driven by lifestyle behaviours. In university students, key factors include diet, physical activity, and sleep.

Diet. University life often leads to unhealthier eating. Busy students may skip breakfast, eat irregular meals, and rely on fast food or campus cafeterias. Many students worldwide fail to meet dietary guidelines. For example, a review notes most college students do not consume adequate fruits and vegetables, and often exceed recommended caloric intake (Small et al., 2013). In African settings, the nutrition transition means students increasingly consume processed and high-fat foods (Mogre et al., 2021). In practical terms, Zambian students may face similar influences: easy access to sugary drinks, fried street foods, and snack aisles on campus can promote weight gain.

Physical activity. Most college students are not very active. Research consistently finds students below the recommended 150 minutes of moderate-to-vigorous activity per week. The campus environment often encourages sedentary behaviour. African studies similarly report low exercise levels among students. Sedentary time has been associated with higher

BMI in students. In Zambia specifically, male students often engage in more vigorous physical activity than females (Phiri et al., 2021).

Sleep. Growing evidence links sleep and obesity even in young adults. College students often have erratic sleep schedules. Studies of students in the US and Korea found that those who are obese are more likely to have inadequate sleep (Sabreen et al., 2021). Poor sleep can disrupt hormones that regulate appetite, leading to increased hunger and weight gain.

Other lifestyle factors include alcohol and substance use. Heavy drinking adds calories and can impair judgment about food choices. Some surveys show that frequent alcohol consumption among students is linked to higher BMI. In Zambia, alcohol is common on campuses, and hazardous drinking among students is reported. Interestingly, smoking prevalence among students is relatively low.

Summary of key findings and knowledge gaps

- Prevalence among students: Globally, about 20–30% of university students are overweight or obese (Mouodi et al., 2021; Sabreen et al., 2021). In Africa, studies report roughly 19% overweight and 6% obese in student samples (Mogre et al., 2021). No reliable figure exists for Zambian university students.
- Zambia context: Limited data indicate rising obesity, especially in women. National surveys found ~17% of Zambian adults overweight and 7.5% obese (WHO, 2017).
- Risk factors: Age, gender, and SES influence obesity. Higher education and income usually correlate with obesity in LMICs (Kalyesubula et al., 2020).
- Health impacts: Obesity in students affects not only physical health but also mental health and academic performance.
- Knowledge gaps: No large-scale study has reported BMI trends across Zambia's universities. Key gaps include prevalence, diet and activity patterns, campus environment influences, cultural attitudes, and intervention trials.

2.1 THEORETICAL REVIEW

This study is grounded in the Social Ecological Model (SEM), a framework that provides a comprehensive lens for understanding the multifaceted influences on obesity among university students. Developed by Bronfenbrenner (1979) and adapted for health behaviours by McLeroy et al. (1988), the SEM posits that individual health outcomes, such as obesity, are shaped by interactions across multiple levels: intrapersonal (e.g., knowledge, attitudes), interpersonal (e.g., social norms), community (e.g., campus environment), and societal (e.g., economic and policy factors). This model is suitable for this quantitative study as it considers both individual-level factors (e.g., age, gender, personal habits) and broader environmental factors (e.g., campus facilities, societal norms) that contribute to obesity among UNILUS students.

At the intrapersonal level, individual choices about diet and exercise directly influence body weight, as supported by research linking personal habits to obesity (Nelson et al., 2008; Taheri et al., 2004). The interpersonal level examines how peer influence and social norms on campus might affect students' eating and activity patterns (Wardle et al., 2002). The community level encompasses the physical and social environment of UNILUS, such as the availability of affordable food options and recreational facilities, which can contribute to obesogenic environments (Keating et al., 2005). Finally, the societal level incorporates broader Zambian trends, including urbanization and economic disparities, which shape the context for students' health decisions (Chigumbele et al., 2018; Drewnowski and Specter, 2004). The SEM's application is reinforced by its use in similar contexts, such as Dancy et al. (2018), who explored obesity among African American women, and Sallis et al. (2009), who recommended it for environmental and policy research on obesity. By employing the SEM, this study provides a holistic framework to interpret the quantitative data collected from UNILUS students.

