AFRICA UNIVERSITY

(A United Methodist Related Institution)

NUTRITIONAL AND LIFESTYLE HABITS AMONGST ADULTS IN URBAN HARARE, ZIMBABWE DURING THE COVID-19 LOCKDOWN

BY

FAITH MUGUGU

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH IN THE COLLEGE OF HEALTH SCIENCES OF AFRICA UNIVERSITY
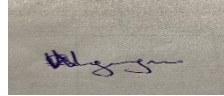
2022

Abstract

The rapid spread of the disease led to Covid-19 being declared a pandemic by the World Health Organisation, WHO. This resulted in nations effecting containment measures that included lockdowns to contain the spread. COVID-19 pandemic represents a massive impact on human health causing sudden lifestyle changes, through social distancing and isolation at home. The aim of the study was to assess the impact of COVID-19 confinement measures on health behaviors such as eating habits, physical activity, sedentarism, alcohol consumption and tobacco use, and the change in body weight among adults in Harare. Further, the association of these behaviors with the risk and development of non-communicable diseases. An analytical cross-sectional study, looking at 144 participants aged at least 40 years resident in three residential areas in Harare since the first lockdown of 30 March 2020 was performed. An interview-based questionnaire collected data on demographic, lifestyle factors and nutritional habits as well as reported non-communicable diseases. We reported prevalence of different demographic and lifestyle factors, change in nutritional habits and reported incidence of NCDs making comparisons by sex using the Chi-square for categorical variables and Student t-test/Mann Whitney U test for normal and skewed data respectively. All comparisons reported a p-value<0.05 if there were significant differences. Logistic regression was performed to determine the magnitude of the measure of association between study factors and NCDs. The majority of the enrolled participants were females (71.5%) and most had attained ordinary level education. Almost half (45.7%) of the participants perceived that the gained weight with an overall reported increase in junk food items (sugary drinks and snacks/sweets). Participants reported an increase in the amount of alcohol consumed, whilst 56.3% indicated having more than three meals per day. Eighty percent of the participants reported working from home during the pandemic and less than a quarter (22.2%) performed any moderate physical activity. Hypertension was the most reported NCD (38.2%), whilst 67/144 had at least one NCD with more females reporting them. Access to healthcare was minimal, while the highest reported incidence was for hypertension. Alcohol use [OR=1.65, 95% CI: 0.92-2.17], perceived weight gain [OR=2.12, 95% CI: 1.72-3.12] and lack of access to drugs and medication [OR=2.22, 95% CI: [1.43, 3.11]. In summary, we have identified that covid-19 lockdowns resulted in change in lifestyle factors and nutritional habits that could have led to the occurrence of new NCDs due to the lockdown travel restrictions. We have also shown that lack of easily accessible health services, drugs and medications had a negative impact in both old and new NCD cases. The researcher recommends awareness on healthy eating and physical activity and introduction of e-health and telemedicine.

Keywords: COVID-19; lockdown; lifestyle; NCDs; nutrition, physical activity

Declaration

I declare that the dissertation is my original work save for where sources have been cited and acknowledged. The work has never been submitted, nor will it be submitted to another university for award of a degree.

Faith Mugugu   10-05-22

Student's Full Name   **Student's Signature (Date)**

Mr. Elliot Chikaka   101121

Main Supervisor's Full Name   **Main Supervisors' Signature (Date)**

Copyright

Acknowledgements

Dedication

This research is dedicated to my loving husband Artwell who has been my pillar of strength throughout the research, my parents, Mr and Mrs T.J Mugugu throughout their encouragement I have managed to come this far in my academic endeavour.

List of Acronyms and Abbreviations

WHO World Health Organisation

NCD Non-communicable diseases

BMI Body Mass Index

CVD Cardio Vascular Disease

LMIC Low Middle Income Countries

CDC Center for Disease Control and Prevention

Table of Contents

List of Tables

List of Figures

List of Appendices

CHAPTER 1 INTRODUCTION

1.1 Introduction

COVID-19 is a new infection caused by coronavirus 2 (acute severe sickness of the respiratory system) (SARS-CoV-2). The disease's rapid spread across the globe prompted the World Health Organization to designate it a pandemic on March 11th, 2020. (World Health Organization, 2020). Governments had to implement containment measures, including a countrywide lockdown, to combat to prevent the disease's spread. The COVID-19 pandemic has had an immediate impact on human health, resulting in social isolation and lifestyle modifications. A radical and sudden change has been caused by the lockdown with regards to the eating lifestyles and habits of the population, with a drastic reduction of any form of socialisation, (Di Renzo et al., 2020). The changes in lifestyles have a considerable risk of behaviours of the sedentary nature, modification in smoking, alcohol consumption and sleeping habits.

A balanced nutritional diet includes eating at least 400g or five portions of vegetables and fruits as well as other dietary fibre such as whole grain. However, evidence from previous studies has shown that populations substituted all these with processed foods, foods high in energy, fats, free sugars and sodium, and majority of the populations reduced in physical activity, (Sánchez-Sánchez et al., 2020). These are the possible risk factors of the development of Non-communicable diseases during the pandemic lockdowns. The consumption of a healthy diet through-out the course of an individual's life helps in the prevention of malnutrition within all its constituent forms as and a range of non-communicable diseases and conditions.

Non-communicable diseases, (NCDs), are the foremost cause of death and disability globally affecting a large portion of people each year than all other cases combined.

NCDs are to blame for over 70% of deaths, with almost 80% of said deaths occurring in Low-to-middle-income countries (LMIC), (WHO, 2020). Due to the chronic and sometimes lifelong nature, NCDs often require repeated interaction with health systems over long periods of time. Hence, this study therefore aimed to detect any change in nutrition and lifestyle modification in adult's urban Harare during the course of the COVID-19 pandemic lockdown.

1.2 Background

COVID-19 is a currently occurring global pandemic with a reach on all nations as well as the proper functioning of all levels of health systems. The unique infection is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and has spread over the world in a couple of months, prompting the World Health Organization to designate it a pandemic (Ogunleye et al., 2020). The COVID-19 pandemic has made cities like Harare its epicentre. In Zimbabwe like all the other countries that have been affected by COVID-19 globally, on Friday the 27th of March, the president of Zimbabwe, Emmerson Mnangagwa announced that from the 30th of March a national lockdown that effected for 21 days to prevent further spread of the ongoing outbreak of COVID-19. During the lockdown, all informal markets were to be closed and the formal markets were to open for only 4 hours during the day, exemption was only pharmaceutical industry, food markets and other essential services.

All public transport except ZUPCO were suspended, and mass transport operations were also suspended. Physical separation as well as quarantine can result in inadequate prevention and control of NCD risk factors such as physical inactivity, bad diets, cigarette use, and harmful alcohol use (Kluge et al., 2020). Due to labor force readjustment regulations, people' disposable income was drastically reduced

during the national lockdown, and many were forced to move to teleworking. This led to adjustments in lifestyle habits especially those concerning physical activity and food consumption. It is known that physical activity and healthy eating are key for health and wellbeing, especially when challenges come up for the immune system. Sedentary lifestyles, anxiety, and boredom brought on by social isolation may contribute to changes in lifestyle behaviors, as well as binge eating (Sánchez-Sánchez et al., 2020). Because people are bored at home, social alienation at home may encourage or diminish alcohol consumption and cigarettes smoked per day.

Sustained confinement for a lengthy period of time can lead to undesirable behaviour changes, which can affect community health. Specific health behaviours such as overeating, unhealthy diet, reduced physical activity, increased smoking and addictive use of alcohol, (Drieskens et al., 2021). There is also evidence that alcohol consumption is associated with an increased Body Mass Index which may eventually lead to overweight and obesity, which may enhance the risk of chronic diseases, (Ismail et al., 2020). Being more at home during the confinement periods may be an easier way to access snacks. Epidemiological studies have found a positive association between smoking and gaining of weight among adults, (Drieskens et al., 2021). The lifestyle habits and nutritional uptake during the lockdown may therefore pose a risk on the development of chronic diseases. Prevention, control and management of NCDs is pivotal in the response to COVID-19 and an extensive reaction is need to cater for the needs of individuals with NCDs.

NCD prevention is critical since the true size of the risk population is likely underestimated due to the fact that many chronic diseases go undetected (Kluge et al., 2020). Zimbabwe has seen an increase in communicable disease morbidity and mortality, as well as an increase in the prevalence of NCDs. NCDs accounted for an

estimated 21% of overall deaths in Zimbabwe in 2008, with hypertension topping the list of NCD outpatient visits documented in Zimbabwe public hospitals in 2006, (Mutowo, 2015). In regions of Zimbabwe, urbanization has resulted in the westernization of lives. Diets heavy in refined, starchy carbohydrates are linked to rising obesity rates and the incidence of hypertension, diabetes, and CVD in metropolitan areas, (Matenga et al., 1997).

1.3 Statement of the Problem

The COVID-19 induced lockdowns are normally characterized with restricted movements and disrupted food supply and accessibility in most settings. Specifically, the COVID-19 control measures and travel restrictions may compromise the ability to maintain physical activity and healthy lifestyles including reduced consumption of diverse and nutritious diets. Lockdowns support more sedentary lifestyle which has been associated with increased risk of non-communicable diseases, NCDs and poor nutritional habits. A study in Middle East and North Africa on eating habits and lifestyle changes during the pandemic lockdown revealed that the lockdowns caused a variety of lifestyle changes, an increase in physical inactivity and psychological problems among adults in the region, (Cheikh Ismail et al., 2021). Nutritional habits and lifestyle effects on individual health and also on the development of NCDs need to be addressed especially in confinements where populations adjust their way of life and increase the risk factors. It is against this background the researcher proposed to conduct a study assessing the changes in nutritional and lifestyle habits during COVID-19 lockdowns in urban Harare adult residents. The researcher further intends to estimates on any new NCD cases and whether they are attributable to nutritional and lifestyle changes.

1.4 Purpose of the study / Broad Objective

The broad objective of the study is the assessment of the nutritional, health and lifestyle patterns among urban Zimbabweans during the COVID-19 lockdowns for the period March 2020 to August 2021.

1.4.1 Specific Objectives
The study will specifically seek to:

➢ Assess the current and change in nutritional habits of urban Zimbabweans during the COVID-19 induced lockdowns

➢ Assess the current and change in lifestyle among urban Zimbabweans during the COVID-19 induced lockdowns

➢ Estimate the incidence of NCDs during the lockdowns and the possible effect of lifestyle and nutritional factors on NCDs during this period.

1.5 Research Questions

➢ What is the current and pattern in change of nutritional habits among urban Harare during COVID-19 lockdowns?

➢ What is the current and change in lifestyle among urban Harare during the COVID-19 lockdowns?

➢ What is the incidence of NCDs during the lockdowns among urban Harare?

➢ What is the possible effect of the lifestyle and nutritional patterns on the incidence of NCDs during lockdown?

1.5 Significance of the study

It is pivotal to research on the lifestyle and eating habit adjustments during the pandemic lockdown in light of the self-isolation and physical distancing that played an extensive part in citizens' lives, with effects in everyday behaviours and eating

habits, (Chang et al., 2021). Lifestyle modification and eating habits may have a negative impact on our health especially with Non-communicable diseases (NCDs), because of its common risk factors that include unhealthy diets, harmful use of alcohol, physical inactivity and tobacco use. According to the WHO NCDs country profile 2018, NCDs were estimated to account for 33% of all deaths in Zimbabwe, (WHO, 2018). Results from the study may be useful in implementing awareness campaigns that will assist communities to watch on what they eat, modify their lifestyle for the better and include physical activity whenever they are in containment, and development of policies that promote healthy eating habits and lifestyle. Further, the study will bring out the association of these behaviors with the risk and development of non-communicable diseases. Findings will help develop evidence-based prevention programs aiming to alleviate the heavy burden of unhealthy lifestyle and its consequences on the health of populations in Harare, Zimbabwe.

1.6 Delimitations

The study will be conducted in Harare and will focus on adults of the age 40 years and above who are either working or not. The study will only focus on individuals that were residing in Harare from the period of the first lockdown of 30 March 2020 to date.

1.7 Limitations

Anticipated limitations of the study include incomplete and inaccurate data from the participants when they fail to recall on some of the sections in the questionnaire that took place at the beginning of the lockdown. The researching is basing on ability of the participants to recall; therefore, the research is subject to recall bias. The ongoing

pandemic restriction measures may also limit movement compromising the sample size.

1.8 Chapter Summary

COVID-19 infection is a severe disease that has rapidly spread across the globe and has since been declared a pandemic by the WHO. Lockdowns were implemented to assist contain the spread of the epidemic, but they have now impacted people's daily lives around the world. The regular functioning of the human body requires a healthy diet and lifestyle. Individuals must consequently maintain a nutritious diet rich in essential nutrients and remain physically fit. Lockdowns hampered healthy diets and lifestyles of individuals as there was a sudden movement restriction with closure of gymnasiums, decongestion of workplaces, hence most persons were compelled to work from home. NCDs are caused by unhealthy diets, lack of physical activity, harmful alcohol consumption, and smoking. Lockdowns encourage a more sedentary lifestyle, which has been linked to an increased risk of NCDs. The purpose of the study was therefore to assess the nutritional, health and lifestyle patterns among urban Zimbabweans during the COVID-19 lockdown from March 2020 to August 2021. The study will bring out the association of these behaviors with the risk and development of non-communicable diseases. The results from the study will help develop policies on healthy eating and lifestyle especially in confinements.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.0 Introduction

This section is an overview of the previously published works on the lifestyle and nutritional habits in the midst of the COVID-19 lockdowns. The section will also aim to summarizes and provide a critical analysis of the research arguments found from different sources without making new contributions.