2.2 CONCEPTUAL FRAMEWORK

This conceptual framework outlines the relationship between independent variables (demographic and lifestyle factors) and the dependent variable (obesity among UNILUS students), measured using Body Mass Index (BMI). The framework is tailored to this quantitative study and is structured as follows:

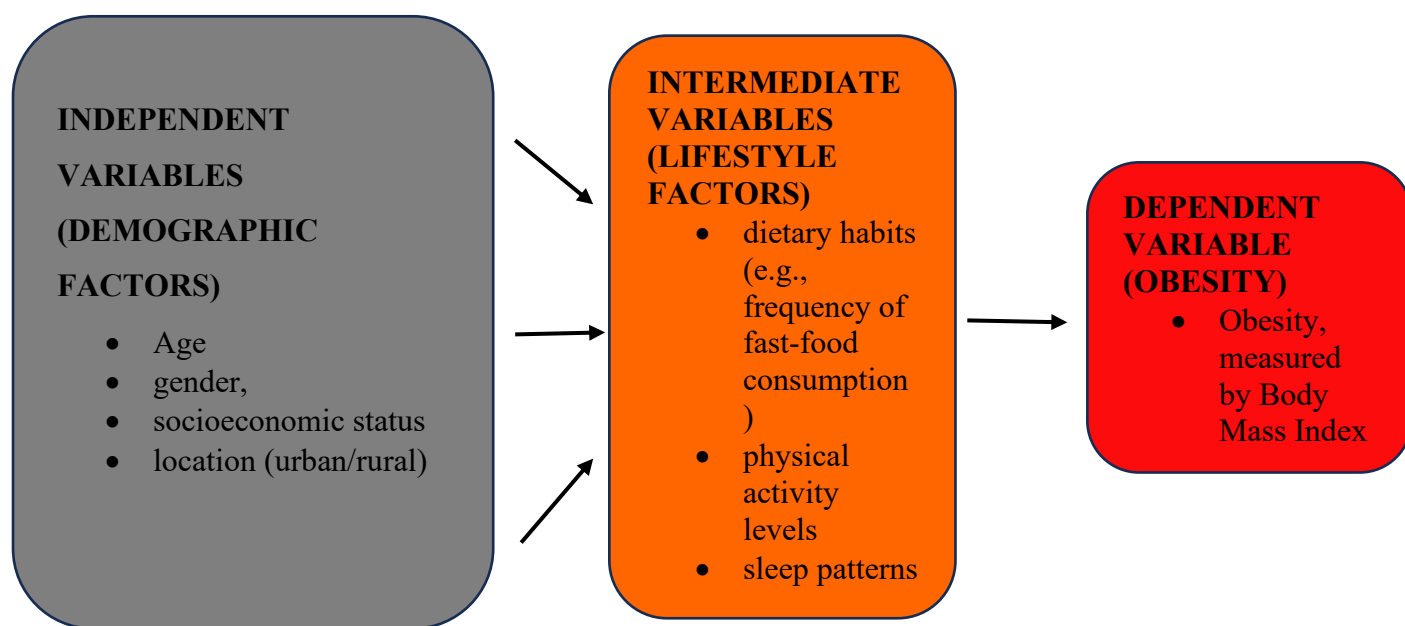


Figure 1: This conceptual framework illustrates how demographic factors (age, gender, socioeconomic status, and location) influence lifestyle behaviours (diet, physical activity, and sleep patterns), which in turn affect obesity measured by BMI (**Source:** Author).

The framework assumes that demographic and lifestyle factors directly influence obesity. For instance, gender may affect dietary preferences or societal pressures, with females potentially more prone to weight gain (Wardle et al., 2002). Socioeconomic status influences access to food types, with higher income linked to calorie-dense foods or healthier options depending on context (Drewnowski and Specter, 2004), while location reflects exposure to urbanized, obesogenic environments (Chigumbele et al., 2018). Lifestyle factors impact energy balance: fast food consumption drives weight gain (Nelson et al., 2008), physical inactivity exacerbates it (Keating et al., 2005), and inadequate sleep increases obesity risk through hormonal mechanisms (Taheri et al., 2004). The campus environment (e.g., food availability, recreational facilities) is a constant factor across participants but may moderate these relationships. These interactions will be tested through surveys and BMI measurements, aligning with the study's objectives to determine prevalence and identify key contributors. A diagram (to be included in the final document) would depict arrows from demographic and lifestyle factors to obesity, with the campus environment as a moderating layer, guided by the SEM.