2.1 Conceptual framework
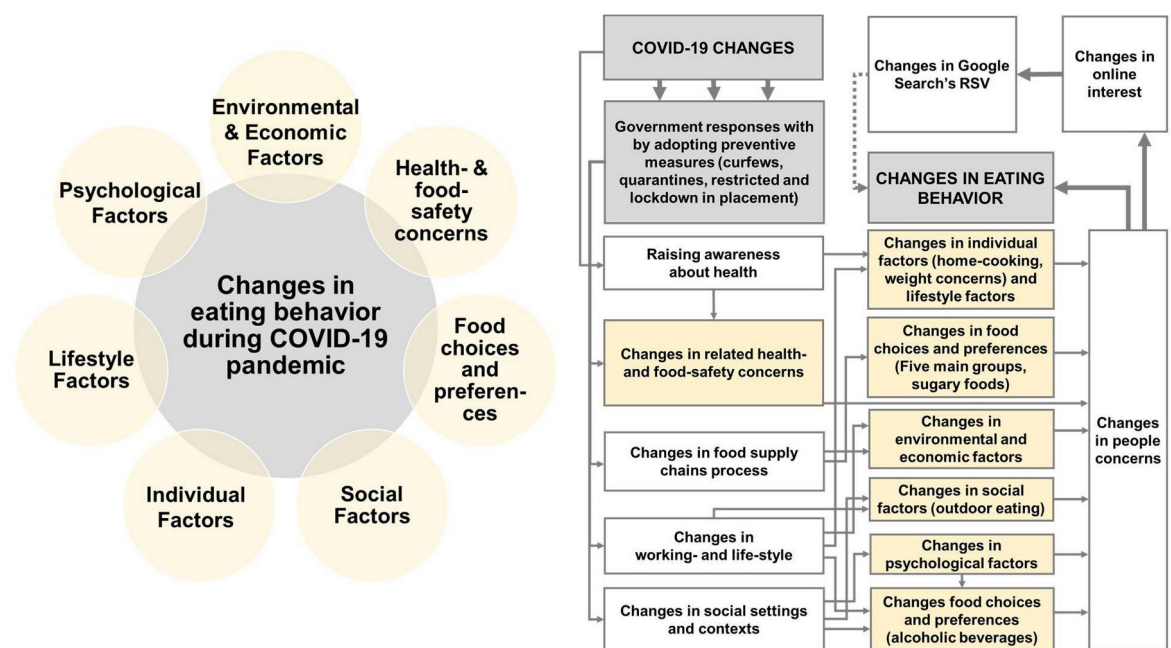
Figure 2 1. Conceptual Framework

Adopted from, "Impacts of COVID-19 Pandemic and Its Lockdown on Global Eating Behavior" (Ngoc & Kriengsinyos, 2020).

2.2 Relevance of Conceptual framework

A conceptual framework for the changes in nutritional and lifestyle behaviour during the COVID-19 pandemic lockdowns was analysed in the present study. Seven factors contributed to the changes in eating behaviour are mentioned as following: (1) environmental and economic factors, (2) health- and food-safety concerns, (3) food choices and preferences, (4) social factors, (5) individual factors, (6) lifestyle factors, and (7) psychological factors. Under the food

choices and concerns, individuals had a wide variety of food choices that would affect them during the confinement. Amongst these, there is alcohol, snacking and sugary consumption. Social factors were also considered from the framework that would include eating outdoors, and meeting loved ones, (Hawkes et al., 2013). The relevance of this factor is that whether or not the individuals would have take-aways during the pandemic and considering the times of trading, what frequency would individuals have on fast foods and the overall impact of the frequency on their nutritional habits and lifestyle.

Individual factors were also considered in the framework, these included home-cooking, weight concerns and food choices. Whether or not individuals increased on home-cooked food was of crucial importance. If they reduced, would they possibly have increased on snacking frequency or any other food choices, this would on overall impact on the nutritional habits during the confinement, (Laar et al., 2020). The other factor considered from the framework in the study was lifestyle. This would look at where the populations employed or not, were they working from home during the confinement, was there an increase in sedentary lifestyle, alcohol consumption, smoking, physical activity and the type of work they usually, is it moderate to vigorous activity work or not, (Villena-esponera et al., 2021). The confinement might have had a significant change in individual's lifestyles as the restrictions brought about closure of gymnasiums, decongestion of offices and limited movements of individuals.

Lastly the other factor that was considered from the framework is psychological such as anxiety, loneliness, boredom that affected eating habits during the confinement. Pandemics, wars and natural disasters are extensively stressful

occurrences, that can easily result in adverse mental health states and negative emotions, for example, perceived lack of control and instability, these are the core aspects of emergency situations, contribute directly to stress, (Di et al., 2021).

2.3 Literature review

2.3.1 NCDs distribution and risk factors

In Sub-Saharan Africa, communicable diseases such as malaria, tuberculosis and HIV have long been among the most prominent contributors to disease burden, (Gouda et al., 2019). However, in recent years Sub-Saharan Africa countries are experiencing a massive epidemiological change that is characterised through a transition from disease burden profiles featured by diseases that are communicable and child illnesses to paradigms featuring the increasing prevalence of chronic NCDs. Understanding NCDs by examining their epidemiology is limited by lack of pre-existing vital statistics, reliable population-level data as well as systems for most countries in the region. Most adults are exposed to at least one risk factor for NCDs, including tobacco use, hazardous alcohol use, bad food, and physical inactivity, according to NCDs risk factor surveillance in Sub-Saharan Africa over the last ten years (Dowling & Yap, 2014).

The shifting epidemiology of chronic diseases is linked to global economic development, which has resulted in an aging population in some cultures and a shift in lifestyle, which has resulted in greater obesity, alcohol and tobacco usage, and physical inactivity (Mufunda et al., 2006). Furthermore, rapid changes in lifestyles and eating habits that have taken place due to urbanization, industrialization, market globalization and economic development have gained momentum over the past decade. The rapid change has a significant impact on the health and nutritional status

of populations, particularly in developing countries and in countries in transition, (Abraham et al., 2012). There has been an improvement in standards of living have however improved, access to basic essential services has increased, the availability of food has become more diversified and expanded, but there have also been surmountable negative impacts in terms of undesirable dietary patterns, decreased physical activities as well as increased tobacco use which has led to a growth in diet-related chronic diseases, especially among poor people.

A number of factors contribute to the shift from infectious diseases to NCDs in LMICs, including a decrease in physical activity due to sedentary lifestyles, a shift from traditional foods to processed foods high in fat, salt, and sugar, and changed cultural norms such as an increase in the number of women who use tobacco, all of which are associated with economic development (Gouda et al., 2019). Globalisation and urbanisation have hastened the spread of NCDs in low- and middle-income countries. Governments in LMICs, on the other hand, are not keeping up with the growing need for policies, legislation, services, and infrastructure to prevent NCDs, which disproportionately impacts the poor. The lockdown has resulted in a dramatic shift in population habits and lifestyles, with a significant decline in any type of socialization. Physical separation and isolation have a significant impact on residents' lives, particularly on eating habits and everyday behaviors (Di Renzo et al., 2020).

Staying at home, which includes digital-education, smart working, limiting outdoor and in-gym physical activity, and accumulating food owing to supermarket shopping restrictions, are the two key factors. In addition, the interruption of the work routine caused by the quarantine could result in boredom which in turn is associated with greater energy intake, (Ogunleye et al., 2020). Stress leads subjects towards overeating, especially comfort foods rich in sugar, defined as food cravings. These

foods are rich in simple carbohydrates and can reduce stress as they encourage serotonin production with a positive effect on mood, (Di Renzo et al., 2020).

2.3.2 Nutritional habits

Diet and nutrition are critical components in the promotion and maintenance of good health throughout one's lifetime. Because of their well-established function as predictors of chronic NCDs, they play a key role in preventative efforts (Willett & Stampfer, 2013). Diet has long been recognized as a risk factor for chronic diseases. Great changes appear to have swept the globe since the second part of the twentieth century, causing huge dietary changes, first in industrialized regions and then in emerging countries. To realize a balanced nutritional diet, populations have to eat at least 400g or five portions of fruit and vegetable per day to reduce the risk of NCDs. Improvements can be done by always including vegetables in meals and eating fresh fruits as snacks. In a study by Di Renzo *et al*, 2020, their recommendations to populations was to at least have a vegetables garden in the backyard to reduce expenses of always purchasing perishable foods on a daily basis. This was also important as it assisted populations especially in confinements like the COVID-19 lockdowns where movement was restricted. Individuals' diets were easily harmed by confinement because fresh fruits and vegetables were difficult to access.

In adult populations, limiting total fat consumption to less than 30% of total calories helps to prevent unhealthy weight gain. As a result, people should consume less than 10% of their total energy from saturated fats (Bruins et al., 2019). This can be accomplished by avoiding frying their meals and instead steaming or boiling them. Consume low-fat dairy products and lean meats, or trim visible fat from meat.

Limiting the consumption of baked and fried meals, as well as pre-packaged snacks and foods such as cakes, cookies, donuts, and biscuits, can help people lose weight.

The majority of people eat meals that are rich in sodium and low in potassium, which leads to high blood pressure and an increased risk of heart disease and stroke. Individuals may consume less sodium if they eat fewer meals each week. People are typically unaware of how much salt they consume at any given moment, with the majority of it coming from meals consumed in big quantities frequently, such as bread. Free sugar consumption should be kept to less than 10% of total energy consumption, (Penagini et al., 2013). Free sugars raise calorie intake, which leads to an undesirable weight gain that leads to overweight and obesity. Reducing free sugars lowers the risk of diabetes. Individuals can reduce their intake of free sugars by decreasing their intake of high-sugar meals and beverages, such as carbonated beverages, sugary snacks, and coffee. Free sugars in the body are reduced by eating fresh fruits and vegetables.

Plant-based diets have been rapidly supplanted by high-fat, energy-dense diets that include a significant amount of animal-based foods. Obesity and hypertension are linked to consuming too much nutritional calories, salt, and animal fat. Increased consumption of vegetables, fruits, and high-fibre foods, on the other hand, lowers the risk of chronic disease. However, but diet, while critical to prevention, is just one risk factor, (Willett & Stampfer, 2013). Each individual's dietary propensity is probably going to be impacted by different issues, including accessibility and reasonableness of food, for example, meat, fish, vegetables and natural products, way of life and work conditions, family propensity, prevailing burden from companions and partners, social convictions and conventional traditions, individual inclination, and absence of healthful information, (Gebremariam et al., 2018). Subsequently, it is

expected to research individuals' dietary propensity and their experience factors to lessen dangers of NCDs.

Limited access to daily grocery shopping may lead to reduction of the consumption of fresh foods like vegetables and fruits in favour of highly processed foods that are not good for patients with hypertension as they require healthy diets. Lifestyles may be substantially changed due to containment measures, with the consequent risk of sedentary behaviours, modification in smoking, alcohol intake and sleeping habits, (Pati et al., 2021). Eating habits and lifestyle modification may threaten our health especially with NCDs because of its common risk factors that include unhealthy diets, physical inactivity, tobacco use and harmful use of alcohol. Previous studies on eating habits during COVID-19 lockdown indicated that majority of participants had a significant change in their eating habits during the lockdown, (Di Renzo et al., 2020).

Available literature, has shown trends towards unhealthy dietary behaviours during the lockdown such as increased snacking, increased calorie intake, reduced consumption of fresh fruits and vegetables and weight gain. Results from a study by Cheikh et al 2020, indicated that COVID-19 pandemic lockdown resulted in weight gain and lifestyle modification that included reduced physical activity. Participants also reported an increase in the number of meals consumed per day as they spent the whole day at home and a reduction in the percentage of skipping meals during the pandemic, (Ismail et al., 2020).

Another study by Drieskens *et al* 2021 which was conducted among adults in Belgium, indicated that the most important correlate of weight gain during the confinement were because of an increased consumption of sweet and salty snacks and being less physically active. These findings have therefore become evident

among populations that the COVID-19 lockdowns have impacted on the nutritional and lifestyle habits. However, some individuals maintained their physical activity through the use of online applications for exercises.

2.3.3 Healthcare services during the lockdowns

Another study on the effects of the COVID-19 restrictions on NCDs showed that, pre-COVID-19 era, stakeholders described various preventive, diagnostic and treatment services that included well-used antenatal and immunisation programmes, and some screening for hypertension, tuberculosis, HIV and vector-borne diseases. They further showed that in all sites, pharmacists and patent medicine vendors were key providers of treatment and advise for minor illnesses. During COVID-19, outcomes indicated that there was a significant reduction in access to healthcare services including preventive services, (Ahmed et al., 2020). Residents had difficulty reaching healthcare facilities and had fear of being diagnosed with COVID-19 when they visit the healthcare facilities.

COVID-19 confinement has affected accessing healthcare and medication amongst populations worldwide especially in developing countries like Zimbabwe. This has affected especially people living with chronic conditions that require continuous use of medication and healthcare services for checkups. It became very difficult for individuals to go to healthcare facilities for check-ups if there are any issues affecting them health wise. It became very difficult for patients to access medicines as most of the healthcare facilities were closing very early because of the curfews that governments came up with to curb infection rise. A study in India revealed that COVID-19 pandemic and the lockdowns brought to reduce spread of the infection, significantly reduced access to healthcare, adversely impacted self-care behaviours

and increased mental health problems, (Singh et al., 2020). However, for developed countries, there were already online platforms for purchasing of drugs and had already adopted e-health where medical practitioners can have consultations with their patients online. The pandemic therefore to some extent did not directly affect them in accessing healthcare and accessing medicines.

In Nigeria, like any other country the lockdown was accompanied with the closure of borders and travel ban across states. This led to a significant drop in the quantity of essential medicines in the health facilities, which therefore made it difficult for consumers to get the medicines they need and particularly affecting those on chronic medicines. The COVID-19 pandemic also caused an increase in the prices of medicines, hand sanitizers, face masks, personal protective equipment, and other medical equipment used for providing health care, (Awucha et al., 2020). This greatly affected supply chain of essential medicines worldwide and therefore individual had challenges in accessing medicines.

2.3.4 Physical activity and sedentary behaviors

Achieving recommended levels of physical activity is crucial to individuals so as to achieve the physiologic and psychosocial benefits associated with physical activity, and reduce the risk of several chronic diseases. Physical inactivity is a challenge that has become a pandemic that needs urgent action. It is basically the inability to achieve the recommended levels of physical activity for health, (Abraham et al., 2012). Current guidelines by World Health Organization recommend performing at least 150 min of moderate-intensity or 75 min of vigorous-intensity aerobic physical activity per week, together with muscle-strengthening activities two or more days per week, (Luciano et al., 2021). Aerobic physical activity improves sleep time since it has effects on endocrine, metabolic, vascular and immune systems, on mood and

circadian rhythm. Both chronic and acute sleep loss can reduce physical performance, alertness and rates of perceived exertion during physical activity. With the confinement it is evident that physical activity was reduced by majority of populations. The study on this assessment showed that there are a significant difference in the physical activity before and during the lockdown, (Luciano et al., 2021).

Majority of populations globally failed to have the recommended at least thirty minutes of regular, moderate -intensity physical activity on most days throughout a lifetime. The easy access to modern technology and manufacturing in houses and workplaces, including machines, vehicles and labour-saving technology has made life a whole lot easier but unhealthier from the perspective of reducing the risk of NCDs, (Abraham et al., 2012). Understanding the changes in physical activity and sedentary behaviors during lockdown is important not only for health outcomes associated with these behaviors, but also for recommendations to governments on development of public health interventions in specific populations such as physical activity promotion and interventions to decrease sedentary behavior in case we have another lockdown enforced, a similar pandemic scenario and during the return to normal life, (Stockwell et al., 2021).

2.4 Chapter Summary

In summary different authors have addressed that people from all over the globe had different lifestyle and nutritional changes during the lockdown. Majority of them have had negative changes in eating habits where they had more meals per day that they usually had before the confinement. Some of the authors indicated that individuals were sticking to the Mediterranean diets during the confinement.

However, it is of great concern that some authors results indicated weight gains and increase in free sugars in their diets which has an association with the development of NCDs. Also noted is the increase in alcohol consumption which was related to the stress levels of individuals due to the morbidity and mortality rates of the infection. The confinement was associated with boredom and anxiety that eventually led to depression in most of the populations. The lockdowns also had a negative impact on healthcare services, that included doctors' appointments and access to essential medicines. However, for individuals in developed countries, it was somehow easier as they would do all the appointments and purchasing of drugs online. This was because of their developed and functioning e-health and telemedicine that has not been fully adopted in most developing countries.

CHAPTER 3 METHODOLOGY

3.0 Introduction

Research methodology outlines the rationale for application of specific procedures used to identify, select and analyze data to understand the research problem. It provides an explanation of the choices made for testing the relationships in the conceptual model, including the sampling, procedure, measures, and the analytical approach.

3.1 Research design and setting

An analytical household-based cross-sectional study design was used for this study. The study design will enable to describe current COVID-19 situation in relation to lifestyle and eating habits.

3.2 Study setting

The household-based study was conducted in three randomly selected Harare suburbs, Glen view, Waterfalls and Mt Pleasant, households were systematically selected from a sampling frame of households obtained from the city council offices. The setting was selected because of the strictness of the COVID-19 restrictions in the city and immobility of people.
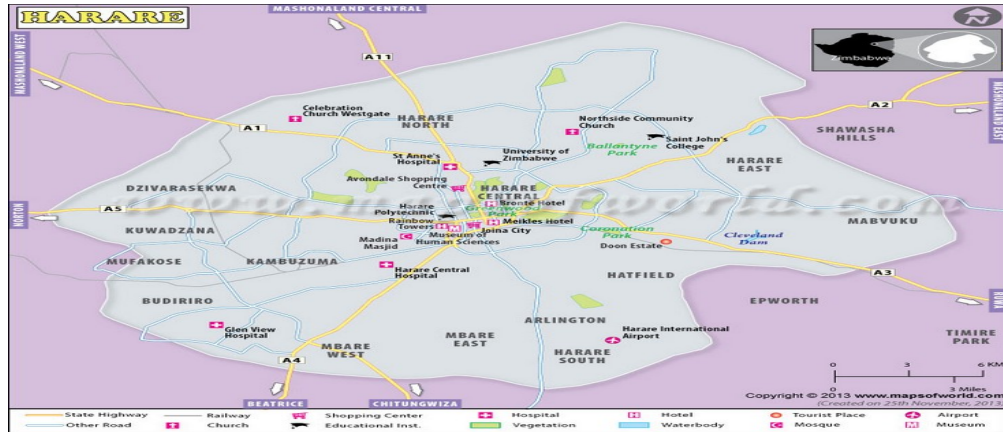
Figure 3 1 Harare Suburbs

3.3 Study population

The study will target older participants resident in Harare.

3.3.1 Inclusion Criteria

- A participant aged between 40 and 65 years

- Resident in Harare since the first covid-19 lockdown and currently employed

3.3.2 Exclusion Criteria

- Not able to provide informed consent

- Health conditions not allowing the participant to answer the questionnaire

3.4 Sample size

A minimum sample size (n) of participants aged at between 40- and 65-years resident in Harare was calculated using the formula below:

$$n=(Z^2 * p(1-p))/\Delta^2 , \qquad \text{where}$$

z= is the statistic corresponding to 95% level of confidence, i.e 1.96

p= is the expected prevalence of alcohol consumption in adult employed Zimbabweans (0.08, WHO (2016)

Δ= precision/effect size (0.05)

Therefore, a minimum sample size n = (1.96^2*0.08*0.92)/0.05^2

$$= 115$$

Therefore, a minimum of 115 participants will be recruited into the study.

The study anticipates a 20% non-response rate due to potential snub and resistance. This is because of the COVID-19 pandemic. Thus, we aim to target an adjusted maximum sample size (n)

$$n = 115/0.8$$

$$= 144$$

Therefore, we recruited 144 participants into the study.

3.5 Sampling procedure

A multi-stage sampling criterion was performed with two main stages (i) selection of households and (ii) selection of participants.

3.5.1 Selection of households

1. Stratification of residential areas in Harare into low, medium and high-density suburbs

   - All the residential areas in Harare listed by the Harare city council was stratified into three strata namely, low, medium and high density depending on size of residential stands and population density.

2. Random selection of one residential area from the three residential strata

- Stratified/proportional random sampling was used to select three residential areas, each from the three residential strata (low, medium and high). This was performed by (i) placing in three categories a list of residential areas respective to the three residential strata (low, medium and high), (ii) random selection of three residential areas each from the three residential strata (low, medium and high) by a blind-folded person.

3. The sample size was weighted upon the population of the selected residential area.

- The total sample size of 144 was weighted upon the population size of the three selected residential areas representing the three strata (low, medium and high). Due to differences in population sizes between the three strata, weighting was compensated for possible sampling bias introduced by the size of the stratum population size.

4. Systematic sampling of households from the three selected residential areas after getting a list of households from the Harare city council (sampling frame)

- The researcher used a list of all households from the three selected residential areas to systematically select a weighted sample size based on the population size of the selected residential area. This started by (i) numbering the list of households (ii) dividing the total households by the number of households to be sampled in that residential area to get the value k (iii) select every k^{th} household until we reach the weighted sample size in each of the three selected residential areas.

5. From the selected households, one potential participant was selected

- One adult aged between 40 and 65 years was selected from the systematically selected household purposively the head of the household. If the head of the household is not present at the time of the study, any other adult (household member between 40 and 65 years of age) household member present will be recruited. If no member of the household is old enough to participate in the study, the next household will be enrolled into the study.

3.6 Data collection tools

Data was collected by means of interviewer-administered questionnaires with different sections and variables as described in the table below

Table 3 1: Sections and variables in the data collection tool

Measurement	Measurement method	Outcome
Socio-demographic characteristics	Questionnaire	Age, sex, school attendance, employment status, average monthly income
Lifestyle factors	Questionnaire (WHO Healthy Lifestyle Questionnaire)	Diet, Perception of weight, perception of fitness, alcohol consumption, smoking status
Physical performance	Questionnaire (Global Physical Activity Questionnaire)	Moderate physical activity (PA), Vigorous PA, Total vigorous to moderate PA
Clinical history	Questionnaire (WHO Healthy Lifestyle Questionnaire)	Taking medication for diabetes, high blood pressure, heart problems, high cholesterol
Depression	Shona symptom questionnaire for the detection of depression and anxiety	Total score of at least ten as an indication of depression
Recent diagnosis	Questionnaire	Newly diagnosis of diabetes, high blood pressure, heart problems, heart problems and high cholesterol

The reason why each of the data collection tool was selected specifically is as follows:

- Socio-demographic characteristic questionnaire- this specific questionnaire illustrates the age-group that an individual is in and further groups the individual by education attained, employment status and income. This clearly shows each individual's capacity in either lifestyle habits or eating habits as required by this particular study.

- WHO health and lifestyle questionnaire- this specific questionnaire was considered as it is a universal questionnaire that was developed by consolidating different socio-economic factors that affect individuals. The questionnaire therefore applies to any age group and class across the globe.

- WHO physical activity questionnaire- this was selected also as it has physical activity that apply for all age groups, it also incorporates moderate-intensity or vigorous-intensity physical activity, anything that is achievable as long it is physical activity for all age groups.

- Shona symptom questionnaire- for this particular research, the questionnaire was selected as it is easy to understand and comprehend to the participants and to the researcher, it easily detects depression and anxiety with the score attained.

- Recent diagnosis- this specific questionnaire was relevant for the study to see if the changes in nutritional habits and lifestyle was attributable to the development of NCDs.

3.7 Data Collection Procedure

A household-based study was conducted with visits by the study team focusing on:

Step 1: Informed consent process.

The process involved the interviewer educating the participant about the risks, benefits, and alternatives of the study. The participant had to be competent to make a voluntary decision about whether to respond to all the answers in the questionnaire. Participants with writing difficulties made use of a witness to give informed consent on their behalf.

Step 2: Interviewer-administered questionnaire

A paper-based interviewer administered questionnaire was used to record data on socio-demographic characteristics, lifestyle factors, physical performance, clinical history and recent clinical diagnosis using closed ended questions. The questionnaire had sections covering the topics identified above and WHO lifestyle factors and physical performance questionnaires will be adopted for use.

The responses to the questionnaire were entered into a Microsoft excel workbook developed to capture the questions as variables.

3.8 Data Analysis

- Anonymized questionnaire data from hard copies were transferred and stored on Microsoft excel

- Data management including checking on missingness of variables and consistencies of responses were performed using STATA 16 for Windows

- All continuous data were assessed for normality and described as mean (standard deviation), else if skewed as median (interquartile range)

- All categorical variables were presented as frequencies and percentages

- Comparisons of continuous variables were performed using a student t-test (for example age across the three residential areas).

- Chi-square test was used to assess for association between categorical variables (for example, lifestyle exposures by sex)

- All comparisons reported a p-value<0.05 if there were significant differences.

- Logistic regression was performed to determine the significant factors' magnitude of the measure of association (prevalent odds ratios) between lifestyle exposures and NCDs.

3.9 Ethical considerations

For study ethical approval, the fully developed proposal (including study tools) was submitted to Africa University Research Ethics Committee (AUREC) for clearance. Further approvals were sought from the Harare city council as gateway to the study setting. Informed consent was sought from the participants before the interview, thereby educating the participants about the risks, benefits and alternatives of being in the study as highlighted below:

- **Confidentiality-** The information collected for the purposes of the study was described in this consent form. The study did not record names of the participants. Data collected remained de-individualized and was analysed as a group. Thus, maintaining anonymity.

- **Risk/ benefits to participants-** There are no foreseeable physical or psychological risks and discomfort in this study. There is no direct medical or other advantage to participants. However, the information learned in this study will be useful for the government in designing communication programmes aimed at promoting healthy eating and lifestyle habits for day to day and future pandemics.

- **Compensation-** There was no compensation for participating in this study.

- **Conflict of interest-** author declares no conflict of interest.

- **Voluntary participation-** participants were recruited on agreeing to participant voluntarily. No one was forced to participate, rather only those willing to participate did. If they felt they wanted to withdraw from the research, they would freely withdraw and the decision would not affect their day to day life.

A witness was also present if the participant was illiterate. COVID-19 protocols were adhered to during the research, these included wearing of facemasks, social distancing, and sanitising of hands for both the researcher and participants.

3.10 Plan for dissemination of data

Dissemination meetings will be arranged with medical personnel and will be conducted at hospitals to educate doctors, nurses, public health officers about the current situation in relation to NCD exposures. We also aim to submit a complete journal article to inform a wider audience of the results and the possible implications. The study results will also be disseminated to the public using public engagement meetings arranged by other groups and/or the city council.

3.11 Chapter Summary

Research design adopted was analytic cross-sectional study which was conducted in three randomly selected Harare suburbs, Glen View, Waterfalls, and Mt Pleasant. Households were systematically selected from a sampling frame. Participants aged between 40 and 65 years and residing in Harare since the first lockdown were recruited for the study. Those that did not provide informed consent were exclude from the study. A sample size of 144 was recruited for the study and a multi-staged criterion was performed to select households and participants. Data collection was done by means of interview- administered questionnaires on demographics, lifestyle factors, physical activity, clinical history, depression and recent diagnosis. Data was

analyzed using STATA 16 for window, t-test, chi-square and logistic regression. COVID-19 protocols were adhered to during the research, these included wearing of facemasks, social distancing, and sanitising of hands for both the researcher and participants. The chapter concluded by describing how ethical considerations were managed during the study.