CHAPTER THREE

3.0 METHODOLOGY

This chapter outlines the methodology that will guide the study on the demographic and lifestyle factors associated with obesity among students at the University of Lusaka (UNILUS). It explains the research approach, study design, population, sampling procedures, data collection methods, data analysis techniques, and ethical considerations. The structure is intended to ensure clarity, consistency, and scientific rigor in the execution of the research (Creswell, 2014).

3.1 STUDY APPROACH

A **quantitative research approach** was adopted for this study. This approach is appropriate as it allows for the collection and analysis of numerical data, which is essential in determining the prevalence of obesity and its associations with demographic and lifestyle factors such as age, gender, diet, and physical activity. Quantitative methods support objective measurement and enable the researcher to draw conclusions that can be generalized to the larger student population (Bryman, 2016).

3.2 STUDY DESIGN

The study utilized a **cross-sectional design**. This design is suitable for investigating the prevalence of obesity and associated factors at a single point in time. It allows for the efficient collection of data from a large number of participants and is useful for identifying patterns and correlations among variables in a defined population (Levin, 2006).

3.3 STUDY POPULATION

The target population for this study comprises undergraduate students currently enrolled at the University of Lusaka. Students from all faculties and academic years, both male and female, will be included. This diverse representation ensured that the findings reflect a broad range of student experiences and health profiles (Polit & Beck, 2017).

3.4 SAMPLE SIZE AND SAMPLING PROCEDURES

The sample size was calculated using **Cochran's formula**, which is designed to produce a sample that accurately reflects the target population while maintaining statistical validity (Cochran, 1977).

To ensure that students from different faculties and academic levels are proportionately represented, a **stratified random sampling method** will be employed. This technique helps reduce sampling bias and improves the representativeness of the sample, thereby enhancing the reliability of the results (Kumar, 2019).

Sample Size Determination for the Total UNILUS Population

To estimate the appropriate sample size for the entire UNILUS student population, Cochran's formula was applied. The total number of students enrolled across all three UNILUS campuses is approximately 13,000. This includes both undergraduate and postgraduate students.

Cochran's formula for sample size determination is as follows:

$$n_0 = (Z^2 \times p \times (1 - p)) / e^2$$

Where:

- n_0 = sample size for an infinite population
- ZZ = standard normal deviation (1.96 for a 95% confidence level)
- pp = estimated proportion of the population (assumed to be 0.5 for maximum variability)
- ee = margin of error (0.05 or 5%)

Substituting the values:

$$n_0 = (1.96^2 \times 0.5 \times (1 - 0.5)) / 0.05^2$$

$$n_0 = (3.8416 \times 0.25) / 0.0025$$

$$n_0 = 0.9604 / 0.0025$$

$$n_0 = 384.16$$

Given that the target population is finite ($N = 13,000$), the sample size was adjusted using the finite population correction (FPC) formula:

$$n = n_0 / (1 + ((n_0 - 1) / N))$$

$$n = 384.16 / (1 + ((384.16 - 1) / 13,000))$$

$$n = 384.16 / (1 + (383.16 / 13,000))$$

$$n = 384.16 / (1 + 0.0295)$$

$$n = 384.16 / 1.0295$$

$$n \approx 373$$

Therefore, the final sample size required to represent the entire UNILUS student population was approximately 373 students.

3.5 Data Collection Methods

Data were collected using one main method:

1. **Structured Questionnaire:** A self-administered questionnaire was used to gather data on demographic characteristics (such as age, gender, and socioeconomic status) and lifestyle factors (including dietary habits, physical activity levels, and sleep patterns). The questionnaire included both closed-ended and multiple-choice questions and was distributed both online and in person to maximize reach and participation (Bowling, 2005).

3.6 Data Analysis Methods

Data analysis was carried out using STATA software. The analysis included both descriptive and inferential statistics:

- **Descriptive statistics** (such as frequencies, means, and standard deviations) were used to summarise the characteristics of the study population and the prevalence of obesity.
- **Inferential statistics** were used to examine associations between obesity and the independent variables:
 - Chi-square tests were used to assess relationships between categorical variables (e.g., gender and obesity status).