CHAPTER 4: FINDINGS

4.0 Introduction

The purpose of this study was to investigate the nutritional, health and lifestyle patterns among urban Zimbabweans during the covid-19 lockdowns. This chapter seeks to present study results. The results are presented under the headings: participant recruitment, participant demographics and anthropometry characteristics, nutritional behaviour during lockdowns, lifestyle patterns and physical activity, reported NCDs and access to health services, assessing COVID-19 lockdowns induced depression, and COVID-19 related factors and risk of comorbidities.

4.1 Data presentation and analysis

Table 4. 1 Participant characteristics by sex

	Total (N=144)	Female (N=103)	Male (N=41)	p-value
Demographics				
Age, mean (SD)	48.8(7.7)	48.4(6.4)	49.5(10.4)	0.448
Age categories				
40-49	86(59.7)	65(63.1)	21(51.2)	0.189
50-60	58(40.3)	38(36.9)	20(48.8)	
Education status				
Primary	22(15.1)	15(14.6)	7(17.1)	0.015
Secondary	99(68.3))	77(74.8)	22(53.7)	
Tertiary	23(16.7)	11(10.7)	12(29.3)	
Marital status				
Never married	3(1.6)	1(1.0)	2(4.9)	<0.001
Currently married	69(48.0)	55(53.4)	14(34.1)	
Separated/Divorced	30(21.5)	19(18.4)	11(26.8)	
Widowed	42(28.9)	28(27.2)	14(34.1)	
Ever been pregnant	96(66.7)	96(93.2)	-	-
Employment status	67 (46.5)	50(48.5)	17(41.5)	0.442
Number of people staying at home	4 (3-6)	5(3-7)	4(2-5)	0.078
Any lockdown support	(8) (5.7)	5(4.9)	3(7.3)	0.172
Type of lockdown support				
Financial support	5(62.5)	3(60)	2(66.7)	0.688
Food handouts	1(12.5)	1(20)	0	
Grocery voucher	2(25)	1(20)	1(33.3)	
Anthropometry				
Perception of weight change, n (%)				
Lost weight	36(25.3)	24(23.3)	12(29.2)	0.090
Gained weight	66(45.7)	53(51.5)	13(31.7)	

	Total (N=144)	Female (N=103)	Male (N=41)	p-value
Did not change weight	42(29.0)	26(25.2)	16(39.0)	

All variables are presented as frequencies and percentages as stated
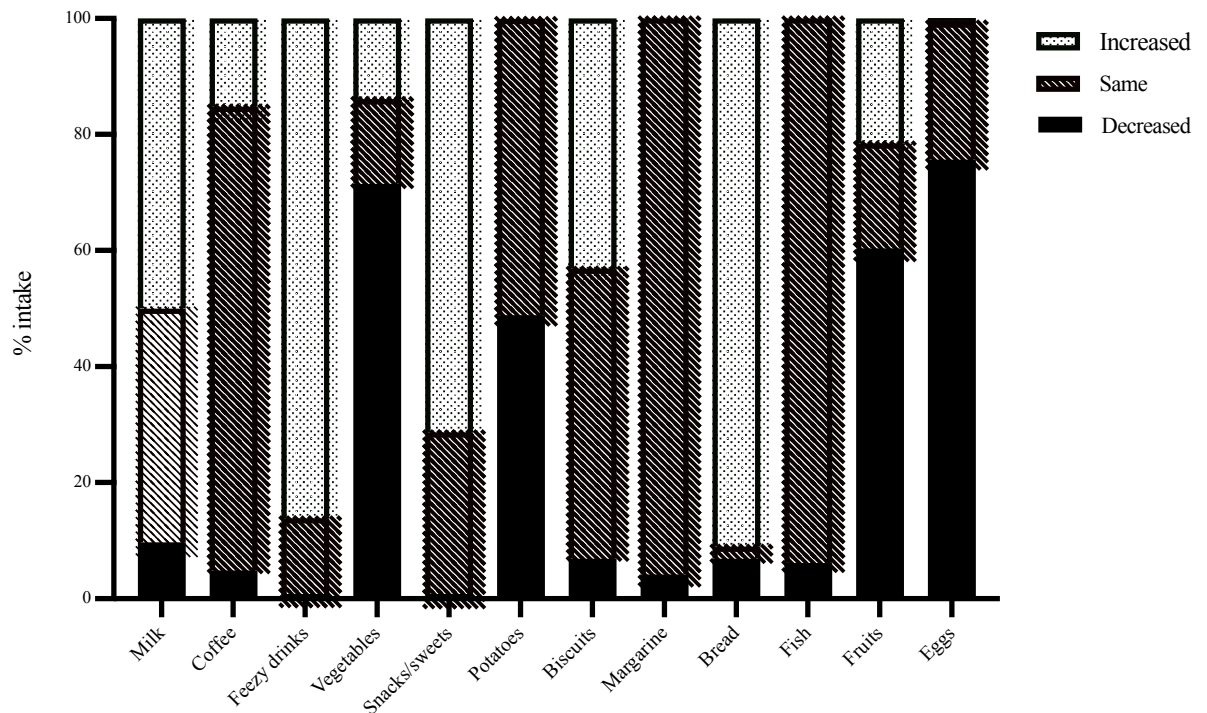
Figure 4 1 Consumption of various food groups during the COVID-19 lockdowns

Table 4. 2: Lifestyle patterns and physical activity among urban Harare residents during the COVID-19 lockdowns

	Total (N=144)	Female (N=103)	Male (N=41)	p-value
Ever used alcohol	45(31.3)	15 (14.6)	30(73.2)	<0.001
Current alcohol use	35(24.3)	10(9.7)	25(61.0)	<0.001
Frequency of alcohol use before lockdown (units/week)				0.380
≤ 3	18(51.4)	7(70)	11(44)	
4-5	11(31.4)	2(20)	9(36)	
≥6	6(17.1)	1(10)	5(20)	
Frequency of alcohol use during lockdown (units/week)				0.072
≤ 3	14(40)	7(70)	7(28)	
4-5	14(40)	2(20)	12(48)	
≥6	7(20)	1(10)	6(36)	
Ever smoked	10(6.9)	0	10(24.4)	<0.001
Current smoking status	12 (8.3)	1(1)	11(26.8)	<0.001
Have more than four meals during lockdowns	81(56.3)	49(47.6)	32(78.0)	<0.001
Overall increase in junk food	37(25.7)	23(22.3)	14(34.1)	0.137

	Total (N=144)	Female (N=103)	Male (N=41)	p-value
Physical performance				
Working from home	54(80)	41(82)	13(76.7)	0.216
Mode of transport among those going to work				0.237
Driving	3(23.1)	1(11.1)	2(50)	
Cycling	5(38.5)	3(33.3)	2(50)	
Public transport	2(15.4)	2(22.2)	0	
On foot	3(23.1)	3(33.3)	0	
Used a gym before lockdown	29(20.1)	17(16.5)	12(29.3)	0.107
Perform any vigorous physical activity	10(6.9)	5(4.9)	5(12.2)	0.252
Perform any moderate physical activity	32(22.2)	21(20.4)	11(26.8)	0.044
Perform less than 150 mins/week	56(38.9)	42(40.8)	14(34.2)	0.195

Table 4. 3: Clinical history and access to health services among participants

	Total (N=144)	Female (N=103)	Male (N=41)	p-value
Current NCDs, n(%)				
Hypertension	55(38.2)	45(43.7)	10(24.4)	0.031
Diabetes	22(15.3)	15(14.6)	7(17.1)	0.706
Heart disease	6(4.2)	6(5.8)	0	-
Chest pains	14(9.7)	11(10.7)	3(7.3)	0.826
High cholesterol	2(1.4)	2(1.9)	0	-
At least one NCDs	67(46.5)	54(52.4)	13(31.7)	0.024
Depression (Shona symptom questionnaire score)	6(4.2)	3(2.6)	3(6.0)	0.105
Current medications, n(%)				
Medication for hypertension	34(77.3)	25(80.7)	9(69.2)	0.449
Medication for diabetes	6(27.3)	5(33.3)	1(14.3)	0.616
Traditional medicine	54(37.5)	32(31.1)	22(53.7)	0.037
Availability of medication and access to health services during lockdown, n (%)				
Drugs and medication				0.099
Easily available	29(19.8)	17(16.5)	12(29.3)	
Moderately available	22(15.4)	14(13.6)	8(19.5)	
Not easily available	93(64.8)	72(69.9)	21(51.2)	
Doctors' appointment review visits				0.632
Easily available	23(16.0)	15(14.6)	8(19.5)	
Moderately available	18(12.5)	12(11.7)	6(14.6)	
Not easily available	103(71.5)	76(73.8)	27(65.9)	

All variables are presented as frequencies and percentages as stated
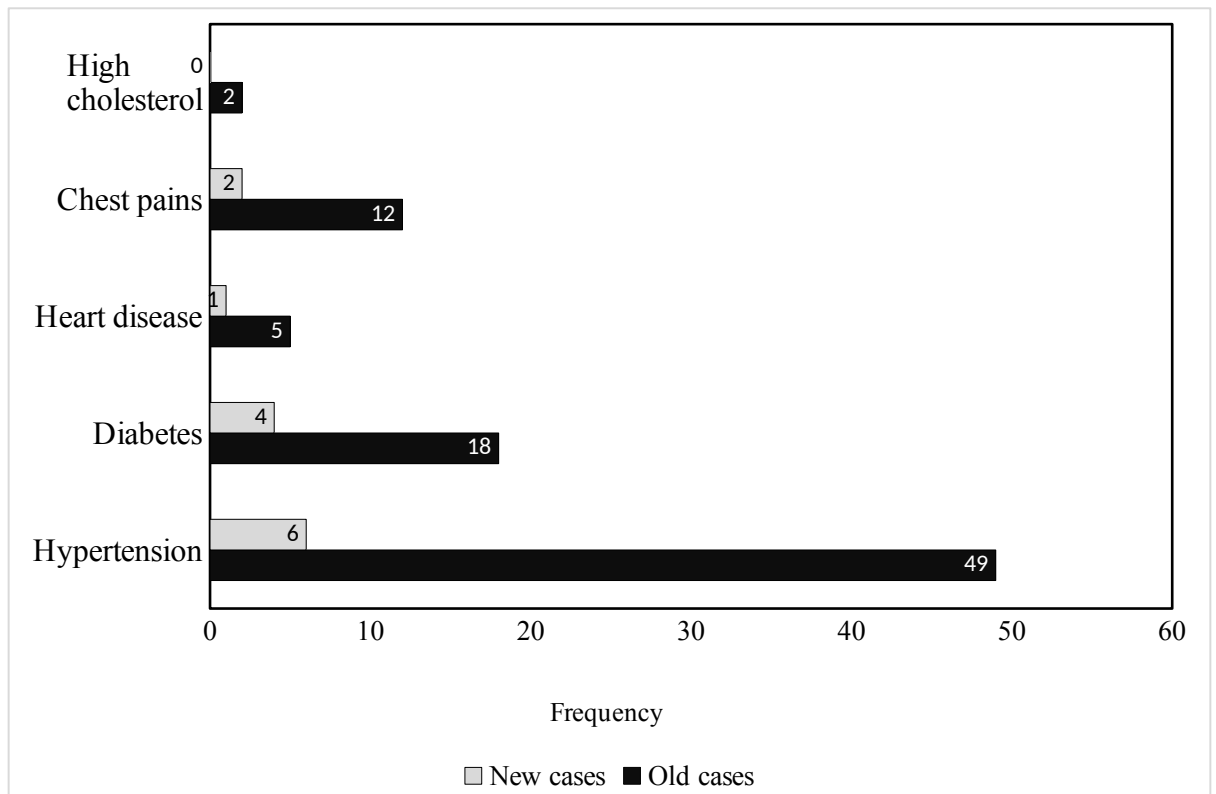
Figure 4 2 Overall prevalence and reported new cases for different NCDs
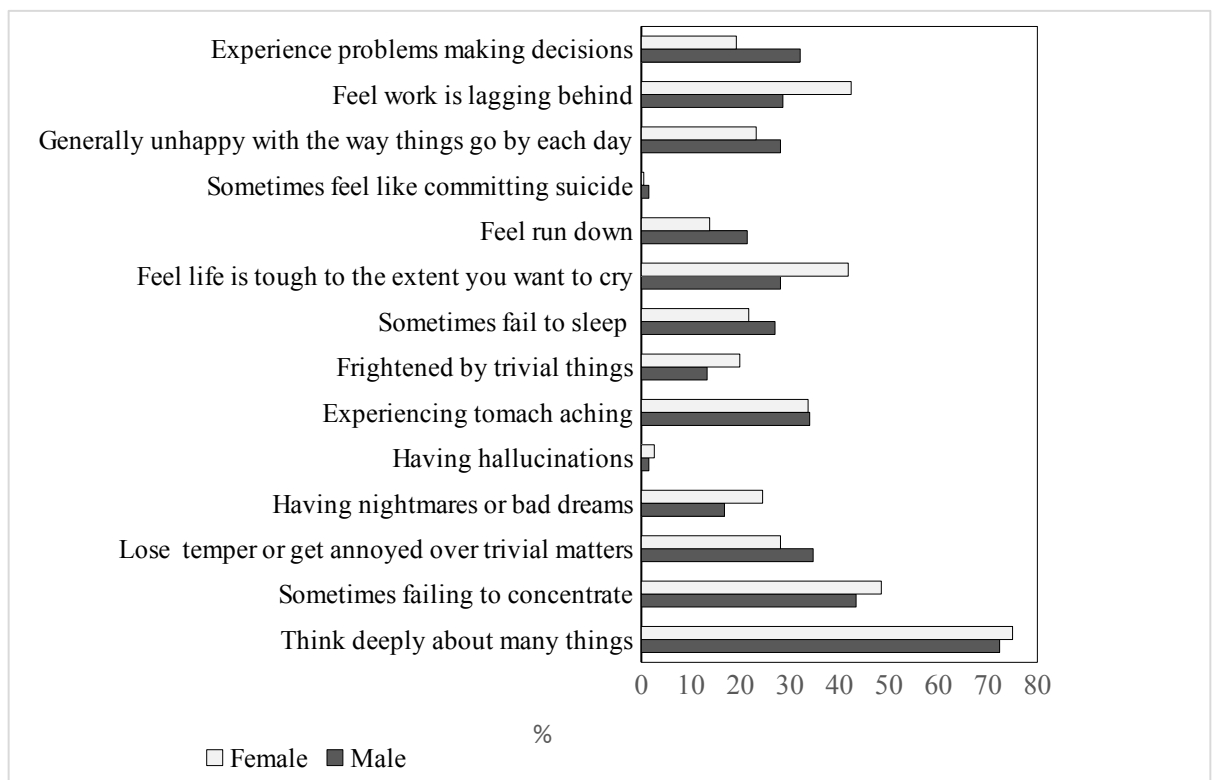
Figure 4 3 Levels of depression and anxiety during the COVID-19 lockdowns as measured by the Shona symptom questionnaire

Table 4 4: Demographics, and lockdown related factors associated with having at least one comorbidity

	At least one comorbidity			Unadjusted Odds ratio [95% CI]	p-value	Adjusted Odds ratio [95% CI]	p-value
	Total (n=144)	No (n=77)	Yes (n=67)				
Demographic characteristics							
Sex (Male)	41(28.5)	28(36.4)	13(19.4)	0.42[0.20, 0.90]	0.026	0.81[0.76, 0.94]	0.019
Age (≥ 50 years)	58(40.3)	31(40.3)	27(40.3)	1.01[0.51, 1.95]	0.996		
Employed	67(46.5)	37(48.1)	30(44.8)	0.88[0.45, 1.69]	0.694		
Alcohol use	45(31.3)	16(20.9)	27(40.3)	1.39[1.19, 1.82]	0.014	1.65[0.92, 2.17]	0.056
Smoking status	12(8.3)	5(6.0)	7(10.4)	1.55[0.15, 1.91]	0.344		
BMI	28.5(6.6)	27.4(6.2)	29.7(6.9)	1.06[1.01, 1.11]	0.038		
Perception of weight change							
Lost weight	36(25.3)	26(33.8)	10(14.9)	Ref		Ref	
Gained weight	66(45.7)	29(37.7)	37(55.2)	3.32[1.63, 4.32]	0.001	2.12[1.72, 3.12]	0.012
Did not change weight	42(29.0)	22(28.6)	20(29.9)	2.36[0.95, 5.76]	0.089	2.34[0.91, 4.88]	0.094
Access to medication and health services							
Drugs and medication							
Easily available	29(19.8)	21(27.3)	8(11.9)	Ref		Ref	
Moderately available	22(15.4)	17(22.1)	5(7.5)	0.77[0.56, 1.21]	0.060	0.86[0.51, 1.29]	0.123
Not easily available	93(64.8)	39(50.6)	54(80.6)	3.63[1.92, 4.56]	0.002	2.22[1.43, 3.11]	0.041
Doctors' appointment visits							
Easily available	23(16.0)	15(19.4)	8(11.9)	Ref			
Moderately available	18(12.5)	9(11.6)	9(13.4)	1.9[1.23, 2.31]	0.041	1.56[0.76, 1.56]	0.087
Not easily available	103(71.5)	53(68.8)	50(74.6)	1.8[1.34, 2.19]	0.031	1.61[1.03, 2.11]	0.046
Physical activity							
Lower than 150 mins/week	58(50.9)	29(48.3)	29(53.7)	1.24[0.59, 2.59]	0.567		
Consumption of various food groups							
Increase in milk intake	72(50)	43(55.8)	29(43.3)	0.60[0.31, 1.17]	0.134		
Reduced sugary drinks	20(13.9)	12(15.6)	8(11.9)	0.73[0.28, 1.92]			
Reduced eggs intake	109(75.6)	54(70.1)	55(82.1)	1.95[0.88, 4.31]	0.098	1.91[0.67, 4.29]	0.134

	At least one comorbidity			Unadjusted Odds ratio [95% CI]	p-value	Adjusted Odds ratio [95% CI]	p-value
	Total (n=144)	No (n=77)	Yes (n=67)				
Increase in vegetables	20(13.9)	14(18.2)	6(9.0)	0.57[0.16, 2.07]	0.395		

4.2 Discussion and interpretation

4.2.1 Participant recruitment

The study approached 170 participants in Glen View, Waterfalls, and Mt Pleasant from which, 26(15.3%) refused to participate for reasons including, lack of time and general disinterest in the study. Resultantly, 144 were enrolled into the study with an age range of 40-60 years

4.2.2 Participant's demographics and anthropometry characteristics

Of the 144 participants enrolled, the majority (N=103; 71.5%) of them were females aged on average 48.4(6.4) years and comparable to males. Likewise, most participants (N=89; 59.7%) were aged between 40-49 years and this was similar in both males and females. However, there was an association between sex and highest education level attained with more male participants likely to have attained a tertiary education (N=11; 10.7% vs N=12; 29.3%). Further differences between the sex groups were also observed with respect to marital status with more women currently married (N=55; 53.4% vs N=14; 34.1%) and most of them (N=96; 93.2%) were pregnant at least once in their lifetime.

Just under fifty percent of the participants were employed (N=67; 46.5%) and there was no difference in the employment status by sex. On average, the participant's families had four people and only 5.7% reported ever receiving any lockdown support with most of it (N=5; 62.5%) was in financial donation. However, a considerable quarter of the study sample (N=36; 25.3%) also perceived to have lost weight with more males (N=12; 29.2%) than females (N=24; 23.3%) (Table 1).

4.2.3 Nutritional behavior during the COVID-19 lockdown period

The figure shows various foods consumed among the study population and the perceived trend of intake during the lockdown period. An increased trend of consumption was observed in eight of twelve food items assessed in the study. Of note were major increases of at least 40% in bread (91%), sugary drinks (86%), snacks/sweets (71%), milk (50%) and biscuits (43%). Other notable increases were on vegetables (14%), coffee (15%) and fruits (21%). However, decreases were also distinctly reported on the following food items: eggs (76%), vegetables (72%), fruits (60%) and potatoes (49%). Impartially, the consumption of fish (94%), cheese (96%) and coffee (80%) remained the same during the lockdown period when compared to pre-pandemic period.

Overall, increases were recorded for sugary drinks, snacks/sweets, and bread, whilst decreases were on eggs, fruits and vegetables. More-so the consumption of other food items remained the same during this period.

4.2.4 Lifestyle patterns and physical activity among participants in Harare

All in all, 45% and 35% of the enrolled participants ever used alcohol or were currently using alcohol respectively, though this was more pronounced in males than females. There was evidence that shows increase in alcohol consumption with those consuming at least four units per week increasing from 17 to 21 before and during lockdown respectively. Notably, there was an increase in the number of participants currently smoke (N=12; 8.3%) from those who previously smoked (N=10; 6.9%) and only one was a female. There were notable increases in the number of people reporting increases in consumption of junk food.

The study also assessed the participants' perceived physical performance during the lockdown period, asking whether they engage in vigorous and or moderate physical activity. Overall, 80% of the participants worked from home and of the few that continued going to work, the majority cycled. Almost 7% (N=10) of all participants mentioned that they perform vigorous physical activity. Though vigorous physical activity was more reported in men (N=5; 12.2%) than women (N=5; 4.9%), there was no statistical evidence to support existence of true differences. More-so, more men reported engaging in moderate physical activity than women (p=0.044) which was also reported in a fifth of all participants. More importantly just under 40% (N=56) of the participants performed any physical activities less than the recommended 150 minutes/week.

4.2.5 Reported NCDs, and access to health services

The study asked participants about their current health status with regards to comorbidities and over a third (N=55; 38.2%) reported having hypertension and this was different by gender. More specifically, more women (N=45; 43.7%) reported having hypertension than males (N=10; 24.4%). Other conditions that were reported no, with no association by sex include: diabetes (N=22; 15.3%), heart disease (N=6; 4.2%), chest pains (N=14; 9.7%) and high cholesterol (N=2; 1.4%). Overall, almost half of the participants (N=67; 46.5%) reported having at least one comorbidity and this was more reported by women (N=54; 52.4%) as compared to males (N=13; 31.7%). We evaluated the participants' depression levels during the lockdown period using the Shona symptom questionnaire with 14 items. The prevalence of depression as classified by the tool with a cut-off point of at least 10 out of 14 points was 4.2% and this was fairly similar in both groups (Table 2).

Just over three quarters of the participants with hypertension reported being on antihypertensive medication. However, just above a quarter of diabetic patients were on medication whilst a considerable number (N=54; 37.5%) reported using some traditional medicine; more men (N=22; 53.7%) reported taking traditional medicine than women (N=32; 31.1). The majority of participants (N=93; 64.8%) highlighted those drugs and medication were not easily available during the lockdown period and this was equally reported in both males and females. Though minimal, there was some evidence suggesting that men (N=12; 29.3%) somewhat found it relatively easy to access drugs and medication than women (N=17; 16.5%). Likewise, men also found it easier to get a doctor's appointment regardless of the lockdown whilst women were more restricted. However, more participants regarded doctor's appointments as difficult to attain (N=103; 71.5%) as compared to access to drugs and medication (N=93; 64.8%) (Table 2).

4.2.6 Incidence of NCDS

The study has evaluated reported new cases of different NCDs and identified that, the highest number of new cases were for hypertension (N=6), followed by diabetes (N=4), chest pains (N=2) and heart disease (N=1).

4.2.7 Assessing COVID-19 lockdown induced depression

Using the Shona symptom and classifying a total score of at least ten as an indication of depression, we report that 4.2% of the participants were depressed (Table 2). We also looked at the 14 individual components of the questionnaire by sex to identify how the two groups were affected. Firstly, the majority (almost 70%) of the participants mentioned that often during this period, they think deeply about many things and this was reported comparably in both men and women. Secondly, over 40% of the study sample highlighted that they sometimes fail to concentrate, and this

was minutely more reported in women than men. Thirdly, almost 30% reported having a feeling that life is unbearably tough with significantly more women mentioning it. Likewise, more women felt their work was lagging. On the other hand, during the lockdown period, more male participants highlighted their struggles with (i) making decisions (ii) sadness (iii) insomnia (iv) short temper (v) tiredness. We also report that less than 10% of participants felt suicidal or hallucinating.

4.2.8 Covid-19 related factors and risk of comorbidities

The study looked at factors associated with having at least one comorbid condition reporting unadjusted and adjusted odds ratios.

4.2.9 Univariate analysis

Less men had at least comorbid conditions (N=13; 19.4%), resultantly, men were adjustably 52% less likely to have a comorbid condition as compared to females. Likewise, participants who reported alcohol use had an unadjusted odds ratio of 1.4 [95% CI: 1.19, 1.82] times more to have a comorbid condition than those who did not use alcohol. More-so, participants who perceived, gaining weight had an unadjusted odds ratio 3.3[95% CI: 1.63, 4.32] more than those who perceived losing weight. Other factors associated with having comorbid conditions include not being able to access drugs and medication (OR=3.6; 95% CI: 1.92, 4.56) and not easily getting doctor's appointment visit (OR=1.8; 95% CI: 1.34, 2.19).

4.2.10 Multivariate analysis

After controlling for potential confounders and effect modifiers, male participants were adjustably 19% less likely to have comorbid conditions as compared to females [OR=0.8; 95% CI: 0.76, 0.94]. Though the adjusted effect of using alcohol was strengthened in the multivariate model, the statistical evidence was minimal with

participants using alcohol 65% more likely to report a comorbid condition. Furthermore, the effect of perceived weight gain on the outcome was attenuated; adjustably, they were 2.1[95% CI:1.72, 3.12] times more likely to report at least one comorbidity. After adjustments, participants with difficult in (i) accessing medications and drugs (ii) having a doctors' appointment were adjustably 2.2[95% CI: 1.43, 3.11] and 1.6[9%% CI: 1.03, 2.11] times more likely to have a comorbid condition.

4.3 Chapter Summary

The results showed that majority of participants recruited were females. Results also showed that overall increases were recorded for sugary drinks, snacks/sweets, and bread, whilst decreases were on eggs, fruits and vegetables. More-so the consumption of other food items remained the same during this period. Overall, 80% of the participants worked from home and of the few that continued going to work, the majority cycled. More men reported engaging in moderate physical activity than women which was also reported in a fifth of all participants. Just over three quarters of the participants with hypertension reported being on antihypertensive medication. More specifically, more women reported having hypertension than males. Men also found it easier to get a doctor's appointment regardless of the lockdown whilst women were more restricted. However, more participants regarded doctor's appointments as difficult to attain. Results from the study showed that the majority of the participants mentioned that often during this period of the lockdown, they think deeply about many things and this was reported comparably in both men and women. We also identified that women were more likely to report an NCD as compared to men.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The study set out to assess the nutritional and lifestyle habits during the COVID-19 lockdown. This section therefore discusses the findings by the researcher and compare with previous findings by other researchers. The section also provides possible reasons for the findings that were found in the research and closes off by concluding the research and giving possible recommendations for other researchers to proceed from.

5.1 Demographics

Of the 144 participants enrolled 71.5% of them were females aged 48.4 on average compared to males. This shows that more females were willing to participate in the study than males.in a similar study conducted in Kosovo also indicated a higher participation of females than males with 79% females participating compared to 21% males, (Sulejmani et al., 2021). Most participants were aged between 40-49 years which was similar to both males and females. This is the most active group both at work and at home amongst the age group recruited for the research. On education status, majority of the participants had attained up to secondary education amongst these, 74.8% of them were females. Of the 144 participants, 67 of them were employed, amongst these, 48.5% of them were females.