- ANOVA was used to compare mean differences across various demographic or lifestyle categories.

A **p-value** of less than **0.05** was considered statistically significant (Field, 2013).

3.7 Ethical Considerations

Ethical approval for the study was obtained from the University of Lusaka Research Ethics Committee. All participants were informed about the purpose and procedures of the study and were asked to provide written informed consent prior to participation. The following ethical principles were strictly observed:

Autonomy: Participation was voluntary, and students were free to withdraw from the study at any point without any consequences.

Confidentiality and Anonymity: No personal identifiers were collected. All data were anonymised and securely stored, with access restricted to the researcher.

Beneficence and Non-maleficence: The study was conducted in a manner that ensured no harm to participants and aimed to contribute to improved health understanding and outcomes.

Academic Integrity: All data collected were used exclusively for academic purposes, and findings were reported honestly and transparently.

CHAPTER 4: RESULTS

4.1 INTRODUCTION

This chapter presents the findings from the analysis of data collected from n=373 students at the University of Lusaka (UNILUS). The analysis was conducted using STATA software and addresses the study's specific objectives: to determine the prevalence of obesity, and to examine the influence of demographic and lifestyle factors on Obesity Status. The results are presented in three sections: descriptive statistics, bivariate analysis (Chi-Squared), and multivariate analysis (Logistic Regression).

4.1.1 DESCRIPTIVE CHARACTERISTICS AND PREVALENCE OF OBESITY

The final sample size was **373** students, consistent with the calculation for the UNILUS student population.

The demographic profile of the participants included **61.7% Female** (n=230) and **38.3% Male** (n=143), with a mean age of **23.82 ±3.66 years**.

The primary objective to determine the prevalence of obesity found that **22.25%** of the UNILUS student population were classified as Obese (BMI ≥ 30). Furthermore, an additional 32.98% were Overweight, totalling **55.23%** of students classified as having excess weight (Overweight or Obese). The detailed distribution of the study participants by Body Mass Index (BMI) classification is presented in Table 4.1 below.

Table 1: Distribution of Study Participants by BMI Status

BMI Classification	Definition (kg/m ²)	Frequency (n)	Percentage (%)
Underweight	< 18.5	15	4.02
Normal Weight	18.5 - 24.9	152	40.75
Overweight	25.0 - 29.9	123	32.98
Obese	≥ 30.0	83	22.25
Total		373	100.00

Regarding key lifestyle factors:

- **High Fast-Food Consumption (FFC): 11.0%** (n=41) of students reported high FFC (5 or more times per week).
- **Optimal Sleep: 50.7%** (n=189) of students reported sleeping 7-8 hours per night on weekdays.
- **Physical Activity: 15.8%** (n=59) of students were classified as physically inactive (0 days of activity).

4.2 Bivariate Analysis (Chi-Squared Test of Association)

Chi-Squared tests were performed to examine the unadjusted association between each categorical independent variable and the binary outcome, Obesity Status (Obese vs. Not Obese). Results are summarized in Table 4.2.

Table 2: Summary of Bivariate Chi-Squared Test Results for Association with Obesity Status

Variable	Chi-Squared (chi ²)	Degrees of Freedom (df)	p- value	Association Status
High Fast-Food Consumption (FFC)	7.4901	1	0.006	Significant
Socioeconomic Status (SES)	5.1923	2	0.075	Marginal
Sleep Hours Weekdays	3.7010	3	0.296	Not Significant
Alcohol Consumption	5.0030	4	0.287	Not Significant
Gender	1.1451	1	0.285	Not Significant
Physical Inactivity	0.1483	1	0.700	Not Significant
Residence	0.1036	1	0.748	Not Significant
High Sugary Drinks Consumption (SDC)	0.0094	1	0.923	Not Significant

The bivariate analysis identified that only **High Fast-Food Consumption** showed a statistically significant unadjusted association with Obesity Status ($\chi^2(1) = 7.4901$, $p = 0.006$). **Socioeconomic Status (SES)** showed a marginal association ($\chi^2(2) = 5.1923$, $p = 0.075$). All other demographic and lifestyle factors were not significantly associated with Obesity Status in the unadjusted model.

4.3 Multivariate Analysis (Logistic Regression)

Multivariate logistic regression was employed to assess the simultaneous, independent influence of all factors on the odds of being Obese, thereby addressing **Research Question 3**: What lifestyle factors are most strongly associated with obesity in this population?

The overall model fit was evaluated as marginal ($LR \chi^2(14) = 21.54, p = 0.0885$), indicating that while the model is statistically meaningful, a large proportion of variance in obesity status is still explained by unmeasured factors.

Table 3: Multivariate Logistic Regression Predicting Odds of Obesity (Adjusted ORs)

Variable	Reference Group	Adjusted Odds Ratio (OR)	95% Conf. Interval	p-value
High FFC	Low FFC	2.46	(1.21, 5.00)	0.013
7-8 hours Sleep	5-6 hours	0.55	(0.30, 0.98)	0.044
Middle income (SES)	High income	1.89	(0.95, 3.76)	0.071
Once a week (Alcohol)	1-3 times/month	2.13	(0.86, 5.29)	0.102
Less than once/month (Alcohol)	1-3 times/month	1.05	(0.47, 2.35)	0.905
Male (Gender)	Female	1.27	(0.75, 2.13)	0.368
Low income (SES)	High income	1.13	(0.53, 2.44)	0.752
On campus (Residence)	Off campus	1.09	(0.66, 1.83)	0.730
High SDC	Low SDC	1.06	(0.45, 2.48)	0.897
Inactive (Physical Activity)	Active	0.96	(0.47, 1.96)	0.903
More than 8 hours (Sleep)	5-6 hours	0.61	(0.24, 1.53)	0.290
Less than 5 hours (Sleep)	5-6 hours	0.75	(0.32, 1.78)	0.516
Never (Alcohol)	1-3 times/month	1.03	(0.47, 2.24)	0.945

Multiple times/week	1-3	0.57	(0.14, 2.35)	0.436
(Alcohol)	times/month			

(Statistically significant at $p < 0.05$)

Key Findings:

1. **High Fast-Food Consumption (FFC):** This was the strongest independent predictor of obesity (OR = 2.46, $p = 0.013$). Controlling for all other variables, students reporting **High FFC** had **2.46 times the odds** of being obese compared to those with low FFC.
2. **Optimal Sleep Duration (7-8 hours):** Reporting **7-8 hours of sleep** per night was a statistically significant protective factor (OR = 0.55, $p = 0.044$). Students in this optimal sleep range had **45% lower odds** of being obese compared to the reference group (5-6 hours of sleep).

CHAPTER 5: DISCUSSION

5.1 INTRODUCTION

This chapter interprets the results of the UNILUS obesity study by relating the findings to the conceptual framework, the Social Ecological Model (SEM), and the existing literature on young adults in Low- and Middle-Income Countries (LMICs). The discussion focuses on addressing the research objectives this study research objectives.

5.2 DISCUSSION OF SPECIFIC RESEARCH OBJECTIVES

5.2.1 Prevalence of Obesity (Objective 1)

The calculated prevalence of **Obesity (BMI $\geq$ 30)** was **22.25%** among UNILUS students. This finding confirms the premise of the problem statement and highlights the severity of the issue within the university context. Critically, this figure is nearly **three times higher** than the estimated 7.5% national average for general Zambian adults reported by WHO (2017).

This disproportionately high rate is characteristic of populations undergoing rapid **nutrition and lifestyle transitions**. University students, often financially independent and with easy access to urbanized, sedentary lifestyles and readily available fast-food options, frequently exhibit elevated rates of overweight and obesity compared to the general population in LMICs (Mogre et al., 2021). The overall prevalence of excess weight (Overweight and Obese) at 55.23% further establishes that obesity is a significant public health issue requiring targeted attention at UNILUS.

5.2.2 The Independent Role of Lifestyle Factors (Objective 3)

The multivariate analysis provided a clear answer regarding the most strongly associated lifestyle factors, highlighting the independent roles of **Fast-Food Consumption** and **Sleep Duration**.

Fast Food Consumption (FFC): The Dominant Behavioural Risk Factor

The finding that **High FFC** increases the odds of obesity by 2.46 times, independent of other variables, is the most crucial result.