5.2 Nutritional Habits

An increased trend of consumption observed in eight to twelve food items assessed in the study. Major increase was bread 91%, sugary drinks 86%, snacks 71%, milk 50% and biscuits 43%. A decrease was noted on eggs, 76%, vegetables 72%, fruits 60% and potatoes 49%. Majority of the participants increased the meals they had per day

(56.3%) than they usually did before the lockdown. The results from the participants was mainly because of working from home as most of the participants were working from home as highlighted in the results. Most participants highlighted that when at home they tend to eat more than when at work.

Of the participants who had more meals per day, they indicated that when they are at work, they skip either breakfast of lunch but ever since they started to work from home they never skipped a meal, this was also noted in a study by Ismail *et al,* 2020, where the amount of skipping meals reduced in the confinement, (Ismail et al., 2020). The participants who reduced on vegetables and fruits indicated that there was quite a hustle in order to purchase goods from grocery shops since the operating times had been adjusted to close earlier than they usually did. Therefore, individuals would go to the grocery shops at least once a week or once in two weeks yet vegetables and fruits are perishable goods that require frequent shopping.

To purchase goods at grocery shops, one had to wait in a long queue as shop owners would require a limited number of individuals per given time to reduce head count and minimize the chances of COVID-19 transmission. However, a study conducted among 3219 US participants showed that 32.3% of household food were insecure since COVID-19, with 35.5% of them classified as newly food insecure, (Ngoc & Kriengsinyos, 2020). The study indicated that people who experienced a job loss were at higher odds of experiencing food insecurity with an odds ratio of 3.06. Hence, there were potential and relevant impacts between food insecurity and individual economic. In the same context, COVID-19 lockdowns have also boosted the unemployment rate globally, which has resulted in millions of people losing access to employment.

Such dietary changes in populations were also noted in a study by Grant et al on-eating habits during the COVID-19 lockdown in Italy, where there was an unfavorable changes with excessive consumption of sweets or pastries and lack of physical activity, (Grant et al., 2021). However, in the study there was also an improved quality of diet amongst the participants, increasing their consumption of fruit, 24.4%, vegetables by 28.5% compared to the current study where there was a reduced consumption of fruits and vegetables. In the Glen view and Waterfalls residential suburbs, it was noted that most vendors that supply vegetables and fruits had closed down during the lockdowns whereas they are the main suppliers of fruits and vegetables in the suburbs. This shutdown contributed to the poor consumption of the products amongst participants.

5.3 Lifestyle habits
5.3.1 Physical Activity

Of the participants, 7% mentioned that they performed vigorous physical activity with a significant difference between males and females, the males dominating. More males reported engaging in moderate physical activity than women p= 0.0044, which was also reported in a fifth of all participants performed any physical activities less than the recommended. A study by Biernat *et al*, 2015 on physical activity also indicated that analysis performed among active subjects showed that females, compared to males, were more frequently p<0.05 insufficiently inactive while males tended to meet more frequently the criteria for a high level of physical activity, (Biernat & Tomaszewski, 2015). Only 29 participants used a gym during the lockdown, of these 29 all of them had indoor gym facility at their homes as all the gyms had been shut down. They all had at least two equipment for the gym indoors.

Just under 50% of the participants were employed, n=67, 46.5% and there was no difference in employment status by sex. Of the 67 who were employed, 80% of them were working from home during the lockdown that is 54, of these, 41 were females and 13 were males. There was a significant difference of the females and males working from home with p=0.216. of the participants working from home, there was limited physical activity achieved during the period. The participants that were going to work, a significant difference was seen on the mode of transport used, majority being driving to work. Participants who were working from home highlighted that they usually exercise when they walk in town from bus terminuses, some at their work stations going up and down the stairs, some usually go into town during lunch hours and therefore these become part of the physical activity.

Civil servants who were amongst the participants being armed forces, indicated that they have sports days once a week and this is where they had their moderate to vigorous physical activity but since the lockdowns all these activities were brought to a halt. Amongst the participants who were unemployed, their physical activity either moderate of vigorous reduced and the responses differed amongst them. Some indicated that most of their physical activity was done when taking walks to church, to the shopping centers, getting into town doing several errands. Since the lockdown was announced, churches were banned, there was no public transport to town since most of the businesses had been shutdown except for the essential services therefore it became very difficult for individuals to move around therefore they stayed at home. The reduction in physical activity was also noted in a study by Rodrique *et al,* 2021, on physical and sedentary behavior in Spanish university students where university students reduced moderate by 29.5% and vigorous by 18.3% and increased sedentary time by 52.7%.

5.3.2 Alcohol consumption and smoking

45% and 35% of enrolled participants ever used alcohol or were currently using alcohol respectively, these were more pronounced in males than females. There was evidence that showed an increase in alcohol consumption with those consuming at least 4 pints per week increasing from 17 to 21 before lockdown and during lockdown respectively. There was an increase in the number of participants currently smoking n=12, 8.3% from those who previously smoked n=10, 6.9% and only one was a female.

Participants who increased alcohol consumption highlighted that it would ease their minds from thinking of the number of individuals that were dying from the pandemic and thinking of how they will survive. The increase was mainly to reduce chances of depression from the participants. The current COVID-19 pandemic, which is accompanied by anxiety and depression, may influence the amount of alcohol drunk. According to Ismail et al., lifestyle changes during COVID-19 lockdowns increase the risk of sedentary behavior, changes in smoking and alcohol consumption, and changes in sleeping habits (Ismail et al., 2020). This was also noticed in a study on changes in adult alcohol use and repercussions in the United States during the COVID-19 pandemic, which found that generally, alcohol use increased (Pollard et al., 2020).

5.3.3 Perceived weight gain and induced depression

36 (25.3%) of the recruited individuals thought they lost weight during the lockdown, while 66 thought they gained weight, with the majority of women (53%) and men (13%). 42 people thought they did not change weight, with the majority of women (26%) and men (16%). Of those with perceived weight gain, they indicated that the

weight gain may have resulted from the increased eating habits and sedentary lifestyle that they had adopted. Those that had perceived weight loss indicated that this may have been because of lower income as some of them are self-employed and during lockdown they businesses had been shut down. Some also believing the weight loss might have been brought up by the stress of the circumstances brought into light by the pandemic, anxiety and depression. A study conducted by Sanchez et al on Leading factors for weight gain during COVID-19 lockdowns in Spanish populations resulted in 44.5% individuals of the recruited population having a self-reported weight gain which was particularly because of the sedentary life style adopted during the lockdown, (Sánchez-Sánchez et al., 2020).

Using the Shona symptom and classifying a total score of at least ten as an indication of depression, we reported that 4.2% of the population were depressed. Majority of the participants thought deeply about many things, 70%. Over 40% failed to concentrate and 30% reported having feeling that life is unbearably tough with significantly more women mentioning it. On overall, these scores were mainly attributed to the fear of losing jobs during the lockdown as most companies had decongested workplaces so there was a risk of others not being called back at work. The idea of losing loved ones to COVID-19 was also the fear of everyone as the cases of infections and deaths rose by the day. Participants also mentioned that they always wondered when the pandemic will come to an end, will there be a cure for the infection eventually.

5.4 Incidence of NCDs and accessing of healthcare

38.2% of the participants reported having hypertension, more of them were females, 43.7% and males 24.4%. Most of the African women have an increased weight as

compared to the males, this is a risk of being obese and therefore having non-communicable diseases like hypertension and diabetes. This is mainly the reason why most of the women amongst populations have hypertension than males. In the African culture, being overweight is in most regions regarded as a sign of wealth or things are going well for individuals. Prevalence of hypertension has been seen in many studies being higher in women than in males. A study conducted in India on Prevalence of hypertension within central Indian rural communities resulted in prevalence being higher in females 23.4% than males 14.4%, (Kokiwar et al., 2012).

Just over three quarters of the participants with hypertension reported being on hypertensive medication. However, just above a quarter of diabetic patients were on medication whilst a considerable number reported using traditional medicine. 64.8% of the population recruited could not easily access medication during the lockdown and 71.5% could not easily get a doctor's appointment during the lockdown. During the lockdown, essential services such as pharmacies were allowed to operate, but they would close at three o'clock. The times they opened and closed were not flexible times for all individuals also considering they were decongesting buildings therefore only a certain number of patients were allowed inside at a given time.

According to the findings of an Indian study on the health, emotional, and economic implications of the COVID-19 pandemic on persons living with chronic diseases, 83 percent of people with chronic conditions had trouble getting healthcare, while 17 percent had problems accessing medication (Singh et al., 2020). Challenges in accessing healthcare and medicines may include transport, during the Zimbabwean lockdown, public transport was shutdown which made it very difficult for individuals who use public transport to travel. Most of the companies because of reduced working times, income was reduced as well and this may also have affected

individuals to access healthcare as most of them require cash up front and several shortfalls.

Incidence of NCDs was seen more on hypertension with six new cases recorded, diabetes recorded four new cases, heart disease one, chest pains 2 and no new cases on high cholesterol. These new cases of non-communicable diseases may have been attributed to by an increase in sugary foods and junk food, physical inactivity and difficulties to access healthcare facilities as these are the risk factors for development of non-communicable diseases.

5.5 Other factors related to NCDs
The study also identified that females were more often likely to report the occurrence of an NCD as compared to men. Other studies have confirmed this finding, and the World Health Organization has said that in Africa, more women per thousand die from NCDs than in high-income nations. However, some results have pointed to women's superior healthcare seeking behavior as a contributing factor to increased NCD rates. There is overwhelming evidence on the importance of access to quality healthcare towards control of diseases. During the Covid-19 lockdowns, lack of access to healthcare and medications could have contributed to uncontrolled NCDs and emergency of some, resulting in overall increase in the prevalence. The World Health Organization's Global Action Plan for the Prevention and Control of NCDs 2013–2020 includes a target of '80 percent availability of affordable rudimentary technologies as well as essential medicines, of which generics make up a significant portion, that are essential to the treatment of major NCDs in both private and public facilities.

5.6 Limitations

The main limitation of the study was a small sample size. This was mainly because of lack of financial support. With financial support, researcher could have recruited more participants so as to have a more representative sample size of the whole population. However, to overcome this, the researcher had to have all three suburbs representatives, low, middle and high-density suburbs included in the sample size.

5.7 Conclusion

In conclusion, results of this study showed evidence on the effect of lockdown on people's nutritional habits and lifestyles in the Harare urban. During the quarantine, individuals ate more generally, ate foods high in sugar, experienced changes in their weight, increased alcohol consumption, and were less active. Results also showed that these could have led to the occurrence of new cases of NCDs. We have also shown that lack of easily accessible health services, drugs and medications had a negative impact in both old and new NCD cases.

5.8 Recommendations

As a result of the findings of this study, the researcher would like to put forward the following recommendations for consideration by the Government of Zimbabwe, special attention being the Ministry of Health and Child Care, department of Human resources, information technology and department of Policy and planning to be considered with immediate effect:

5.8.1 Behavioural change communication

- From the findings, it was noted that individuals were not being cautious of what they eat, whether it is nutritious or not during the confinement. It is pivotal to inform public health policymakers to put up policies that speak on

healthy diets and lifestyle. Awareness campaigns should be done with immediate effect on radios, televisions, newspapers and any other media facility that can reach to populations. Printing of posters to be placed in all public areas that educate individuals should be implemented. The campaigns should clearly state out the negative consequences of unhealthy eating especially in a confinement where individuals are less active and socially and psychologically affected by the pandemic. For individuals that had challenges to purchase vegetables and fruits during confinements, there should be encouragement to at least plant vegetables in their backyards so that they will not have to eliminate them from their diet in future lockdowns because shops are not fully operational. People should invest in gardening, plant vegetables and various herbs that will complement their diet.

- Give nutrition education and skills- these include nutrition, cooking or food production skills on education curriculum; workplaces health schemes, health literacy programs. For health reasons, people should be able to learn different cooking techniques such as steaming and boiling.

5.8.2 Awareness regarding importance of home-based physical activity and stress relief mechanism

Findings indicate that individuals were not aware of the physical activity recommendations by WHO and therefore did not comply. Since majority of those who were employed were working from home, they had more of a sedentary lifestyle. They were not aware of the risks that they were exposing themselves by being physically inactive. Strategies fostering compliance with contemporary guidelines for sedentary behaviour, physical activity as well as sleep should be implemented; this can prove pivotal in cases of repeated and intermittent lockdown

and confinement measures. Ministry of education sports and culture should collaborate with Ministry of Health and Child Care and mobilise funds for educating the communities immediate so that no one is left behind on physical activity guidelines. Information should be disseminated on the radio, television and roadshows to educate the communities. This is particularly important for populations with chronic diseases, physical activity will help the body and mind to relax and avoid depression since the pandemic issues already caused depression in most populations hearing new cases of infections and death cases. Curriculums should align with the WHO guidelines on physical activity.

5.8.3 Introducing active e-health and telemedicine

The finding in the research revealed that individuals had challenges in accessing healthcare services and essential drugs during the lockdown, which therefore impacted on their health especially those with chronic conditions. Health services that are essential must continually be provided by stakeholders especially within communities notwithstanding the fact that the health system might be preoccupied with dealing with the COVID-19 virus in an attempt to prevent harm being caused to the public health in general as well as to contribute to the deterioration of patients medical conditions. Telemedicine therefore acts as a guarantee for the continuation of medical treatment while also providing reduction of the transmission of the COVID-19 virus. Majority of enrolled participants could not easily get a doctor's appointment and could not easily get essential drugs. With e-health and telemedicine, there would not have been an interruption and providing service to the citizens.

The Department of Information systems under the Ministry of health should seek finance from the Financing department to upgrade their department and make sure

that necessary departments are equipped to undergo the e-health and telemedicine. There should be interoperability amongst hospital units so that patients do not move around during lockdowns from one unit to another, rather all the information should be on their portal. This would particularly benefit patients that are on chronic medicines that need to take a monthly supply at a given time. There is no risk of patients defaulting the use of their medicines and thus improving health. Telemedicine allows patients to communicate with their doctors remotely. Have their consultations online without necessarily travelling to the healthcare facility especially in lockdowns where there is limited movement.