- **SEM Interpretation (Intrapersonal & Community Levels):** This factor operates primarily at the **Intrapersonal level** (personal choice) but is heavily influenced by the **Community level** (campus environment) as outlined in the conceptual framework. The availability of affordable, high-calorie food options near the UNILUS campus likely facilitates this behaviour, driving the chronic positive energy balance necessary for weight gain [Drewnowski and Specter, 2004].
- **Contextual Relevance:** This finding aligns with the literature on **nutrition transitions** in LMICs, where increased urbanization and accessibility to processed, energy-dense foods (often fast food) replace traditional diets, leading to rising NCD burdens (Popkin et al., 2020).

Optimal Sleep Duration: A Protective Mechanism

The finding that sleeping **7-8 hours** per night is a protective factor (OR = 0.55) supports the biological relationship between sleep and metabolic health.

- **Physiological Alignment:** This result is consistent with studies that link chronic sleep restriction (which characterizes the reference group of 5-6 hours) to hormonal dysregulation, particularly increases in the appetite-stimulating hormone ghrelin and decreases in the satiety hormone leptin [Taheri et al., 2004].
- **SEM Interpretation (Intrapersonal Level):** While campus stress may restrict sleep, the decision to prioritize 7-8 hours is an **Intrapersonal** behavioural choice that independently mitigates the risk posed by factors like poor diet. This highlights the importance of student education on sleep hygiene.

5.2.3 The Non-Significant Role of Demographic Factors (Objective 2)

Contrary to some Zambian general population studies (Phiri et al., 2021; Kalyesubula et al., 2020) which found strong associations with gender and SES, these demographic variables were **not** significant predictors of obesity in the adjusted UNILUS student model.

- **Gender and SES:** The lack of significance for gender and SES (low income) suggests that the influence of these distal factors may be **fully mediated** by the stronger, proximal behavioural factors in the student population. For instance, the higher odds associated with being female or having higher SES may be largely

explained by their specific patterns of FFC and sleep, which were already controlled for in the logistic regression.

- **Physical Inactivity:** The finding that physical inactivity was non-significant (OR = 0.96) likely reflects the **crude measurement** of this variable. The binary nature of the physical inactivity measure failed to capture the intensity, frequency, or duration of activity, which are necessary to detect a reliable effect on energy expenditure and weight status.

5.3 Limitations and Strengths

5.3.1 Limitations

1. **Cross-Sectional Design:**

The use of a cross-sectional study design limited the ability to establish causality. Although associations were identified, the study could not determine the direction of the relationships. For example, it remains unclear whether obesity contributed to poor sleep patterns or whether inadequate sleep increased the risk of obesity.

2. **Measurement Error:**

The study relied heavily on self-reported data for height, weight, dietary behaviours, and physical activity. Such measures are prone to recall bias and social desirability bias, which may result in underreporting or overreporting of behaviours. This could affect the accuracy of BMI calculations and the classification of lifestyle factors.

3. **Model Limitations:**

The marginal overall model fit suggests that key variables influencing obesity may not have been captured. Important unmeasured confounders such as genetic predisposition, mental health status, academic stress levels, alcohol consumption, or detailed micronutrient intake could have influenced the observed outcomes.

4. **Sampling Constraints:**

Although the sample was adequate, it may not fully represent all subgroups within the UNILUS student population, particularly those from smaller faculties or part-time students who may have different lifestyle patterns.

5. **Temporal Factors Not Captured:**

Lifestyle behaviours such as diet and physical activity can vary significantly during exam periods or holidays. Because data were collected at a single point in time, the study could not capture seasonal or temporal variations that might affect obesity risk.

5.3.2 Strengths

1. Localized and Context-Specific Evidence:

The study fills a critical knowledge gap by providing robust, contextually relevant data on obesity among university students in Zambia an area with limited published research. This evidence directly supports institutional planning, health promotion, and targeted interventions within UNILUS.

2. Use of a Multivariate Analytical Approach:

The application of logistic regression allowed for the isolation of independent effects of fast-food consumption (FFC) and sleep patterns on obesity. This strengthened the validity of findings by controlling for confounding variables and identifying clear behavioural targets for intervention.

3. Large and Diverse Sample:

A relatively large sample size enhanced the statistical power of the analysis and increased the reliability of the findings. The inclusion of students from various schools and programmes improved representativeness.