5.9 Suggestions for further research

The findings presented in this study are not exhaustive of issues affecting populations in confinements or pandemics. Further research can be conducted on the following broad areas.

i. Knowledge, attitudes and practices of physical activity in populations, adherence to the WHO guidelines

ii. Knowledge of NCDs' risk factor among populations

iii. Strategies to promote awareness to the public on health eating and lifestyle

REFERENCES

Abraham, H., Haileamlak, A., & Health, C. (2012). *Physical Inactivity : The Major Risk Factor for Non-Communicable Diseases*. 4314.

Ahmed, S. A. K. S., Ajisola, M., Azeem, K., Bakibinga, P., Chen, Y.-F., Choudhury, N. N., Fayehun, O., Griffiths, F., Harris, B., Kibe, P., Lilford, R. J., Omigbodun, A., Rizvi, N., Sartori, J., Smith, S., Watson, S. I., Wilson, R., Yeboah, G., Aujla, N., … Yusuf, R. (2020). Impact of the societal response to COVID-19 on access to healthcare for non-COVID-19 health issues in slum communities of Bangladesh, Kenya, Nigeria and Pakistan: results of pre-COVID and COVID-19 lockdown stakeholder engagements. *BMJ Global Health*, *5*(8), e003042. https://doi.org/10.1136/bmjgh-2020-003042

Awucha, N. E., Janefrances, O. C., Meshach, A. C., Henrietta, J. C., Daniel, A. I., & Chidiebere, N. E. (2020). Impact of the COVID-19 pandemic on consumers' access to essential medicines in Nigeria. *American Journal of Tropical Medicine and Hygiene*, *103*(4), 1630–1634. https://doi.org/10.4269/ajtmh.20-0838

Biernat, E., & Tomaszewski, P. (2015). *Association of socio-economic and demographic factors with physical activity of males and females*. *22*(1), 118–123. https://doi.org/10.5604/12321966.1141380

Cheikh Ismail, L., Osaili, T. M., Mohamad, M. N., Al Marzouqi, A., Jarrar, A. H., Zampelas, A., Habib-Mourad, C., Omar Abu Jamous, Di., Ali, H. I., Al Sabbah, H., Hasan, H., Almarzooqi, L. M. R., Stojanovska, L., Hashim, M., Shaker Obaid, R. R., Elfeky, S., Saleh, S. T., Shawar, Z. A. M., & Al Dhaheri, A. S. (2021). Assessment of eating habits and lifestyle during the coronavirus 2019 pandemic in the Middle East and North Africa region: A cross-sectional study. *British Journal of Nutrition*, *126*(5), 757–766. https://doi.org/10.1017/S0007114520004547

Di, A., Id, C., Id, I. C., Marchetti, D., La, P., Id, M., Maiella, R., Id, L. C., Cipi, M., Mammarella, N., Palumbo, R., Verrocchio, M. C., Id, R. P., & Di, A. (2021). *Psychological factors and consumer behavior during the COVID-19 pandemic*. *2019*(December 2019), 1–23. https://doi.org/10.1371/journal.pone.0256095

Di Renzo, L., Gualtieri, P., Pivari, F., Soldati, L., Attinà, A., Cinelli, G., Cinelli, G., Leggeri, C., Caparello, G., Barrea, L., Scerbo, F., Esposito, E., & De Lorenzo, A. (2020). Eating habits and lifestyle changes during COVID-19 lockdown: An Italian survey. *Journal of Translational Medicine*, *18*(1), 1–15. https://doi.org/10.1186/s12967-020-02399-5

Drieskens, S., Berger, N., Vandevijvere, S., Gisle, L., Braekman, E., Charafeddine, R., De Ridder, K., & Demarest, S. (2021). Short-term impact of the COVID-19 confinement measures on health behaviours and weight gain among adults in Belgium. *Archives of Public Health*, *79*(1), 1–10. https://doi.org/10.1186/s13690-021-00542-2

Gebremariam, L. W., Aoyama, A., & Kahsay, A. B. (2018). *Perception and practice of ' healthy ' diet in relation to noncommunicable diseases among the urban*

and rural people in northern Ethiopia : a community-based qualitative study. 451–464. https://doi.org/10.18999/nagjms.80.4.451

Gouda, H. N., Charlson, F., Sorsdahl, K., Ahmadzada, S., Ferrari, A. J., Erskine, H., Leung, J., Santamauro, D., Lund, C., Aminde, L. N., Mayosi, B. M., Kengne, A. P., Harris, M., Achoki, T., Wiysonge, C. S., Stein, D. J., & Whiteford, H. (2019). Burden of non-communicable diseases in sub-Saharan Africa, 1990–2017: results from the Global Burden of Disease Study 2017. *The Lancet Global Health*, *7*(10), e1375–e1387. https://doi.org/10.1016/S2214-109X(19)30374-2

Grant, F., Scalvedi, M. L., Scognamiglio, U., Turrini, A., & Rossi, L. (2021). Eating habits during the covid-19 lockdown in italy: The nutritional and lifestyle side effects of the pandemic. *Nutrients*, *13*(7). https://doi.org/10.3390/nu13072279

Hawkes, C., Jewell, J., & Allen, K. (2013). *A food policy package for healthy diets and the prevention of obesity and diet-related non-communicable diseases : the NOURISHING framework. 14*(November), 159–168. https://doi.org/10.1111/obr.12098

Ismail, L. C., Osaili, T. M., Mohamad, M. N., Marzouqi, A. Al, Jarrar, A. H., Jamous, D. O. A., Magriplis, E., Ali, H. I., Sabbah, H. Al, Hasan, H., Almarzooqi, L. M. R., Stojanovska, L., Hashim, M., Obaid, R. R. S., Saleh, S. T., & Dhaheri, A. S. A. (2020). Eating habits and lifestyle during covid-19 lockdown in the united arab emirates: A cross-sectional study. *Nutrients*, *12*(11), 1–20. https://doi.org/10.3390/nu12113314

Kluge, H. H. P., Wickramasinghe, K., Rippin, H. L., Mendes, R., Peters, D. H., Kontsevaya, A., & Breda, J. (2020). Prevention and control of non-communicable diseases in the COVID-19 response. *The Lancet*, *395*(10238), 1678–1680. https://doi.org/10.1016/S0140-6736(20)31067-9

Kokiwar, P. R., Gupta, S. S., & Durge, P. M. (2012). Prevalence of hypertension in a rural community of Central India. *Journal of Association of Physicians of India*, *60*(6), 26–29.

Laar, A., Barnes, A., Aryeetey, R., Tandoh, A., Bash, K., Mensah, K., Zotor, F., Vandevijvere, S., & Holdsworth, M. (2020). Implementation of healthy food environment policies to prevent nutrition- related non-communicable diseases in Ghana : National experts ' assessment of government action. *Food Policy*, *93*(April 2019), 101907. https://doi.org/10.1016/j.foodpol.2020.101907

Luciano, F., Cenacchi, V., Vegro, V., & Pavei, G. (2021). COVID-19 lockdown: Physical activity, sedentary behaviour and sleep in Italian medicine students. *European Journal of Sport Science*, *21*(10), 1459–1468. https://doi.org/10.1080/17461391.2020.1842910

Matenga, J. A., Allain, T. J., Wilson, A. O., Adamchak, D. J., Senzanje, B., Mushangi, E., & Gomo, Z. (1997). Hypertension management in Zimbabwe - Awareness, treatment and blood pressure control. A community-based study. *South African Medical Journal*, *87*(10), 1371–1373.

Mutowo, M. P. (2015). Hypertension in Zimbabwe: A meta-analysis to quantify its

burden and policy implications. *World Journal of Meta-Analysis*, *3*(1), 54. https://doi.org/10.13105/wjma.v3.i1.54

Ngoc, H. N., & Kriengsinyos, W. (2020). Impacts of COVID-19 Pandemic and Its Lockdown on Global Eating Behavior : A Google Trends Analysis. *Preprints*, *December*, 1–30. https://doi.org/10.20944/preprints202012.0701.v1

Ogunleye, O. O., Basu, D., Mueller, D., Sneddon, J., Seaton, R. A., Yinka-Ogunleye, A. F., Wamboga, J., Miljković, N., Mwita, J. C., Rwegerera, G. M., Massele, A., Patrick, O., Niba, L. L., Nsaikila, M., Rashed, W. M., Hussein, M. A., Hegazy, R., Amu, A. A., Boahen-Boaten, B. B., … Godman, B. (2020). Response to the Novel Corona Virus (COVID-19) Pandemic Across Africa: Successes, Challenges, and Implications for the Future. *Frontiers in Pharmacology*, *11*(September), 1–36. https://doi.org/10.3389/fphar.2020.01205

Pati, S., Mahapatra, P., Kanungo, S., Uddin, A., & Sahoo, K. C. (2021). Managing Multimorbidity (Multiple Chronic Diseases) Amid COVID-19 Pandemic: A Community Based Study From Odisha, India. *Frontiers in Public Health*, *8*(February), 1–9. https://doi.org/10.3389/fpubh.2020.584408

Sánchez-Sánchez, E., Ramírez-Vargas, G., Avellaneda-López, Y., Orellana-Pecino, J. I., García-Marín, E., & Díaz-Jimenez, J. (2020). Eating habits and physical activity of the spanish population during the covid-19 pandemic period. *Nutrients*, *12*(9), 1–12. https://doi.org/10.3390/nu12092826

Singh, K., Kondal, D., Mohan, S., Jaganathan, S., Mohan, D., Venkateshmurthy, N. S., Jarhyan, P., Mohan, A. R., Mohan, V., Narayan, K. M. V., Prabhakaran, D., Ali, M. K., Tandon, N., & Eggleston, K. (2020). Health, Psychosocial, and Economic Impacts of the Covid-19 Pandemic on People with Chronic Conditions in India: A Mixed Methods Study. *SSRN Electronic Journal*, 1–15. https://doi.org/10.2139/ssrn.3738624

Stockwell, S., Trott, M., Tully, M., Shin, J., Barnett, Y., Butler, L., McDermott, D., Schuch, F., & Smith, L. (2021). Changes in physical activity and sedentary behaviours from before to during the COVID-19 pandemic lockdown: A systematic review. *BMJ Open Sport and Exercise Medicine*, *7*(1), 1–8. https://doi.org/10.1136/bmjsem-2020-000960

Sulejmani, E., Hyseni, A., Xhabiri, G., & Rodríguez-p, C. (2021). *Relationship in dietary habits variations during COVID-19 lockdown in Kosovo : The COVIDiet study*. *164*(April). https://doi.org/10.1016/j.appet.2021.105244

Villena-esponera, M. P., Moreno-ortega, A., & Baquero, R. A. (2021). *Covid 19 : Eating behavior changes related to individual and household factors during the COVID-19 lockdown in Spain*. *71*(1), 13–27. https://doi.org/10.37527/2021.71.1.002

WHO. (2020). COVID-19 and NCDs. *World Health Organization*, 5. https://www.who.int/docs/default-source/ncds/ncd-covid-19/for-web---rapid-assessment---29-may-2020-(cleared).pdf?sfvrsn=6296324c_14&download=true

Willett, W. C., & Stampfer, M. J. (2013). *Current Evidence on Healthy Eating*.

APPENDICES

APPENDIX 1 1: AUREC Approval

AFRICA UNIVERSITY

A United Methodist-Related Institution

Investing in Africa's future

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 website: www.africau.edu

Ref: AU2319/22   18 January, 2022

Faith Mugugu
C/O CHANS
Africa University
Box 1320
<u>Mutare</u>

RE: <u>NUTRITIONAL AND LIFESTYLE HABITS AMONGST ADULTS IN URBAN
     HARARE, ZIMBABWE DURING THE COVID-19 LOCKDOWN</u>

Thank you for the above titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.
a) Research proposal
b) Data collection instruments
c) Informed consent guide
- **APPROVAL NUMBER**   AUREC 2319/22
  This number should be used on all correspondences, consent forms, and appropriate documents.
- **AUREC MEETING DATE**   NA
- **APPROVAL DATE**   January 18, 2022
- **EXPIRATION DATE**   January 18, 2023
- **TYPE OF MEETING**   Expedited
  After the expiration date this research may only continue upon renewal. For purposes of renewal, a progress report on a standard AUREC form should be submitted a month before expiration date.
- **SERIOUS ADVERSE EVENTS** All serious problems having to do with subject safety must be reported to AUREC within 3 working days on standard AUREC form.
- **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
- **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC.

AFRICA UNIVERSITY
RESEARCH ETHICS COMMITTEE (AUREC)

APPROVED
P.O. BOX 1320, MUTARE, ZIMBABWE

Yours Faithfully

MARY CHINZOU –
ASSISTANT RESEARCH OFFICER: FOR CHAIRPERSON
<u>AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE</u>

APPENDIX 1 2: Questionnaire [English Version]

Section A Demographic characteristics

1. What is your age group?

    ☐ 40-45   ☐ 46-52   ☐ 53-59   ☐ 60-65   ☐ 65+

2. What is your gender

☐ Male   ☐ female

3. What is your highest level of education?

 ☐ Primary   ☐ Secondary ☐ Tertiary   ☐ Did not attend school

4. Marital Status

    ☐ Single   ☐ Married   ☐ Divorced   ☐ widowed

5. Employment Status

    ☐ Formally employed   ☐ Self-employed   ☐ informally employed

        ☐ Not employed

6. What is your average monthly income?

    ☐ below US$200   ☐ US$300-US$400   ☐ Above US$500

7. How many leave on this income?

    ☐ Below 3   ☐ 4   ☐ 5   ☐ 6 and above

Section B Lifestyle factors

1. a) How much fruit did you eat in an average day before the lockdown?

    ☐ 1   ☐ 2 or more   ☐ none

b) How much fruit did you eat in an average day during the lockdown?

☐ 1   ☐ 2 or more   ☐ none

2. Did your vegetable intake change during the lockdown?

☐ YES   ☐ NO

3. a) What was your daily intake of carbonated drinks before lockdown?

☐ 1   ☐ 2 or more   ☐ none

b) What was your daily intake of carbonated drinks before lockdown?

☐ 1   ☐ 2 or more   ☐ none

4. Do you smoke?

☐ YES   ☐ NO

5. a) If yes, how many cigars a day before the lockdown?

☐ Below 3   ☐ 4   ☐ 5   ☐ 6 and above

b) If yes, how many cigars a day during the lockdown?

☐ Below 3   ☐ 4   ☐ 5   ☐ 6 and above

6. Do you drink alcohol?

☐ YES   ☐ NO

a) If yes, how many pints a day before the lockdown?

☐ Below 3   ☐ 4   ☐ 5   ☐ 6 and above

b) If yes, how many pints a day during the lockdown?

7. Did you have more than 4 meals a day during the lockdown?

☐ YES   ☐ NO

8. Did you increase junk food in your diet during the lockdown?

☐ YES   ☐ NO

9. Did you increase weight during the lockdown?

☐ YES   ☐ NO

Section C Physical performance

1. Were you asked to work from home during the lockdown?

☐ YES   ☐ NO

2. If not, was there a schedule that rotated the employs to decongest the workplace?

☐ YES   ☐ NO

3. How many times a month did you go to work physically?

☐ 2 weeks   ☐ below 2 weeks   ☐ more than 2 weeks

4. What mode of transport did you use to go to work?

☐ driving   ☐ cycling   ☐ public transport   ☐ on foot

5. Did you go to the gym before the lockdown?

☐ YES   ☐ NO

6. Did you do any moderate-intensity sports, fitness or recreational *(leisure)* activities that causes a small increase in breathing or heart rate such as brisk walking during the lockdown?

☐ YES   ☐ NO

7. In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (*leisure*) activities?

☐ less than 2   ☐ 3 to 4   ☐ more than 5   ☐ none

8. Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging or construction work] for at least 10 minutes continuously?

☐ YES   ☐ NO

9. Did you spend more time sitting or reclining during the lockdown?

☐ YES   ☐ NO

Section D Clinical history

1. Did you have high cholesterol before the lockdown?

☐ YES   ☐ NO

2. If yes, did your doctor prescribe medication to help lower your cholesterol?

☐ YES   ☐ NO

3. Did you have high blood pressure before the lockdown?

☐ YES   ☐ NO

4. If yes, did your doctor prescribe medication to help lower your blood pressure?

☐ YES   ☐ NO

5. Did you have diabetes before the lockdown?

☐ YES   ☐ NO

6. If yes, did your doctor prescribe medication to help lower your sugar levels?

☐ YES   ☐ NO

7. From the lockdown to date have you been diagnosed of diabetes, High blood pressure, high cholesterol or heart problem?

☐ YES   ☐ NO

APPENDIX 1 3: Questionnaire [Shona Questionnaire]

Section A Hunhu hwevanhu

1. Cherechedza

☐ Murume   ☐ Mukadzi

2. Makazvarwa gore ripi?

3. Mune makore mangani?

4. Makasvika parugwaro rwupi kuchikoro?

☐ Primary   ☐ Secondary ☐ Tertiary   ☐ Did not attend school

5. Makaroora kana kuroorwa here
    ☐ Handina kuroora kana kuroorwa ☐ Ndakaroora/kuroorwa   ☐
    Takasiyana   ☐ Ndakafirwa

6. Munoenda kubasa here

    ☐ Ndinoshanda zviripamutemo   ☐ ndinoita mabasa emaoko   ☐
    Ndinewo kwandinobata bata ☐Handina kubasa kwandinoenda

7. Munowana zvakadini pamwedzi?
    ☐ pasi pe US$200   ☐ pakati peUS$300-US$400 ☐ pamusoro US$500

8. Mune vanhu vangani vanoraramiswa nemari yamunowana pamwedzi?

    ☐ Pasi pevatatu   ☐ vana   ☐ vashanu   ☐ vatanhatu zvichikwira

SECTION B Mararamiro

7. Munodya michero here ☐ Hongu   ☐ Kwete

8. a) Maidya michero mingano pazuva pasati paita zvisungo zve Covid 19

    ☐ Mumwe   ☐ Maviri kana kudarika   ☐ Hapana
    b) Maidya michero mingani pazuva kubva pakatqnga zvisungo zve Covid 19
    ☐ Mumwe chete   ☐ mairi kana kudarika   ☐ Hapana

9. Munodya ma vheji here ☐ Hongu   ☐ Kwete

10. Munodya mavheji kakawanda zvakadini? ☐ Nguva dzese ☐ dzimwe nguva
☐ Handicharangarira

11. Kudya kwamunoita mavheji kwachinja here kubva kutanga kwezvisungo zve Covid 19

☐ Hongu ☐ Kwetw ☐ Handicharangarira

12. Kana muchiti hongu, zvakaderera here kana kuwedzera ☐ kuwedzera ☐ kuderera

13. Ndezvipi zvinwiwa zvamainwa mazuva mazhinji? Sarudzai pane zvakanyorwa pasi apa

☐ Coffee ☐ Tea ☐ Juice ☐Regular soda ☐Diet soda ☐Water Mvura
☐ Mukaka Milk: Whole 2% 1% Nonfat (skim) ☐ Doro Alcohol ☐ Zvimwewo

14. a)Mainwa kakawanda zvakadini pazuva pazvinwiwa zvamasarudza pasati pava nezvisungo zve Covid 19

☐ kamwechete ☐ kaviri kana kudarika ☐ hapana

15. b)? Mainwa kakawanda zvakadini pazuva pazvinwiwa zvamasarudza kubva pakatanga zvisungo zve Covid 19

☐ kamwechete ☐ kaviri kana kudarika ☐ hapana

16. Munoputa fodya here?
☐ Hongu ☐ Kwete

17. a) Maiputa fodya ngani pasati patanga zvisungo zve Covid19

☐ Pasi pe nhatu ☐ mina ☐ mishanu ☐ mitanhatu zvichikwira

b) Midzanga mingani pazuva kubva zvakatanga zvisungo zve Covid 19

☐ Pasi pemitatu ☐ Mina ☐ Mishanu ☐ Mitanhatu zvichikwira

18. Munodya chikafu kangani pazuva?

☐ kamwechete ☐ kaviri ☐ katatu ☐ kana zvichikwira

9. Maidya chikafu kanodarika kana here kubva zvakatanga zvisungo zve Covid19

☐ Hongu   ☐ Kwete   ☐ Handicharangarira

19. Munodya zvikafu zvenhando here

☐ hongu   ☐ kwete

20. Munodya kangani ☐ Nguva dzese   ☐   Dzimwe   nguva   ☐ Handicharangarira

21. Makawedzera here kudyq kwenhando kubva zvakatanga zvisungo zve Covid 19

☐ Hongu   ☐ kwete   ☐ handicharangarira

10. Makawedzera huremu hwemumuviri here kubva zvakatanga zvisungo zve Covid 19

☐ Hongu   ☐ Kwete   ☐ Handicharangarira

Section C Physical performance

10. Maitarisirwa kushanda murikumba here kubva zvakatanga zvisungo zve Covid 19

☐ Hongu   ☐ Kwete

11. Kana pasina, paiva here nehurongwa hwekuti vashandi vauye pakasiya siyana pabasa

☐ Hongu   ☐ Kwete

12. Makaenda kangani kubasa pamwedzi

☐ Masvondo maviri ☐ Pasi pemasvondo maviri ☐ kudarika masvondo maviri

13. Maishandisei senzira dzekufambisa pakuenda kubasa

☐ nemota   ☐ Bhasikoro ☐ Mabhazi eruzhinji ☐ kufamba netsoka

14. Maienda here ku gymn kubva zvakatanga zvisungo zve Covid 19

☐ hongu   ☐ kwete

15. Maienda kangani kugym ☐ Nguva nenguva☐ Dzimwe   nguva   ☐ Handicharangarira

16. Mune mitambo yamaiita yekusimbisa muviri kana kufara yaiita kuti mufemere pamusoro kana kuti hana irove zvakawedzera yakafanana nekufambisa munguva yezvisungo zve Covid 19

☐ Hongu   ☐ Kwete   ☐ Handicharangarira

17. Pasvondo, mazuva mangani amunoita mitambo yekusimbisa miviri kana kufara ?

☐ Pasi pemaviri   ☐ matatu kana mana ☐ kudarika mashanu ☐ Hapana

18. Kubasa kwenyu munoita mabasa anoita kuti mufemere pamusoro zvqkanyanya kana kuti hana irove zvakanyanyisa sekutakura zvinorema, kuchera kenguva inodarika maminutes 10

☐ Hongu   ☐ Kwete

19. Maipedza nguva yenyu zhinji makagara or kuzvambarara here panguva yezvisungo zvelockdown?

☐ Hongu   ☐ Kwete

Section D Clinical history

8. Maiva nehurwere hwekuwanda kwemafuta mumuviri here kusati kwatanga zvisungo zve Covid 19

☐ Hongu   ☐ Kwete   ☐ Handizive

9. Kana iri hongu, chiremba wenyu ane mishonga yavakakunyorerai here yekudzikisa hurwere uhwu

☐ hongu   ☐ kwete

10. ? Mune hurwere hweku kwira kwe BP here?

☐ Hongu   ☐ Kwete   ☐ Handizive

11. Kana iri hongu, chiremba venyu vakakunyorerai mishonga yekudzikisa BP here

☐ hongu   ☐ kwete

12. Maiva nechirwere cheshuga here pasati patanga zvisungo zve Covid 19

☐ hongu   ☐ kwete   ☐ handizive

13. Kana iri hongu chiremba vakanyorerai mishonga yekudzikisa shuga here

☐ Hongu   ☐ Kwete

14. Kubva kutanga kwakaita zvisungo zve Covid 19 makabobatwa nechirwere cheshuga, kana chekuwanda mafuta mumiviri, kana chekukwira BP kana che moyo

☐ hongu ☐ kwete

APPENDIX 1 4: Shona symptom questionnaire for the detection of depression and anxiety

	Munguva yekuvharirwa mudzimba **During the lockdown**	Ehe Yes	Aiwa No
1	Pane pamaimboona muchinyanya kufungisisa kana kufunga zvakawanda here? Did you sometimes think deeply or think about many things?		
2	Pane pamaimbotadza kuisa pfungwa dzenyu panwechete here? Did you find yourself sometimes failing to concentrate?		
3	Maimboshatirwa kanakuita hasha zvenhando here? Did you lose your temper or get annoyed over trivial matters?		
4	Maimborota hope dzinotyisa kana dzisina kunaka here? Did you have nightmares or bad dreams?		
5	Maimboona kana kunzwa zvinhu zvangazvisinga onekwe kana kunzwikwa nevamwe? Did you sometimes see or hear things others could not see or hear?		
6	Mudumbu menyu maimborwa dza here? Was your stomach aching?		
7	Maimbovhundutswa nezvinhu zvisina mature here? Were you frightened by trivial things?		
8	Maimbota dza kurara kana kushaya hope here? Did you sometimes fail to sleep or did you lose sleep?		
9	Pane pamaimbonzwa muchiomerwa neupenyu zvekuti makambochema kana kuti makambonzwa kuda kuchema here? Were there times when you felt life was so tough you cried or wanted to cry?		
10	Maimbonzwa kuneta here? Did you feel run down (tired)?		
11	Pane pamaimboita pfungwa dzekuda kuzviuraya here? Did you sometimes feel like committing suicide?		
12	Mainzwa kusafara here mune zvamaiita zuva nezuva? Were you generally unhappy with the things you were doing each day?		

13	Basa renyu raive rave kusarira muma shure here?		
	Was your work lagging behind?		
14	Mainzwa zvichikuomerai here kuti muzive kuti moita zvipi?		
	Did you feel you had problems deciding what to do?		
	Scoring: Add together the number of questions to which the client responded "yes"		

APPENDIX 1 5: Informed consent for participants [English Version]

NAME OF RESEARCHER: FAITH MUGUGU A. (MPH student at Africa University)

PHONE: 0772 676 771

I am conducting a study on the NUTRITIONAL AND LIFESTYLE HABITS AMONGST ADULTS IN URBAN HARARE, ZIMBABWEANS DURING THE COVID-19 LOCKDOWNS. The findings from this study will be base for officials to design interventions targeting high risk groups and aiming to improve healthy lifestyle factors among residents during the pandemic, not for any other purposes. Please review this consent form carefully. Ask any question before making any decision.

PROCEDURE INVOLVED IN THIS STUDY

If you decide to be a participant in this study, you will be given a questionnaire with questions which assist in the assessment of nutritional and lifestyle habits during the COVID-19 lockdown in Harare. Each participant is expected to answer questions on the questionnaire in about 20 to 25 minutes. No harm will be inflicted during the process.

STUDY WITHDRAWAL

You may choose not to enter the study at any time without loss of what is entitled to you.

CONFIDENTIALITY OF RECORDS

If you volunteer to participate in this study, all the information you will provide will be kept in private and destroyed after the study. Names and national identification numbers will not be required in this study to maintain privacy.

PROBLEMS/QUESTIONS

Please you may feel free to ask questions about this consent, or any aspect of the study that is unclear to you now. However, you may take time to think over it. If you have any questions or problems in future, please feel free to contact me on 0772 676 771.

AUTHORISATION

I have read this paper about the study or it was read to me. I understand the possible risks and benefits of this study. I know being in this study is voluntary. I choose to be in this study. I know I can stop being in the study and I will not lose any benefits entitled to me. I will get a copy of this consent form. (Initial all previous pages of the consent form).

Interviewee's signature_____   ____   Interviewer Signature_____

Date_____

Name of Health Facility_____