4. Structured Measurement Framework:

The study was guided by a well-defined conceptual framework grounded in demographic and lifestyle factors. This strengthened internal validity and provided coherence between research questions, methods, and interpretation of results.

5. Practical Relevance:

The findings have direct applicability for university health services, policymakers, and student support systems. Identifying modifiable behavioural factors offers a foundation for targeted obesity prevention strategies and health education initiatives.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

This study successfully achieved its general research objective of identifying the demographic and lifestyle factors associated with obesity among University of Lusaka students.

The findings confirm that obesity is a pertinent public health concern at UNILUS. The statistical analysis provides two definitive conclusions to inform intervention design:

1. **High Fast-Food Consumption** is the single strongest behavioural risk factor for obesity among UNILUS students, increasing the odds of the condition by almost 2.5 times.
2. **Optimal sleep duration (7-8 hours)** acts as a significant protective factor, highlighting the importance of metabolic regulation through healthy sleep hygiene.

6.2 RECOMMENDATIONS

Based on the evidence and grounded in the **Social Ecological Model (SEM)**, recommendations are made at multiple levels to address the obesogenic environment and individual behaviours at the University of Lusaka.

6.2.1 Institutional and Community Level Recommendations (UNILUS Administration)

1. **Campus Food Policy:** The UNILUS administration should review food vending permits and canteen operations to prioritize and subsidize healthier, low-cost meal options on campus. This addresses the **Community level** by disrupting easy access to obesogenic foods.
2. **Sleep Support Services:** Implement awareness campaigns during orientation and exam periods promoting the **7-8 hour sleep duration** as essential for academic performance and metabolic health. Students tend to deprive themselves from sleep due to poor time management. This addresses the **Interpersonal level** (social norms) and the **Intrapersonal level** (knowledge).

6.2.2 Individual and Future Research Recommendations

1. **Targeted Health Education:** Health services should focus educational materials not only on physical activity (which was non-significant in the adjusted model) but primarily on the dangers of **frequent fast-food consumption** and the protective benefits of optimal sleep.
2. **Longitudinal Study:** Future research should conduct a longitudinal study to establish the causality and temporal sequence between FFC, sleep duration, and BMI change throughout the academic years at UNILUS.
3. **Granular Measurement:** Future studies should use more sophisticated and granular measurement tools, such as continuous data loggers for physical activity and validated food frequency questionnaires (FFQs), to capture more subtle effects of lifestyle factors not detected in this cross-sectional study.

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APPENDIX

Data Collection Tool (Structured Questionnaire)

Study Title: Identifying Demographic and Lifestyle Factors Associated with Obesity Among University of Lusaka Students in Lusaka, Zambia

Researcher: Champo Daniel

Supervisor: Dr Novan Tembo

Introduction:

Hello, my name is Champo Daniel, a BSc Public Health student at the University of Lusaka. I am conducting a research study to investigate the demographic and lifestyle factors associated with obesity among students at UNILUS. This study is being conducted as a partial fulfilment of the requirements for a Bachelor of Science degree in Public Health.

Your participation in this study is entirely voluntary, and you are free to withdraw at any time without any consequences. All information you provide will be treated with the utmost confidentiality and will be anonymized, meaning your name will not be linked to your responses. The data collected will be used exclusively for academic purposes, and findings will be reported honestly and transparently.

Completing this questionnaire should take approximately 3-5 minutes.

By completing this questionnaire, you are providing your informed consent to participate in this study.

Thank you for your time and valuable contribution to this research.

Section 1: Demographic Information

This section asks about your background information.

- These questions aim to collect data on **demographic characteristics** such as age, gender, and socioeconomic status. Location is also included as a demographic factor to be examined.

1. **What is your age in years?**
 - [Open-ended numerical response]
2. **What is your gender?**
 - Male
 - Female
3. **Which UNILUS campus do you attend?**
 - Silverest
 - Mass media/pioneer campus
 - Leopards hill
4. **What academic year are you currently in?**
 - 1st Year
 - 2nd Year
 - 3rd Year
 - 4th Year
 - 5th Year+
5. **Where do you primarily live while attending university?**
 - On campus
 - Off campus (in Lusaka/urban area)
6. **Which of the following best describes your socioeconomic status?**
 - Low income
 - Middle income
 - High income
7. What is your weight(kg)? _____
8. What is your height (cm)? _____

Section 2: Lifestyle Factors

This section asks about your daily habits.

- These questions aim to collect data on **lifestyle factors** including dietary habits, physical activity levels, and sleep patterns.
7. **How many times per week do you typically eat fast food (e.g., shawarma, fried chicken, chips, pizza, burgers)**
 - Less than once a week

- 1-2 times per week
 - 3-4 times per week
 - 5 or more times per week
8. **How often do you consume sugary drinks (e.g., carbonated drinks i.e. sodas, sweetened juices, energy drinks)?**
- Never
 - Rarely (less than once a week)
 - 1-3 times per week
 - Almost daily
 - Multiple times per day
9. **On an average day, how many servings of fruits and vegetables do you eat?**
- 0-1 serving
 - 2-3 servings
 - 4-5 servings
 - 6 or more servings
10. **In a typical week, how many days do you engage in moderate-to-vigorous physical activity (like brisk walking, jogging, sports) for at least 30 minutes?**
- 0 days
 - 1-2 days
 - 3-4 days
 - 5-7 days
11. **How many hours of sleep do you typically get per night on weekdays?**
- Less than 5 hours
 - 5-6 hours
 - 7-8 hours
 - More than 8 hours
12. **How many hours of sleep do you typically get per night on weekends?**
- Less than 5 hours
 - 5-6 hours
 - 7-8 hours
 - More than 8 hours
13. **How often do you consume alcohol?**
- Never
 - Less than once a month

- 1-3 times per month
- Once a week
- Multiple times per week

WORK PLAN

ACTIVITIES	2025 Feb	2025 Mar	2025 Apr	2025 May	2025 Aug	2025 Sept	2025 Oct	2025 Nov
Proposal Writing								
Ethical clearance, Proposal defence and submission								
Data Collection and Analysis								
Dissertation writing								
Final submission								

BUDGET

No	Description	Quantity	Unit price	Total price

1	Transportation	To & From x 5	K80	K400
2	Stationery	-	K200	K200
3	Food	Lunch x 5	K45	K225
4	Data Bundles	5GB x 5	K50	K250
5	Ethical clearance	1	K500	K500
7	Miscellaneous	1	K300	K300
	TOTAL			K1,875



NATIONAL HEALTH RESEARCH AUTHORITY

Lot No. 18961/M, off Kasama Road, Chalala, P.O. Box 30075, LUSAKA
Tell: +260211 250309 | Email: znhrasec@nhra.org.zm | www.nhra.org.zm

NHRA10292/30/09/2025

30th September 2025

The Principal Investigator,
Daniel Champo,
University of Lusaka,

Dear Daniel Champo,

Re: Request for Authority to Conduct Research

Research Titled "Identifying Demographic and Lifestyle Factors Associated with Obesity Among University of Lusaka Students in Lusaka, Zambia"

I wish to inform you that following submission of your request to the Authority, our review of the same and in view of the ethical clearance, this study has been **approved** on condition that:

1. The relevant Provincial and District Medical Officers where the study is being conducted are fully appraised.
2. Progress updates are provided to NHRA bi-annually from the date of commencement of the study.
3. The final study report is cleared by the NHRA before any publication or dissemination within or outside the country.
4. After clearance for publication or dissemination by the NHRA, the final study report is shared with all relevant Provincial and District Directors of Health where the study was being conducted, University leadership, and all key respondents.

All correspondences should be addressed to the Director/CEO National Health Research Authority

Yours sincerely,

National Health Research Authority

A handwritten signature in black ink, appearing to read 'VC', with a long horizontal stroke extending to the right.

Prof Victor Chalwe,

Director and Chief Executive Officer



UNIVERSITY *of* LUSAKA

Passion for Quality Education: Our Driving Force

**UNIVERSITY OF LUSAKA RESEARCH ETHICS COMMITTEE
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UNILUS-RESEARCH ETHICS COMMITTEE

Ref no: FWA00033228-1021(08)/(08)/{2024}

Date: 16 September 2025

STUDENT NAME: **Mr. Daniel Champo**

**Identifying Demographic and Lifestyle Factors Associated with Obesity Among
UNILUS Students in Lusaka, Zambia**

The above research was submitted to the research ethics committee for review. The study has no major ethical problems and is approved subject to the following: