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(A United Methodist-Related Institution)

BARRIERS TO ADHERENCE TO COVID-19 PREVENTION MEASURES IN HARARE IN 2021

BY

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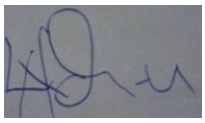
Abstract

Harare, the epicentre of COVID-19 infection in Zimbabwe has witnessed unprecedented morbidity and mortality due to the disease. However, although the government adopted the WHO endorsed prevention measures, the number of cases continues to rise and yet there still is no proven cure for COVID -19 to date only prevention measures are used to curb the pandemic. Non-adherence can be pervasive and detrimental. An analytical cross-sectional study was conducted, with mixed methods study design, in Harare in 2021 to evaluate adherence to practice of prevention measures and the barriers to adherence. A survey and interviews of key informants were used to collect data from three hundred and eighty-five (385) participants from households' selected using multistage cluster sampling procedure and twelve (12) key informants selected through convenience sampling. The key informant's interview data facilitated for an in-depth analysis of community adherence and the barriers encountered. Data on knowledge, attitude (perceived severity, perceived susceptibility and efficacy belief), adherence (regular practice) with preventive measures and barriers was gathered. Logistic regression, descriptive statistics and Chi-square were used to identify variables associated with the community's adherence with COVID-19 preventive measures and the barriers to adherence. There was an 89.5% response rate and the mean age of the study participants was 36 years; SD=12.0 and 217 (56.4%) participants were females. All the participants were aware of COVID-19 disease although 211(54.8%) of them did not know all the set prevention measures. The knowledge level was found out to be average ($M = 5.5$; $SD = 1.2$) 61.1% and the socio-demographic factors which influenced knowledge, were, gender, place of residence, level of education and health status at $p<0.050$. Neutral attitude with a mean score on attitude questions was (35.6; SD= 4.8; range 0-45). Efficacy belief (M=39.2; SD 7.3) showed the neutral attitude towards how prevention measures were beneficial and effective. The study found that knowledge was associated with attitudes, perceived susceptibility and efficacy belief, (OR=3.5; 95% CI :(2.9-6.5); p=0.012 and (OR=3.0; 95% CI: (2.7-6.1); p=0.014 respectively at $p<0.050$. The study showed an overall poor level of adherences of (39.7%) to the set prevention measures, 153 participants always practiced the set prevention measures. Regression analysis showed that the independent variables knowledge (OR=2.6; 95% CI: 1.9-4.6) and attitudes (OR=4.6; 95% CI: 2.9-6.9; p=0.001) were positive predictors of adherence to preventive measures at $p<0.050$. Adherence varied with socio-demographic factors, such as age, religion, place of residence and health status, comorbidity at $p<0.050$. The study concluded that knowledge, attitudes, religion and culture, lack of protective clothing, overcrowded spaces, lack of information and low-income levels were barriers to adherence to COVID -19 prevention measures. Recommendations were made to Harare City health to forge multisectoral collaboration with local clinics and private health institutions to enhance public awareness, training and adherence and to the Ministry of Finance to work with the Ministry of Health and Child Care (MoHCC) in subsidizing facial masks and hand sanitizers to cater for the under-privileged.

Key words – Prevention measures; adherence; barriers; knowledge; attitudes.

Declaration Page

I declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has never been submitted and will not be submitted to any other university for the award of a degree.



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Dedication Page

This dissertation is dedicated to my husband, Walter for his enduring patience and who has been a pillar of strength and a constant source of encouragement and support during the challenges of post graduate school, thus far the Lord has brought us.

List of Acronyms and Abbreviations

CDC	-	Centers for Disease Control and Prevention
BCOP	-	Blooms Cut off Point
EAM	-	Enumeration Area Map
HBM	-	Health Belief Model
KAP	-	Knowledge, Attitudes and practice
MeSH	-	Medical Subject headings
MoHCC	-	Ministry of Health and Child Care
OR	-	Odds Ratio
PPE	-	Personal Protective Equipment
UHC	-	Universal Health Coverage
WHO	-	World Health Organization
ZimStat	-	Zimbabwe National Statistics Agency

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CHAPTER 1 INTRODUCTION

1.1 Introduction

The world has witnessed severe unprecedented mortality and morbidity due to the novel Corona virus, COVID-19 (WHO, 2021). The disease has resulted in serious public health emergencies globally. As of 11 April 2021, there had been 134,957,021 confirmed cases of COVID-19, including 2,918,752 deaths, reported to WHO worldwide (World meter, 2021). Zimbabwe reported 247383 cases as of 11 march 2022, and of those 247383 cases, 40% of the cases were from its epicenter Harare, however the number of cases continue to rise although the ministry of health has implemented prevention measures for the public (MoHCC, 2021).

Responding to the pandemic has become a burden to many health systems, as there is no cure for the virus and only prevention measures are being used to control the pandemic. Since its inception there has been limited epidemiological data for the disease, and this has been complicated by the replicability of the virus and emerging of various variants of COVID-19 (Li et al., 2020). Subsequently, the lack of curative treatments clinically proven, and the scarceness of clinical interventions has heightened concerns, and it has become more than ever important for the public to engage in strictly compliance with the set prevention measures.

Prevention measures have been implemented globally by governments in order to control the spread of the disease, but there has been varying adherence within countries hence different level of efficacy of the prevention measures (Zhong et al, 2020). The WHO and CDC endorsed preventative measures include, movement restrictions,

lockdowns, social distancing, regular hand sanitization, vaccinations, quarantining and the wearing face masks, are the most effective methods so as to reducing the spread of the virus (Pradhan et al.,2020). The development of COVID -19 vaccine has brought hope to nations although there are challenges with adverse events and hesitancy.

It has become more imperative for nations and their health systems to ensure that the public adheres to the set prevention measures, and there is now need to understand what people know, how they view prevention measures, how they behave and the barriers they encounter in practicing prevention measures (Zhong et al., 2020). The public s knowledge, attitude and adherence towards preventive and precautionary strategies to COVID-19 is essential to containment of the pandemic. Consequently, the study assessed the barriers to adherence to COVID 19 prevention measures and assessed knowledge, attitude and adherence of Harare residents towards the pandemic.

1.2 Background to the study

COVID threatened sub-Saharan Africa which has low-medium income countries with poor health care systems (WHO, 2020). Countries imposed stern restrictions to curb and control the pandemic and health system preparedness. However, these control measures come with challenges for many sub-Saharan African countries where there was weakened infrastructure, under resourced health systems and weak public health surveillance system and COVID-19 testing thus compromising the preventative measures potential efficacy (Kholi, 2020). Zimbabwe, is faced with periodic strikes by healthcare workers in protest against under-resourcing of the health system and low salaries further limited the capacity to respond.

Morbidity and mortality rates in low-income countries is influenced by overcrowding and large household sizes, which could increase chances of easy transmission, the high prevalence of comorbidities, which makes progression to severe disease more common (Kholi, 2020). Zimbabwe had 36,934 confirmed coronavirus (COVID-19) cases and 1,525 deaths as of April 6, 2021 (MoHCC, 2021). The first case was announced on 15 February 2020 from then on cases began to rise on a daily basis. The government of Zimbabwe in response to COVID infections, had a nationwide lockdown on the 1st of March, 2020 (MoHCC, 2021).

The World Health Organization (WHO, 2020) declared that the coronavirus disease, COVD-19, was a state of emergency international concern it therefore urged countries to take rapid and aggressive actions against the spread of the disease (Lee et al, 2020). The pandemic in Zimbabwe has had an unprecedented crisis in recent history, the fragile health system, the double burden of diseases weak economy and a population with high comorbidities. Therefore, responding to the pandemic has been, challenging to Zimbabwe, with its fragile health system and it's in ability to produce its own vaccine, it become increasingly indispensable for the public to adhere to precautionary and preventative behaviours. In the midst of the pandemic, educating, engaging, and mobilizing the public to become active participants may help achieve.

Public involvement in taking precautionary measures and complying with the stipulated preventative measures which are: practicing hand hygiene, wearing masks, social distancing, and vaccination and quarantining the WHO validates the possible to control the spread of the disease (WHO, 2020). According to a recent study by Lee et al, (2021) individual behaviours may dramatically decrease morbidity and mortality

rates of COVID-19. Therefore, for Preventative health interventions to be effective, behaviour of the public need to be encouraged to take precautionary measures, evidence on social, cognitive, and psychological factors associated with the behaviours is necessary.

Previous studies (Bedru et al, 2021; Banik et al 2021) on infectious disease epidemics showed that knowledge and awareness, risk perception and efficacy belief help motivate people to adopt preventive behaviours. Correspondingly, research down by Asmelash et al, (2020) on COVID-19, revealed that knowledge, perceived controllability of the disease, optimistic beliefs, emotion, and risk perception may all account for precautionary actions of the public.

1.2 Problem Statement

Harare the capital city of Zimbabwe has had high mortality and morbidity and it is the epicenter of COVID-19 in Zimbabwe (MoHCC, 2021). According to the Ministry of Health as of 7 April, 2021 Harare had 13003 cases out of 36984 total cases for the whole of Zimbabwe. Of the 650 total cases in the country as of 7 April 2021 Harare has 419 (64%) and hence accounted for 40% of the country's total mortality due to COVID 19.

Despite the government efforts in implementing and enforcing preventative measures as national guidelines, the number of cases has been on the rise and the public has been failing to comply with the stipulated regulations. Failure to comply is more rampant at funerals, more common in high density residential places and those who are self-employed, among others. Therefore, the government efforts to control the spread of

covid-19 though preventative measures, have been rendered not very useful. Reluctance from the public in Harare, to comply with the preventative measures is a problem. This reluctance is evidenced by how people act as if its business as usual, how they try to avoid the preventative measures. The police and the army during lock downs in Harare have had to enforce compliance to COVID-19 preventative measures to the public.

1.3 Research Aim and objectives

1.3.1 Aim

To assess barriers to adherence to COVID-19 prevention measures, in Harare in 2021.

1.3.2 Objectives

i. To determine knowledge and attitudes towards COVID-19 prevention measures in Harare in 2021.
ii. To identify the sociodemographic factors that influence adherence to preventative measures in Harare in 2021.
iii. To analyze the level of adherence and practice of COVID -19 prevention measures in Harare in 2021
iv. To evaluate the barriers to adherence to preventative measures towards COVID -19 in Harare in 2021

1.4 Research Questions

i. To what extent are the people in Harare knowledgeable about on COVID-19 prevention and how is their knowledge reflected in their attitude?

ii. How does the socio-demographic factors influence knowledge, attitudes and adherence towards COVID-19 preventative measures in Harare in 2021?

iii. What is the level of adherence to prevention measures in Harare in 2021?

iv. What are the barriers to adherence to COVID-19 prevention measures in Harare in 2021?

1.4 Assumptions/Hypotheses

Knowledge, attitudes and regular practice of COVID -19prevention measures are prevalent among Harare residents. There is no association between the dependent variable (adherence to prevention measures) and the independent variables (knowledge and attitudes). Adherence to practice of preventative measures do not differ by sociodemographic variables (age, gender, place of residence, level of education comorbidities, religion and employment status

1.5 Significance of the study

Confronted with the COVID-19 pandemic and the lack of a cure it is imperative that researches be mobilized to find out what people know, their behavioral reactions to the disease, their adherence and the barriers to adherence of COVID 19 prevention measures (Zhai *et al*., 2020).

The study revealed low adherence level (39.7%) to the WHO set preventative in Harare in 2021, however preventative measures are known to be cost effective measures to control the pandemic, consequently the study findings revealed the need to strengthen and improve public adherence to prevention measures. Highlights from the study calls

for interventions to improve the practices, interventions to suit local context based on the sociodemographic characteristics identified.

The study found out that there was average level of knowledge (61.1%) and neutral attitudes although these were predictors to adherence to prevention measures. Thus, the results call for health promotion and education to improve adherence. Prevention is key to protecting the public and fighting the pandemic, therefore the study revealed gaps that will help strengthen adherence to prevention measures in Harare. The study is significant in policy formulation as it also identified challenges, hindering public compliance to prevention measures

1.6 Delimitation of the study

The study does not cover other towns or rural areas in Zimbabwe but is only limited to Harare residents above 18 years. There is need to explore other towns or rural areas. The study excluded other cities due to the limited resources, time and lack of financial support to conduct the research.

1.7 Limitation of the Study

Due to the cross-sectional nature of the study, a snap shot of events are captured, thus it may be difficult to ascertain the cause effect relationship between variables overtime. The study was conducted at the end of the Delta variant wave, thus some of the documented findings may have changed due to changes in the environment, policy, and pandemic. Social desirability bias (socially acceptable response) is a limitation in this study where participants respond to suggested preventative measure to suit socially acceptable response regardless of their actual poor practice or knowledge.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.1 Introduction

The COVID-19 pandemic is rapidly spreading around the globe and it has led to economic crisis, and health care crisis in many countries and regions across the world (Zhai et al., 2020). Coronavirus disease of the respiratory tract has brought in high mortality, premature death and high morbidity, in many countries. The disease has been most catastrophic in Asia, America and Europe with countries like Spain and Italy having high fatality rates. However, containment and cure of the disease has been the greatest challenge of mankind since the Swine flu pandemic in 1822. Preventative measures have been taken around the world and have been cost effective.

This chapter reviews literature on knowledge, attitude and adherence towards COVID-19 and its prevention. The purpose of this chapter is to get a deeper understanding of how knowledge and attitudes influences prevention of COVID-19. Therefore, research gaps will be identified and thus facilitating the research.2.2 Theoretical Framework

High morbidity and mortality rates due to coronavirus disease 2019 (COVID-19) has caused unprecedented turmoil upon the public and most health systems around the world have been heavily burdened (Hanson et al., 2021). However, globally the disease has been successfully prevented by adherence to preventative measures. Consequently, close monitoring of adherence and barriers is crucial and effective in planning and implementing suitable interventions to encourage the community toward adherence to preventive measures. Therefore, the present study aimed to assess the barriers to

adherence of preventive measures of COVID-19 according to the Health Belief Model (HBM).

Health Belief Model (HBM) was developed in 1950 by Hochbaum, Rosenstock to clarify the failure by the public to uptake and be actively involved in planned programs to prevent diseases. The HBM model was used to study the public's behavioral actions to health-related situations. Figure 2.1 below illustrates the health belief mode and its variables.

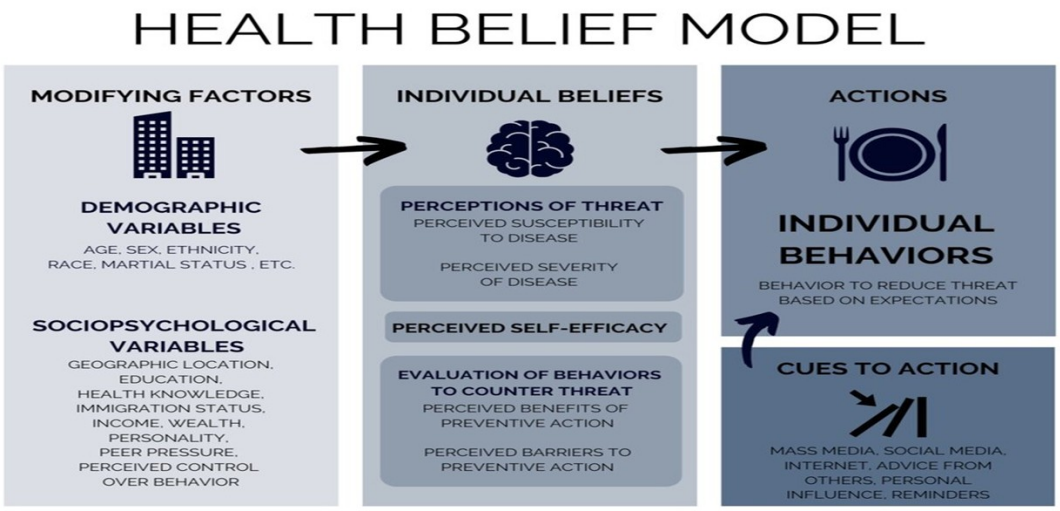

Figure 2.1. The theoretical framework Health Belief Model (HBM), (Lee et al., 2020)

The information generated through HBM models, can be used to develop strategies with a focus on improving the behavioral and attitudinal changes driven by the level of knowledge and perceptions toward preventive practices. In a recent study conducted in China, by Zhong and colleagues, (2020) they postulated that outbreak management, calls for urgent necessary understanding of the level of public's awareness of COVID-

19 and requires peoples' compliance and regular adherence to control strategies. These behavioral measures are largely influenced by their knowledge, attitudes, and practices.

2.3 Relevance of the theoretical framework

The health belief model is mostly used to demonstrate knowledge, attitudes and behavior with a view of the societal context in public health research. The information generated can be used to develop strategies focused on improving the behavioral and attitudinal changes driven by the level of knowledge and perceptions toward preventive practices. Thus, the framework was vital in the assessment of what people know, view and practice based on their societal context

2.4 COVID-19 preventative measures in Zimbabwe

The Government of Zimbabwe has been implementing and enforcing adherence to preventative measures as national guidelines to prevent the spread of COVID-19 (MoHCC, 2020). The government declared its first lockdown on 30 March, 2020 when nine positive cases had been confirmed. The prevention measures implemented were as per WHO guidelines which were, wearing of face masks, restricted movements, hand sanitization, avoiding gatherings, lockdown and closure of boarders. The Ministry of health in collaboration with the police and army have been encouraging and ensuring adherence to the set preventative measures however, this has met some resistance to some extent from urban dwellers. Resistance or failure to comply with the stipulated regulations is more rampant at funerals, more common in high density residential places and those self-employed, among others.

The spiral rise of COVID-19 cases has seen, the nation's taking all measures meant to control the spreading of the viral disease by encouraging and enforcing the citizens to be alert and adhere to stipulated measures (MoHCC, 2021). Dzobo and colleagues (2020) in sub-Saharan Africa established that African dweller were not complying with recommended health and safety measures advised by the health ministers of the countries or WHO, including social distancing and other important preventive measures. When the disease first emerged in China it was postulated that blacks are more resilient to the virus, whilst other Africans regarded the disease as a "distant white man's sickness" that could never spread in Africa, due to the high temperatures in Africa (Olum et al., 2020).

The World Health Organization (WHO) declared a pandemic on March 11, 2020, after the virus had affected 114 countries by that time, COVID-19 is still a threat to the health systems of the whole world and regions. The Chinese, government, authorities and citizens were able to quickly and effectively contain the spread of COVID-19 (Zhai *et al*., 2020). They took preventative measures which included several lockdown policies and strict preventive measures across the country and this has become a model of COVID-19 pandemic containment for many countries.

Consequently, many countries, have adopted different preventive measures including, movement restrictions, staying at home, closure of the schools and different social services, keeping social distance, appropriate hand washing and many more restrictions (WHO, 2020). Good knowledge, attitude, and precautionary measures (KAP) towards COVID-19 plays an essential role to management of the disease.

2.5 Awareness, perception and practice of COVID-19 and it's preventative measures

Globally, governments have made efforts to inform and warn the public about the highly contagious disease and to limit the spreading of the viral disease (Zhong et al., 2020). In Zimbabwe, the Ministry of health, informed the public through all mass media platforms for example through the radio, television, bill boards, text messages and daily reports were issued on the Ministry of health and child care website (MoHCC, 2020).

A study in South Korea by Lee et al., (2020), established that effective communication between the authorities and the public, to educate, inform, and empower communities with correct information about COVID-19, resulted in containment of the spread of the disease. However, many schools of thought have emerged concerning the origins of the disease and its prevention measures, this has raised different and mixed perceptions (Udoakang et al., 2021). Use of social media and various platforms has influenced speculations on social media, causing transmission of unverified information. Studies conducted in the US and the UK postulated the importance of a knowledgeable population to the prevention of the disease transmission, spread, and symptoms of COVID-19 (Hu *et al., 2020*).

Risk perception, according to the health belief model is how one views the prevention measures and their belief of effectiveness of the prevention measures, help motivate people to adopt or reject preventive behaviors The public assertions towards the disease and the preventative measures, determines the containment of the pandemic (Dassin, 2020). It is therefore the responsibility of the health authorities to impart knowledge which will determine the attitude of the public and consequently prevention of the disease. Health systems can be key to the implementation of social and behavior change

communication interventions to control the disease. Public behavior is important in the fight against the pandemic influenced by people's knowledge of preventing this infectious disease.

Recent study in China, Yulan Lin and colleagues (2021) ascertained that the knowledge, attitudes, and anxiety levels of the general population in relation to the COVID-19 outbreak, as well as its impact on them. However, the knowledge- and attitude-related items in their study were limited to the symptoms and modes of transmission of COVID-19 and did not explore the knowledge and attitudes on prevention measures.

Therefore, a gap was left in the body of literature with the above-mentioned limitation, this study will be designed and conducted to evaluate the knowledge and attitude of as well as attitude toward COVID-19 of different populations groups in Zimbabwe, Harare during the critical period of the outbreak. Thus, data gathered will be crucial for policy formulation in health education and promotion for the effective management of the disease. Knowledge and positive perceptions to COVID-19 prevention strategies is crucial for controlling the disease.

Prevention of the spread of COVID-19, non-clinical interventions based on Alma Ata Declaration on primary health care practice have been suggested by the World Health Organization (WHO), (WHO, 2020). These primary interventions have been proposed by WHO, as the cheapest, easiest, and the most effective ways to curb the spread of the virus but these are largely dependent on people's KAP. Therefore, implementation and enforcement of these primary interventions is important to reduce the spread of the disease (WHO, 2020).

2.6 Adherence and practices by the public towards COVID-19

Preventative practices by the public are influenced by a number of factors which determine the precautionary behavior. COVID-19 prevention behavior varies among different groups of people, most especially in those underprivileged ethnic groups (Lee et al., 2020). Inequalities in preventative practices, may be a barrier to effective adherence among population groups and is an urgent need to research to facilitate appropriate interventions

The pandemic has affected the livelihood of people, impacting the majority of human activities including the economy and health systems. Currently, although vaccines have been developed and administered there is no effective cure for COVID-19. Preventative measures, such as increased testing, contact tracing, quarantine of contact, and isolation of suspected cases and non-pharmacological interventions like social distancing, staying in home, working from home, self-monitoring, public awareness, self-quarantine is likely to hamper the actual epidemic growth (Hallewell, 2020).

Therefore, prevention practices promote better recovery from this fatal disease and holds the spread of the virus. Governments in different countries have implemented prevention practices such as social distancing, hand washing, travel restrictions, and use of alcohol hand rub and face masks. However, in Zimbabwe these preventive and control measures are not effectively being practised by the public throughout the country (MoHCC, 2020). Prevention practices and control of COVID-19 is attained through improving the knowledge and attitude of the public. Therefore, this study is aimed to assess the knowledge, attitude, and practice that enlighten efforts to fight COVID-19.

2.6.1 Associated factors to regular practice of prevention measures

The associations among knowledge, attitude and adherence to preventative measures provides valuable insights into how public health initiatives can better protect the populations in health emergencies, such as COVID-19. The relationship between knowledge attitudes and practices revolves around knowledge, as such knowledge influences attitude and practices. For example, behavioral prevention practices like wearing a facial mask, practicing hand hygiene, and avoiding crowded places is influenced by the level of knowledge one has about how to prevent the spread of the disease. However, in a study in China perceived risk and attitude of a person negatively facilitated the relationship between knowledge and practices (Zhong et al., 2020).

Surveys are usually used to find associations in order to develop and implement cost-effective public health interventions (Dassin, 2020). People living with less knowledge, negative attitudes and noncompliant practices to COVI-19 prevention showed considerably more significant morbidity and mortality rates of COVID-19 (Lai et al., 2020).

Behavioral factors related to COVID-19 are also unevenly distributed among people (Kohli, 2020). Even perception of risk is varied by the level of social support. A study in China showed that gender is a variable that, affect ones' attitudes and practices. Therefore, these variations in behavioral factors and knowledge requires an integration so as to synthesis prevention strategies that are effective.

There is limited evidence concerning the associations between knowledge, attitudes and adherence to preventative measures during the COVID-19 pandemic in Zimbabwe. The

present study seeks to investigate the associations between these variables and the barriers to adoption of the prevention measures.

Knowledge, attitude and practices in the prevention of COVID-19 is determined by a number of determinants which among others are: age, income, level of education, gender, socioeconomic, place of residency, sociocultural etc. (Kohli, 2020).

The African continent has been affected by the pandemic as all other continents and a total of 3.3 million cases and 82,601 deaths were recorded as of January 21, 2021 (WHO, 2020). Morbidity and mortality in Africa can be attributed to poor health systems, weak economies, and poor health financing and weak governance. However, Africa's COVID-19 statistics have been relatively low number of cases have been reported compared to other continents around the world. This be a result of the low testing capacity and poor reporting habits (WHO, 2020).

2.7 Challenges to effective practice of preventative measures

The challenges which hinder the implementation of preventative measures to prevent COVID-19 are varied and dependent on a country s status, policies economy and sociocultural values. The challenges that are faced in developing countries like Zimbabwe are as follows:

2.7.1. Lack of commitment from the public

Prevention measures uptake and commitment from public refers to the passion in the acceptance of WHO guidelines to prevent the transmission of COVID-19. A knowledgeable community on the novel coronavirus and awareness of WHO

regulations boost the safety commitment. Lack of commitment from public or public resilience would result in increase in transmission rates (WHO, 2019)

2.7.2 Political will and commitment to COVID-19 prevention strategies

The prevention strategies intensely depend on political support and enforcement, which is necessary for the participation, enforcement, maintenance, motivation in implementing the COVID-19 prevention process. The commitment from local authorities through facilitations of preventative measures, lock downs, ensuring the basic provisions to be provided to people to restrict their movement (Dassin, 2020) Lock downs are essential in preventing the transmission rate of COVID-19 pandemic and governments ought to impose restrictions and preventative measures.

2.7.3 Financial resources to implement preventative measures

Financial resources are crucial for the successful implementation of preventative measures, for example having personal protective equipment like gowns, masks, sanitizers etc., all require financial support (Yazdani & Wells, 2019). Increase in the number of COVID-19 infected cases burden on hospitals and all critical care amenities, due to lack of resources or work force to cope with this situation (Wilder, 2020). This barrier includes resources like equipment, personnel, and financial dealings etc. which are considered to be critical barriers while implementing COVID-19 preventive measures.

2.7.4 Poor health systems to manage COVID-19 cases

The pandemic COVID-19, has increased the demand for medications, testing facilities, diagnostics, vaccinations, and reagents. Procurement, use and management of medical products has been a hustle for the past year. Shortage of medical facilities like personal protective equipment, medical resources (such as oxygen supply, ventilators), have intensified the rise of infections in the world (Kohli, 2020). Some health institutions had, employees, going on strike because they lacked protective clothes to attend to patients and were poorly remunerated.

2.7.5 Weak institutions

It is mandatory for governments to formulate effective policies for the prevention, treatment and control of harmful diseases (Guan et al., 2019). However, governments have to provide and share to the public information about COVID-19 is accurate, timely, and consistent with human rights principles. Also, government should frame policies that could be easily implemented to prevent COVID-19 disease.

2.8 Causes of noncompliance with preventative measures against COVID-19

In depth analysis of the characteristics of people who do not comply with COVID-19-related public health preventative measures is crucial for developing operative public health campaigns in the current and future pandemics (Guan et al., 2019). COVID-19 transmission and impact, can be effectively managed in the absence of curative medicine, using primary prevention strategies, as such, high adherence to public health measures is crucial.

According to a study by Kabamba et al., (2020) in DRC, lack of compliance to public health measures for COVID-19 can be predicted by level of education, unemployed status, place of residency, gender of head of households, knowledge about COVID-19,

not been satisfied with the measures taken by the Ministry of Health, not been regularly informed about the pandemic, and age.

Informed people are better receptors of any preventative measure and will be actively involved in the strategies (Lin et al., 2020). Effective public response to an emergency requires clear communication and awareness in the epidemic situation, there may not be sufficient time for discussion or feedback as immediate actions are required. In such settings, the communication for development is not as important as the risk communication and the community engagement.

2.7.1 Weak cooperate governance and economy to support COVID-19 preventative measures

Prevention and risk reduction measures such as social distancing and lockdown can be enforced in order to control the spread. However, the political commitment and will of the governments will determine compliance of the public. The public need to understand what is required and be persuaded of the need to comply with it. Risk perception, behavioural changes, and trust in government information sources must be managed in a pandemic (Ibuka et al., 2009). Some countries have defiled and didn't adopt the preventative measures of lockdown, for example Tanzania and Sweden, consequently the public of those countries will not comply with preventative measures. Countries or individuals with diminutive resources may not comply with lockdowns (Guan, 2019). In Zimbabwe unemployment rate is high and many people survive through selling or having small businesses. Therefore, for these people to stay at home

without any income may be very difficult. Thus, for these people they will simply not comply with lockdowns for them to go earn money and survive.

2.7.2 Public stigmatization of patients who would have tested positive to COVID-19

Stigma arises when people segregate a sick person with COVID-19. Stigma can force individuals not to disclose their illness which prevent patient from seeking immediate health care, (Khader, 2020). Stigmatization may gradually contribute to more severe health issues, continuous spreading of the disease and difficulty in managing infectious diseases during an outbreak.

2.7.3 Culture and society

Culture and societal values may hamper preventative measures to COVID -19. In Zimbabwe, funerals for example are events which one should not fail to attend and when you attend you need to be close and comfort each other also shaking hands. Although the government has restricted funeral to have 30 people, the practise is contrary to the law as the public respect their culture of burring the dead.

2.7.4 Place of residency

High density suburbs in Zimbabwe are overcrowded where you can find even 10 families residing on a 200sqm property, with one unhygienic toilet or without running water. In these suburbs proper wearing of masks is not adhered to even maintaining social distancing. However, in affluent suburbs, compliance to preventative measures is generally better than in high-density. Issues like social distancing may be difficult in high-density suburbs because they are generally already overcrowded.

2.7.5 Low perceived risk

An uninformed person not cognisant of the risk at hand and one who lacks knowledge about COVID-19 is prone to non-adherence to public health instructions. Governments have to update the public the risk at a hand, to achieve effective risk communication in the outbreak context. This is essential not only to instruct and motivate the community to adopt preventive measures, but also to build trust in public health authorities and prevent misconceptions.

2.7.6 Level of education

Level of education determines the knowledge one can have over the preventative measures. While in Hong Kong, higher educated people have been shown to be more likely to avoid public places during the SARS outbreak, In Australia, it was found that people with higher education were more likely to report expected compliance. On the whole, the instruction allows the adoption of protective and avoidant behaviours, while some results have remained inconclusive (Rubin et al., 2009).

2.8 Summary

This chapter presented several local, regional and global literature to support the suggestion that knowledge, attitude, and adherence towards COVID-19 prevention, is an issue of public health importance as it is the only strategy to curb the pandemic. In this chapter the researcher also explained the HBM model and how it reinforces the study objectives, a conceptual framework was used to explore and synthesis the literature review. Literature was presented to highlight the relevance of the theoretical framework to the study. Although several studies related to adherence of prevention measures towards COVID-19 have been conducted globally, there is paucity of such

study in Zimbabwe. Literature review has revealed research gaps, on knowledge, attitudes and practices of the public towards COVID-19. The research is justified as it fills in the gaps left in the body of literature and allows design of policies specific s to our context.

CHAPTER 3: METHODOLOGY

3.1 Introduction

A community-based cross-sectional survey was conducted in Harare to assess barriers to adherence of COVID -19 prevention measures. In this study, a questionnaire and an interview guide were used to collect data on the following four aspects: Sociodemographic information, knowledge, attitude towards COVID-19 preventative measures, and practice toward COVID-19. According to Saunders et al., (2009) surveys enable the collection of large amounts of data in an economical way and key informants allows an in-depth analysis. An interview guide was used for interviews with key informants.

3.2 The Research design

A community based cross-sectional design was conducted using mixed methods approach of quantitative dominant and qualitative methods. The quantitative method used an analytical cross-sectional method and a survey was used to collect data. Descriptive method was used gather qualitative data. An analytical cross-sectional survey was conducted in Harare, as Harare is the epi-center of COVID-19 and it also harbors the largest population in Zimbabwe. A community-based cross-sectional study was conducted to assess the level of knowledge, attitudes, practices and adherence towards prevention.

3.3 Population and Sampling

3.3.1 Study site

The study was conducted in Harare city. A sample of participants was picked from the 48 wards to ensure representation across Harare based on residency and income. Below is a map showing the study site.

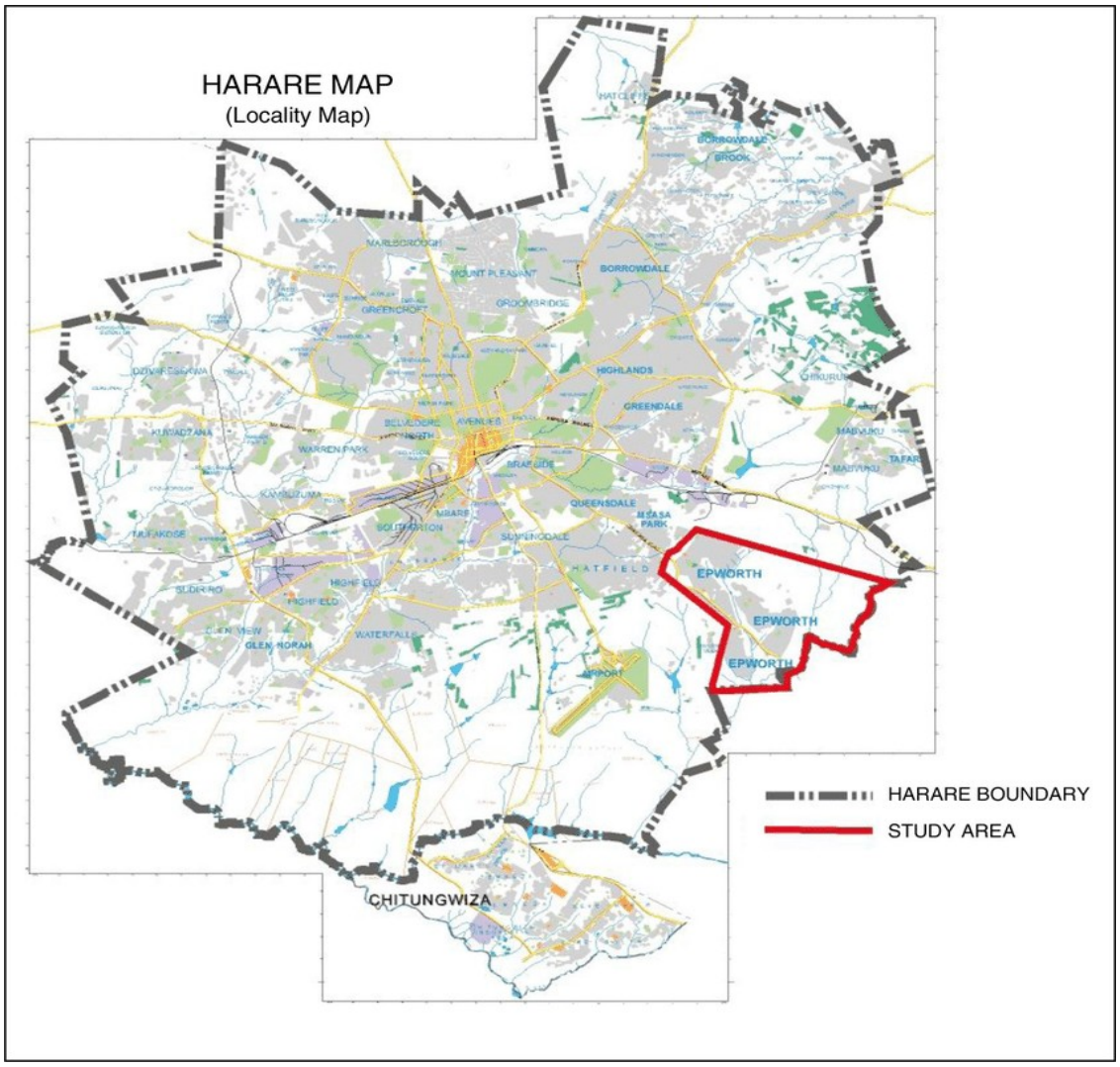

Figure 3.1 Map showing the study site, Harare. (Google maps, 2021)

3.3.2 Study population

The population of the study was Harare community residents, aged 18 years or more, who understood the contents of the consent form, who agreed to participate in the study and were able to complete the questionnaire. The population included: the working-class white collar and informal working class, students, and those unemployed. Residential location was considered in picking participants in order to have equal and representative distribution of participants.

3.3.3 Sampling methods, size and procedure

Harare has a total population of 1530 000 people above 18years; however, it was not possible to collect data from every individual in Harare, therefore a sample, representative of the population was` used in the study.

Sample Size

The sample size was calculated using the Dobson's formula which is,

$$n = N*X / (X + N - 1),$$

where,

$$X = Z_{\alpha/2}^2 * p*(1-p) / MOE^2,$$

Where n = minimum sample size, N was total population and MOE was the margin of error at 5%. The sample size was calculated at a sample proportion p=50%, Zα/2 was the critical value of the normal distribution and confidence level of 95%.

A sample of 385 participants was recruited for the survey and 12 key informants were interviewed using an interview guide.

A. Quantitative approach

Multi-stage cluster sampling method

The population, Harare residents above the age of 18years was put into clusters, which are the 48 different wards in Harare. Systematic sampling was used to select 6 wards, thus, from the list of all the 48 wards every 8th ward is selected. The sampling fraction was (sample size/study population 8/48).

Cluster sampling technique was used to select suburbs, with two clusters of high density and low density. Simple random sampling was used to select 2 suburbs per each ward from the two clusters. A total of 12 suburbs was used in the study. The suburbs were selected ensuring that there was equal representation in terms place of, as place of residence, as it was a demographic variable, also under study.

Systematic sampling technique was used to select 9 households in each suburb ZIMSTATS Enumerator Area Map (EAM). Four participants at most were selected per household in the different households in the 12 suburbs were enrolled for the study.

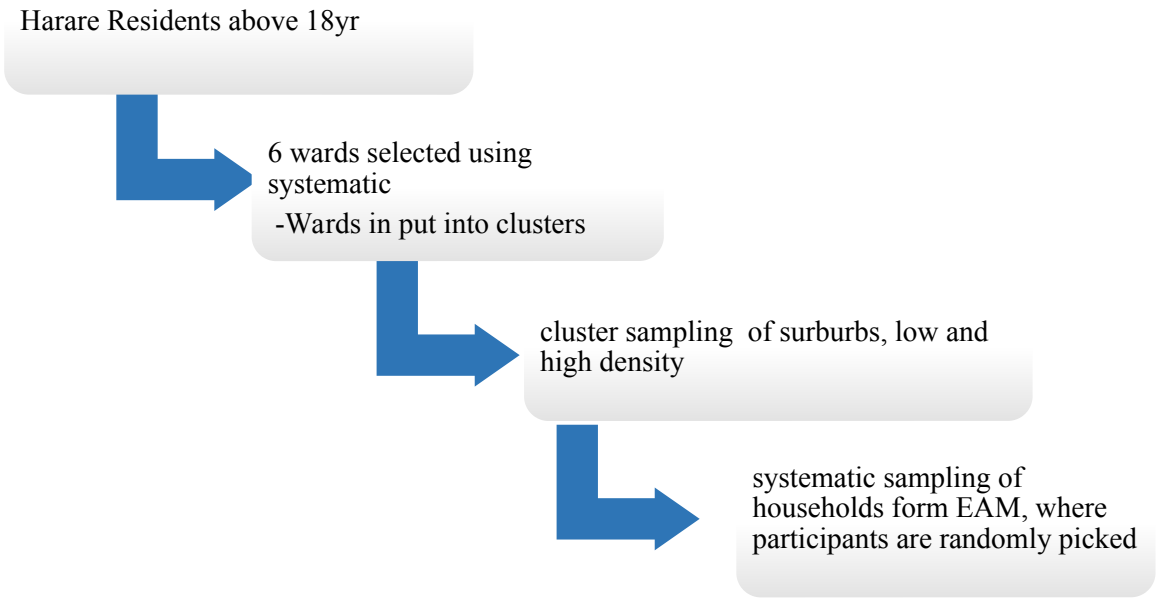

Figure 3.2 Multi-stage sampling method illustrated

B. Qualitative Approach

Convenience sampling method

Convenience sampling was used to select key informants from community health centers and household heads. 12 Key informants were selected using convenience sampling. Qualitative method was used to explore the lived experiences and challenges in practice of prevention measures. Thus, the qualitative method mainly aimed at addressing the "why" participants in the study adhered to or not to prevention measures.

3.4 Data Collection Instruments

A questionnaire and an interview guide were the data collection instruments which were used to collect data. Data was obtained through a survey a questionnaire and from interviews with an interview guide. The data collection tools for the assessment of the knowledge, attitudes, barriers and regular practices towards prevention measures were

based on the questions adapted from published literature and by the recommendations of WHO and Communicable Disease Control (CDC).

The questionnaire was divided into 4 portions: the first portion deals with socio-demographic characteristics; the remaining three portions contain questions on the assessment of participant's knowledge, attitudes and regular practices.

Reliability on the research instrument to consistently measure the same variables giving the same result was ensured by using the Cronbach's alpha score of 0.6 and above.

3.4.1 Variables

Knowledge, attitudes, adherence and barriers to adherence to COVID-19 prevention measures were the variables that were analysed and sociodemographic factors which influenced adherence were also evaluated.

Independent variables

The independent variables were, demographic characteristics (gender, age, profession, working environment, place of residence), knowledge and attitudes. Demographic variables included age, gender, marital status, religion, current employment status, suburb, and the source information of COVID-19 related knowledge.

Dependant variables

The dependent variable was level of adherence to COVID- 19 prevention measures. Adherence towards prevention measures was computed from the response section on regular practice of prevention measures endorsed by the government (wearing of face

mask, hand hygiene, social distancing, avoiding crowded areas, travel restriction, staying home and quarantining.)

3.5 Pilot Study

Pretesting of tools was used to check for reliability and validity of instruments. Consequently, the results of the pretest were used to improve the data collection tools. A pilot study was conducted done on 40 random participants in Harare the reliability of the questionnaire was assessed using Cronbach's alpha. Face validity was performed to evaluate the comprehension towards understanding of the questionnaire and to assess how important it was to target study participants. A revised version of the questionnaire was developed based on the feedbacks from face-validation. The data generated from the pilot study and incomplete responses were excluded from the final analysis

3.6 Data Collection Procedure

The study used a structured questionnaire for the survey and used interviews with key informants to collect data qualitative data. A survey was conducted in the different wards of Harare, participants above 18years of age were be allowed to participate. An introduction to the study was given to the participants on the purpose of the study and they were provided with an informed consent form providing full details of the study. The survey was conducted for one month, and the researcher has 2 research assistants which allowed the researcher to gather as much data as possible.

Key informants who were local community health heads, and household heads were interviewed with an interview guide. These key informants allowed for in-depth

analysis of barriers to practice of COVID -19 prevention measures and this facilitated data collection on practice levels of the community.

3.6.1 Inclusion and Exclusion criteria

Participants above 18years who were able to read to fill in the consent forms, questionnaire or participation recruitment form were included in the study. Participants residing in Harare and selected wards only were included.

The study excluded participants who are below 18years of age and those that were not able to read or write and who did not reside in Harare or selected ward.

3.7 Analysis and Organization of Data

The cleaned data was analyzed by using Statistical Package for Social Science (SPSS) version 21 software and NVivo for qualitative data. Numerical was summarized as means and standard deviations and categorical variables were summarized in frequency and percentage and the result was presented using tables. The bivariate and multivariate logistic regression model were used to identify factors associated with good knowledge, good attitude and good practice towards COVID-19.

The variables in the bi-variable analysis with $p < 0.250$ were entered in the multivariable logistic regression. Pearson correlation between knowledge, attitude and practice scores will also be assessed. $P < 0.05$ is considered statistically significant. Qualitative data from open-ended questionnaires was analyzed using content analysis, that is the researcher would go over each questionnaire and writes down important points.

3.8 Ethical Considerations

Ethical consideration was sought from Africa University Research committee. For the interviews with health workers at health facilities, interviewees would go through an Informed consent before the interview process, the same will be done on interviewing key informants. Anonymity of the respondents was ensured and guaranteed to the participants.

The informed consent disclosed the purpose of the study to the participants. There was no harm that was inflicted during the process of data collection and information collected was not be disclosed to anyone else. Interviewee names were be taken during the interviews but a numerical coding system was used to identify questionnaires.

3.9 Summary

A cross-sectional study was conducted using a survey and interviews with residents and key informants in Harare in 2021. The study collected data on barriers hindering adherence to practice of COVID-19 prevention measures in Harare suburbs in 2021. Permission to conduct the study was sought from Africa University Research Ethics Committee, participants were asked to participate voluntarily and permission for interviews was sought from the local clinic heads. A sample of 385 participants was selected for the survey using multistage sampling method and 12 key informants were enrolled for the interviews upon a verbal consent and the collected information was kept in confidence and used for academic purposes only.

CHAPTER 4 DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter, presents the results of the study, and how data was analysed. Section 4.1 presents the descriptive statistics on sociodemographic characteristics of the study participants. Analytical analysis of knowledge attitude and adherence to practice of prevention measures was conducted in section 4.7. Data analysis was conducted and the results were presented in form of tables and graphs. The study used percentages and frequencies, multivariate logistic regression analysis to draw conclusions and chi-square to measure association of dependent and independent variables

4.2 Data Presentation and Analysis

4.2.1 Socio-demographic Characteristics of Participants

The following section describes the main characteristics of the study participants and a summary of the data through descriptive analysis.

Out of the 430 potential participants, 385 study participants were included in this study, giving a response rate of 89.5%. Of all the questionnaires rolled out 45 of the questionnaires were not filled completely, some respondents didn't complete or in some cases only answered few questions leaving some. Consequently, fully completed questionnaires were used in the study.

Table 4.1 below shows the results of the study and the mean age of the study participants was 36 years with ±12.0 standard deviation. Majority of the participants 217 (56.4%) were females and about 152 (39.5%) of the study participants were aged between 29 and 39 years. Most of the participants 258 (67%) had a diploma and above

on educational achievements. Formal employment was widely held 246 (63.9%), followed by those self-employed 102 (26.5%) and 10(2.6%) of the participants where unemployed and 27 (7%) students. The majority (70.9%) of the participants had no chronic illnesses at the time of the study with 273 (29.1%) of the participants having chronic illness, and 331 (8.6%) of the participants had been tested positive for COVID - 19.

Most of the participants 277 (72.0%) were Christians, whereas those that followed traditional culture were 76 (19.7%) and 32 (8.3%) were Moslems. High density residential areas had more participants 201 (52.2%) than low and middle residential areas which accounted for 184 (47.8%) Table 4.1 below summaries the sociodemographic results of the study.

Table 4.1 Socio- demographic characteristics

Variable		Frequency Total N=385	Percent (%)
Age	18-28 years	81	21.0
	29-39 years	152	39.5
	40-50 years	122	31.7
	50+ years	30	7.8
Gender	Female	217	56.4
	Male	168	43.6
Level of education			
	Primary	8	2.1
	Secondary	119	30.9
	Diploma	93	24.2
	Undergraduate	124	32.2
	Post-graduate	41	10.6
Employment			
	Self employed	102	26.5
	Employed	246	63.9
	Student	27	7.0
	Unemployed	10	2.6
Health status			
	No Comorbidity	273	70.9
	Comorbidity	112	29.1
	COVID-19 positive test	33	8.6
	COVID -19 negative test	352	91.4
Religion		277	72.0
	Christian	76	19.7
	Traditional	32	8.3
	Moslems		
Place of Residence		51	13.3
	Low density	133	34.5
	Medium density	201	52.2
	High density		

Comorbidity - any existing chronic diseases

COVID -19 positive - previously tested for COVID -19 and tested positive

4.2.2 Awareness of COVID-19, its preventative measures and sources of information

All participants (100%) had heard about the COVID-19 pandemic. However, from table 4.2 below the majority of the participants (54.1%), they did not know the prevention measures. The primary sources of information about COVID-19 for the majority of study participants were through television and radio (53.0%), followed by social media (42.1%) and family (4.9%), these were found to be sources of information as shown in Figure 1 below.

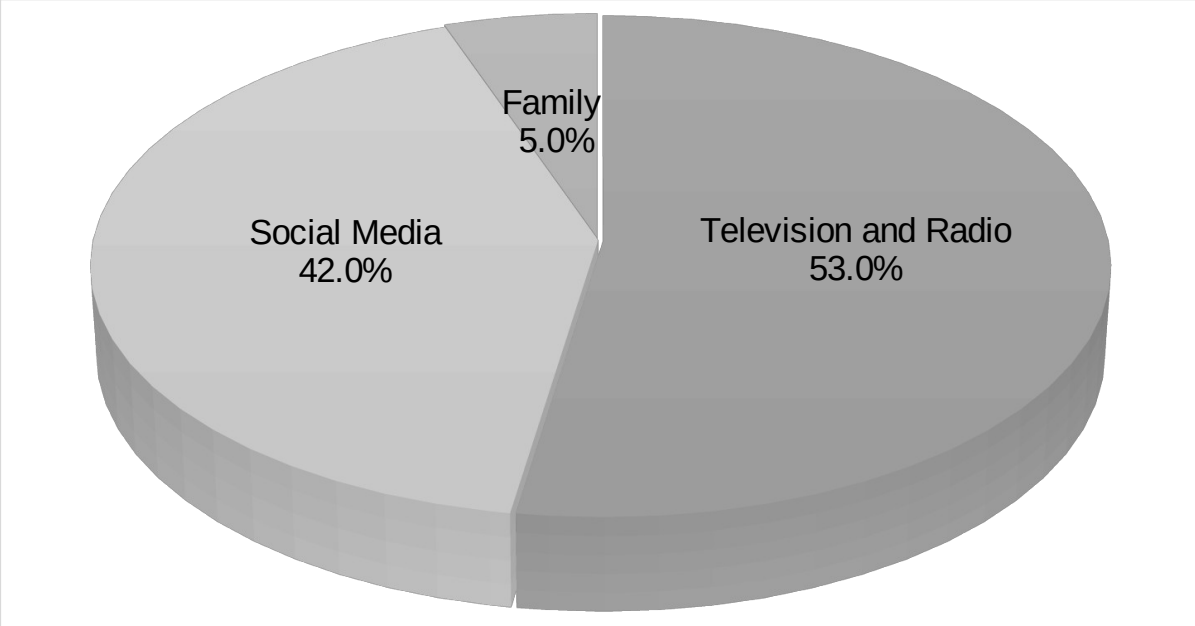

Figure 4.1 Sources of information on COVID -19 and its prevention used

4.2.3 Assessment of knowledge of COVID-19 and its preventative measures.

The level of knowledge towards COVID-19 prevention measures among the study participants was evaluated with nine (9) questions on transmission, prevention measures and symptoms. The scores were classified as either good, average or poor based on the

Blooms cut off point. The majority of the participants responded correctly to an average of 5.5 out of the 9 knowledge items ($M = 5.5$; 61.1%) ($SD = 1.1$). According to blooms cut off point the overall knowledge level was average (61.1%). Table 4.2 below shows the results from knowledge assessment.

Symptoms

The results of the study showed that the majority of the participants had good knowledge about the cause of the disease 336 (87.3%) and its symptoms 251 (65.2%) (fever, cough, sore throat, muscle pain and weakness, flu-like symptoms and difficulty in breathing. more of the participants, 251 (74.3%) were aware of those at high risk of getting infected and how COVID-19 could be transmitted 241(62.6%). However, on the contrary, 204(53%) of the participants did not know how long it takes for a person to show symptoms after being infected.

Prevention measures

Low knowledge level was reflected on knowledge of preventative measures, were the majority (54.1%) of the participants failed to know all the recommended preventative measures like social distance, travel restrictions, hand hygiene, wearing of face masks, avoiding crowded areas, quarantines and vaccines. Thus, (44.9%) of the participants correctly identified all the recommended prevention measures and (46%) of the participants identified less than half of all possible listed prevention measures and consequently (9.1%) of the participants were not sure of all of the government set preventative measures. However, 42.9% of the participants knew the recommended social distance length, whereas the majority either failed to answer correctly (32.7%) or they didn't know (24.4%) the recommended distance. Most of the participants (58.7%)

had good knowledge treatment of COVID -19, that there was no cure, note withstanding those who had poor knowledge (41.3%) about the curation of the disease.

Transmission

The majority of the participants 336 (87.3%) had good knowledge on the causative agent of COVID-19, despite the few who failed to know the COVID -19 disease's causative agent. Most of the study participants, 241 (62.6%) could state correctly the various transmission modes (through cough droplets, contact with infected secretions, close contact with infected respiratory secretions, these secretions expelled through sneezing, talking or coughing and that transmission can be airborne) Knowledge on COVID-19 transmission was found to be shallow 104 (27%), the results showed that the participates failed to know that COVID-19 can be transmitted through an asymptomatic person. Consequently, low level of knowledge 109 (28.3%) was also shown on how long it takes for an infected person to show symptoms. Table 4.2 below shows knowledge variable that were assessed.

Table 4.2 Responses on Knowledge Questions (%)

Knowledge variable	Correct	Incorrect	I don't know
1. Which of the following causes COVID-19?	336 (87.3%)	32 (8.3%)	17 (4.4%)
2. Does COVID-19 have a cure?	226 (58.7%)	59 (15.3%)	100 (26.1%)
3. Who is at the highest risk of getting COVID-19?	286 (74.3%)	68 (17.6%)	31 (8.1%)
4. COVID -19 is transmitted through? **(M)**	241 (62.6%)	103 (26.8%)	41 (10.6%)
5. How is the disease prevented? **(M)**	173 (44.9%)	177 (46.1%)	35 (9.1%)
6. Can a person with no symptoms transmit COVID-19?	104 (27.0%)	196 (50.9%)	85 (22.1%)
7. Which of the following is a symptom of COVID-19?	251 (65.2%)	46 (11.9%)	88 (22.9%)
8. How long does it take a person with COVID-19 to get symptoms?	109 (28.3%)	204 (53.0%)	72 (18.7%)
9. What is the recommended social distance?	165 (42.9%)	126(32.7%)	94(24.4%)

(M) – multi-response

4.2.4 Socio demographic determinants of knowledge on COVID-19 prevention measures

Regression analysis of the data showed that knowledge scores on COVID 19 prevention measures varied by the sociodemographic variables. The results in table 4.3 below shows that educational level attained, place of residence, health status and gender were the four factors that were significantly associated with poor knowledge scores at $P<0.05$.

Level of education (OR=3.13(2.05-5.58) is a positive and significant predictor of the probability of knowledge one has on COVID -19 prevention measures. Therefore, the results showed that the among study participants, the odds of good knowledge of

prevention measures for those who had attained higher level of education where 3 times the odds of those with lower levels of education to have good knowledge about prevention of COVID 19 (OR=3.13(2.05-5.58).

Being a male OR=1.61(1.14 - 4.59) according to the results, is a positive and significant predictor of knowledge of preventative measures. Thus, the results showed that the odds of a male participant to have good knowledge is 1.6 times the odds of a female participant to have good knowledge on preventative measures.

Place of residence is a positive and significant predictor OR=2.22(1.98-5.57) knowledge varied with place of residency, the odds of good knowledge of prevention measures for those who live in low density areas is 2.2 times more than the odds of good knowledge in those who live in high density areas. Health status is a significant positive predictor OR= 1.88 (1.48 - 3.94) the odds of good knowledge of prevention measures for those who had comorbidities was twice the odds of good knowledge in those who didn't have comorbidities.

Consequently, other socio demographic factors like age, and religion were not associated to the knowledge level of COVID-19 preventative measures. Table 4.3 below shows the regression results.

Table 4.3 Sociodemographic determinants of knowledge

				95.0% CI for OR	
VARIABLE	**B**	**p-value**	**OR**	**Lower**	**Upper**
Age	0.122	0.383	1.8	1.2	2.3
Gender	0.129	0.037*	1.6	1.1	4.6
Health status	0.124	0.012*	1.9	1.5	3.9
Level of education	0.068	0.026*	3.1	2.1	5.6
Place of residence	0.139	0.015*	2.2	1.9	5.7
Religion	0.164	0.082	3.1	1.5	3.7
Employment status	0.083	0.026*	2.1	1.8	3.5

Constant	3.931	<0.01	4.14	

*Significant
*B - Beta

4.3 Discussion and Interpretation

4.3.1 Attitude towards COVID-19 prevention measures

Attitudes were assessed based, on perceived susceptibility, perceived severity and efficacy belief. These measures were based on the health belief model, the Likert scale and Blooms cut off point which enabled attitudes assessment.

There was a general neutral attitude as the results presented a mean score on attitude questions was 35.60 (SD= 4.80, range 0-45). The majority of the participants, perceived the risk of becoming infected with COVID -19, as such a moderate score on perceived susceptibility (Score=5) (M=3.89, SD=0.87). However, participants also considered COVID-19 as a threat (perceived severity) in Zimbabwe showed by the high score (score=5) (M=4.74, SD= 0.79). The mean score on efficacy belief (M=39.24, SD 7.31) showed the neutral attitude towards how prevention measures were beneficial and effective. The elderly and those chronically ill were perceived to be at a greater risk than anyone else in the population (score=5) (M=4.86, SD= 0.98). However, many of the participants (71.9%) (277), had negative attitude towards quarantine centers they wouldn't want to get into quarantine centers when they tested positive.

Lock downs and restricted movements were perceived (Score=10) (M=7.91, SD=0.83) as necessary to the prevention of COVID -19, although some perceived lockdowns as redundant. The majority of the study participants (Score=10) (M=9.68, SD=0.94), perceived that the preventative measures taken by the Zimbabwean government to be

essential and helpful. However, the community had challenges (Score =10) (M=5.72, SD =1.75) in adhering to the preventative measures. Many of the participants hesitated to get vaccinated (67%) (258), they perceived that the vaccines not safe for them (Score=5) (M=4.26, SD=0.86).

Table 4.4 Responses of Attitudes towards COVID-19 preventative measures

Variable	Range	Mean	SD
Perceived Risk			
Perceived severity	0 – 5	4.7	0.8
Perceived susceptibility	0 – 5	3.8	0.7
Person at high risk	0 – 5	4.8	0.9
Efficacy belief			
Lock downs and restricted	0 – 10	7.9	0.8
Government efforts	0 – 10	9.7	0.9
Community attitude	0 – 10	5.7	1.8
Effectiveness of prevention	0 – 10	5.4	1.5
Quarantines are effective?	0 – 10	6.1	1.3
Would you get vaccinate?	0 – 10	4.3	1.1

4.3.2 Influence of knowledge on attitudes

Regression analysis was used to assess the influence of knowledge on attitude towards COVID-19. The study showed that knowledge is a positive and significant predictor of attitudes, thus the results show a significant influence on perceived susceptibility (Odds ratio (OR) = 3.5; 95% CI: 2.9-6.6; p=0.012), perceived severity (OR) = 2.8; 95% CI: 2.5-5.7; p=0.036) and efficacy belief, and (OR = 3.0; 95% CI: 2.7-6.1; 0.014) respectively at $p<0.050$. For every one unit increase on knowledge the odds for efficacy belief change by a factor of 3.0. This means that the odds of positive attitude to efficacy of the prevention measures in people with good knowledge is 3 times the odds of a positive attitude to efficacy of the prevention measures in people who lower levels of

knowledge. Therefore, knowledge is an important predictor of attitudes towards COVID 19 and it's towards prevention measures.

The odds of those participants with good knowledge to have higher levels of perceived susceptibility of COVID-19 was 3.5 times more the odds of higher perceived susceptibility in participants who had poor knowledge.

A statistically significant association between attitudes and some socio-demographic variables such as area of residence, religion, health status, employment status and level of education ($p < 0.050$) was observed. The results showed that one change in the independent variables (sociodemographic) can predict the probability of positive attitude when all other independent variables are held constant. Table 4.5 below gives the analysis result between various demographic factors and attitude variables (perceived susceptibility, perceived severity and efficacy belief of preventative measures).

Table 4.5 Determinants of attitude

	Perceived Susceptibility			Perceived Severity			Efficacy Belief of prevention measures		
Variable	**B**	**OR (95% CI)**	**p-value**	**B**	**OR (95% CI)**	**p-value**	**B**	**OR (95% CI)**	**p-value**
Age	0.10	1.5 (1.3-2.7)	0.062	0.09	1.8 (1.3-3.5)	0.018	0.04	2.1 (1.9-4.9)	0.012
Gender	0.14	2.4 (1.5-3.9)	0.013	0.12	1.9 (1.1-3.0)	0.032	0.09	2.1 (1.8-5.3)	0.041***
Health status	0.09	5.2 (3.2-8.3)	0.022	0.11	3.4 (2.7-6.2)	0.018	0.16	2.5 (1.9-5.6)	0.031***
Education	0.08	3.0 (2.2-4.6)	0.132	0.05	2.7 (1.9-3.6)	0.031	0.07	1.4 (1.1-2.2)	0.022
Religion	0.16	2.0 (1.5-3.5)	0.031	0.15	2.9 (1.5-4.5)	0.042	0.12	3.0 (1.7-5.1)	0.012***
Residence	0.17	2.9 (1.9-4.6)	0.017	0.03	2.0 (1.5-3.2)	0.024	0.09	2.2 (1.1-3.6)	0.033***
Employment	0.23	1.8 (1.3-3.3)	0.040	0.44	1.7 (1.2-2.1)	0.013	0.19	1.8 (1.2-4.3)	0.021***
Knowledge Score	0.19	3.5 (2.9-6.6)	0.012	0.12	2.8 (2.5-5.7)	0.036	0.21	3.0 (2.7-6.1)	0.014***
Constant	2.67		0.001	3.19		0.001	3.01		0.001

CI- Confidence Interval

*** Significant for perceived susceptibility, severity and efficacy belie

4.3.4 Adherence to COVID-19 prevention measures

Level of adherence was computed based on the level of regular and constant practice of the government set prevention measures, that is hand hygiene, avoiding crowded spaces, wearing face masks social distancing, staying home, restricted movements and lockdown and keeping physical distance in the last two weeks. The study showed an overall average score of adherences of (39.7%) to the set prevention measures, 153 participants always practiced the set prevention measures.

Wearing of face masks was frequently practiced (293) 76.1 %, with the majority of the participants always wearing their masks. Table 4.6 below shows that most of the participants (268) 69.6% indicated that they would stay home if they had flu like symptoms. Hand hygiene was not always practiced, with many of the participants washing hands or sanitizing sometimes and not always (208) 68.1%. Nevertheless, social distancing and avoiding crowded areas (especially at funerals) was poorly practiced as only (42) 10.9% had never been to crowded places.

Poor practice toward COVID-19 preventative measures in the study was shown by those who reported that they had attended crowded places in the last 14 days (343) 89.1 %. When coughing or sneezing 76.8% of the study participants indicated that they would use a handkerchief or tissue napkin rather than coughing or sneezing in the crease of their elbow, only 17.7% would use the crease of their elbow.

Adherence to the set preventative measures was found to be difficult as the majority of the participants rated that following preventative measures was difficult (174) 45.2% and 24.4% of the participants indicated that it was extremely difficult to follow the preventative measures.

Poor practice was in having close contacts when people are greeting each other giving hugs or handshakes. The majority of the participants indicated that they would sometimes use handshakes or hugs as a form of greeting and 40.5% of the participants indicated that they would always hug or give a hand shake.

Table 4.6 Practice of COVID-19 preventative measures

Practice	Frequency	Percentage
Wearing of face masks		
Always	293	76.1
Sometimes	92	23.9
Never	0	0
When I have flu-like symptoms, I stay in doors		
Yes	268	69.6
No	117	30.4
Practice on Coughing or sneezing		
Hands	21	5.5
Crease of elbow	68	17.7
Handkerchief / tissue	296	76.8
Handwashing or sanitizing		
Always	173	44.9
Sometimes	208	54.1
Never	4	1.0
Other home remedies used (*multi-response*)		
Herbs	288	74.8
Vitamin C and other drugs	189	49.1
Steaming	321	83.3
Attendance of public gathering		
Last 3 days	147	38.2
More than 2 weeks ago	196	50.9
Never	42	10.9
Social distancing in public		
Always	107	27.8
Sometimes	182	47.3
Never	96	24.9
How often do you shake hands or hug?		
Always	156	40.5
Sometimes	201	52.2
Never	28	7.3
How difficult is it to adhere to preventative measure?		
Scale 0-5 (1 = not difficult, 5=extremely difficult)		
0-2	117	30.4
3	174	45.2
4-5	94	24.4

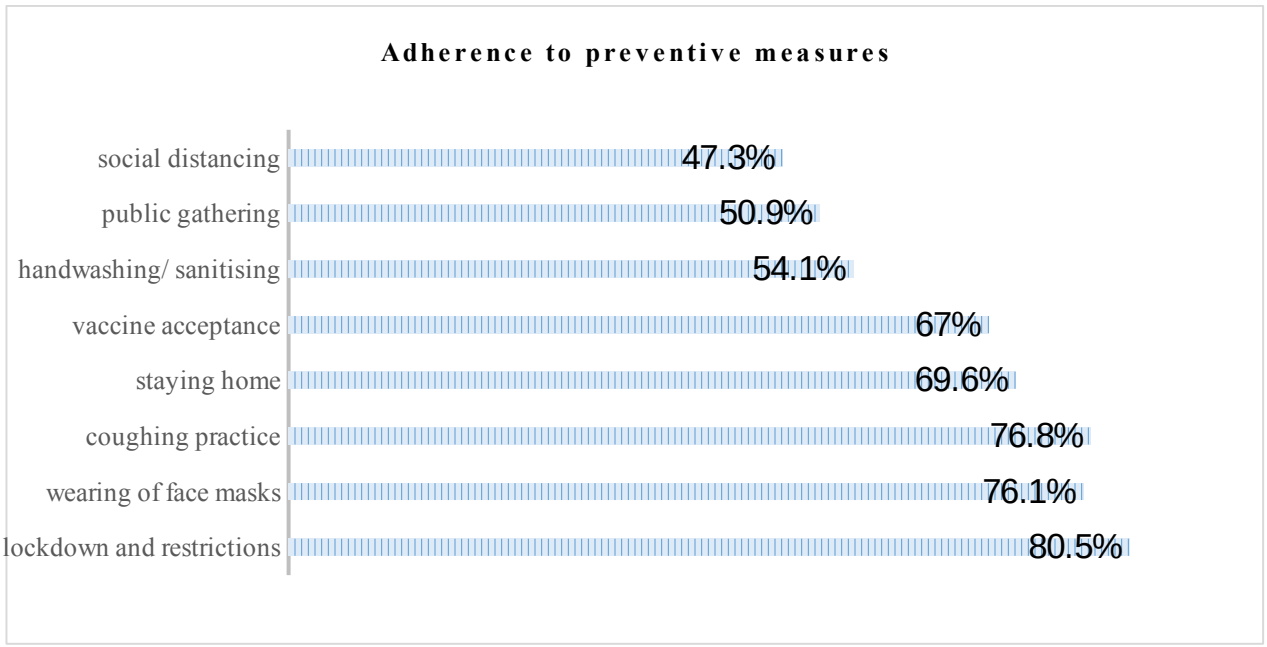

Figure 4.2 *Adherence with COVID-19 preventive measures among participants*

4.3.5 Factors associated with adherence to COVID-19 prevention measures

Regression analysis showed that knowledge, attitudes (perceived susceptibility and efficacy belief), health status, age, religion, place of residence and employment status were positive and statistically significant predictors of adherence to COVID 19 prevention measures. The results below showed significant associations at $p<0.050$ with a number of factors. The age of the participants was significantly associated with wearing of masks and avoiding crowded place OR=4.6; 95% CI: (2.9-9.6); p=0.036 those who are younger tend to not to wear masks and they fail to avoid overcrowded paces. Thus, the odds of adhering to masking up and avoidance of overcrowded areas in young people is 4.6 times more than the odds of adherence in older people.

"There is word going around in the community that COVID-19 does not infect young people more so in those that are less than 40years old, most of the young people do not wear masks at all or properly wear them, when you ask them why they do not wear their

face masks, their answer would be young people are not at risk of getting the virus it's the older people who are at risk, so let those people wear masks." (Interview 2, 6, 8, 11)

Interviews with key informants also revealed non adherence of young people and they indicated that there was lower perceived susceptibility. Thus, both the survey results and interviews validate that age is a predictor of adherence to practice of prevention measures.

Comorbidities showed a positive association with adherence to prevention measures, for adherence to avoiding overcrowded areas (OR= 3.5; 95% CI: 2.2-4.6; p=0.036). the odds of those with comorbidities adhering to avoiding overcrowded areas was 3.5 times more than the odds of adhering for those without comorbidities.

"I exercise every day to reduce my weight they say obese people are prone to the disease now." (Interview5)

"My doctor says diabetes and blood pressure are chronic conditions which can increase my risk of being hospitalized with COVID-19, so he said I should control my diabetes and BP." (Interview 7)

Most patients on antiretroviral drugs we urge them to adhere to their medication and to also adhere to prevention measures and the majority they do as we have taught that their immune system is weak and compromised any contact with an infected person entails their high susceptibility. (Interview 1)

Analysis of the interviews results shows that the health status of a person predicts the level of adherence, which is also driven by fear of being at risk and high perceived susceptibility. The key informants revealed that they have noted other behavioral

changes in people in the community, as they wish to prevent getting infected, some engaging in physical exercises, regular intake of medicinal prophylactics, supplements healthy eating, compliance with chronic disease treatments.

Place of residence showed that it was a positive predictor of adherence to wearing of masks (OR= 4.3; 95% CI: 2.9-9.0; p=0.028), hand hygiene (OR=2.0; 95% CI: 1.7-3.0) and avoiding crowded areas (OR=4.0; 95%CI: 2.2-6.8; p=0.026). Adherence to prevention measures was higher in low density areas than in high density areas. Therefore, the odds of avoiding crowded areas in those in low density areas is 4 times the odds of those in high density areas.

"If you go to the shopping center you will see vendors and their customers overcrowded and without properly wearing their masks." (Interview 9)

"We stay here as five families and look at how small the rooms are and how can we practice social distancing when all our houses are close to each other like this, if one of us has flue we all have that flue and we are used to it" (Interview 2)

The interviews revealed why adherence to practice is low in crowded living spaces or work spaces, thus validating that residential area is associated with adherence and is a predictor of adherence

Employment status was positive predictor of adherence to wearing of masks OR= 4.5; 95% CI: (3.1-5.9): p=0.019 and avoiding crowded areas OR= 5.0; 95% CI :(3.3-7.3); p=0.012. The odds of adherence to avoiding overcrowded areas in those formally employed is 5 times higher than the odds of those not formally employed.

Most residents of this suburb are self-employed and most rely on selling for their income. If you go to Mbare Musika you will understand that social distance is difficult

to adhere to even if you want to. We all want food on our tables so at the end of the day you do what is necessary to survive. (Interview 3, 8, 12)

Perceived susceptibility, severity and efficacy belief (attitudes), were positive predictors of adherence to prevention measures. However, efficacy belief proved to be a more positive and higher predictor of adherence at OR= 4.6; 95% CI: (2.9-6.9); p=0.01. Therefore, odds of those that had positive attitudes to adhere to prevention measures was 4.6 times more than the odd of those with negative attitudes. Consequently, this shows that attitudes can predict adherence and negative attitude as such is a barrier to adherence of COVID 19 prevention measures.

Knowledge positively influenced adherence to wearing of masks OR=2.5; 95% CI: (1.8-4.0); p=0.012 and avoiding crowded areas OR=2.6; 95% CI: (1.9-4.6); p=0.038 Therefore, the odds of adhering to wearing of masks for those who had good knowledge about prevention measures was 2.5 times more than the odd of adhering in those that didn't have good knowledge. Knowledge has shown that it is a positive predictor of wearing of masks, hand hygiene and avoiding crowded areas, therefore low knowledge levels are a barrier to adherence.

	Always Wearing Face Mask			Always practicing Hand hygiene			Always Avoiding crowded Areas		
Variable	**B**	OR (95% CI)	**p-value**	**B**	OR (95% CI)	**P-value**	**B**	OR (95% CI)	**p-value**
Constant	2.87		0.001	2.01		0.001	1.78		0.001
Age	0.11	4.6 (2.9-9.6)	0.036	0.08	1.6 (1.2-2.9)	0.069	0.09	1.7 (1.3-2.7)	0.016*
Comorbidities	0.05	2.6 (1.9-3.8)	0.013	0.09	1.6 (1.3-2.1)	0.052	0.13	3.5 (2.2 -4.6)	0.019*
Place of reside	0.06	4.3 (2.9-9.0)	0.028	0.05	2.0 (1.8-3.0)	0.037	0.08	4.0 (2.3-6.8)	0.026*
Employment	0.17	4.5 (3.1-5.9)	0.019	0.11	1.9 (1.6-3.8)	0.054	0.21	5.0 (3.3-7.3)	0.012*
Religion	0.02	1.8 (1.5-2.0)	0.012	0.06	1.5 (1.2-2.7)	0.170	0.04	1.9 (1.5-3.8)	0.041*
Knowledge	0.09	2.5 (1.8-4.0)	0.012	0.07	1.9 (1.4-2.7)	0.130	0.05	2.6 (1.9-4.6)	0.038*
Perceived susceptibility	0.04	1.7 (1.2-2.1)	0.042	0.06	2.73(1.9-4.3)	0.032	0.07	2.1 (1.7-2.7)	0.027*
Perceived severity	0.02	2.9 (1.7-4.0)	0.035	0.07	1.95 (1.5-2.9)	0.027	0.06	2.6 (1.9-4.2)	0.031*
Efficacy belief	0.35	3.8 (2.7-4.1)	0.001	0.29	2.6 (2.1-4.5)	0.032	0.36	4.6 (2.9-6.9)	0.001*

Table 4.7 Factors associated with adherence to preventative measures

*Significant independent variables CI – Confidence interval
Adherence (always wearing face masks: hand hygiene: avoiding crowded spaces)
Comorbidities – any chronic illness the participant has.

Chi square test in table 4.8 below highlights the association between adherence and the factors that predict adherence to preventative measures. The null hypothesis at 0.05 significance level, states that there is no association between the dependent variable (adherence to preventative measure) and the independent variables (attitude and knowledge). Therefore, results of the Chi test suggests that there is sufficient evidence to reject the null hypothesis to conclude that there is an association between adherence to preventative measures and attitudes towards COVID -19 prevention. Perceived susceptibility (Fisher's exact (F) = 2.2; df =1 p =0.026, Perceived severity (F= 4.5; df =1; p =0.042) and Efficacy belief (F=3.9; df =1; p =0.01) at alpha level of 0 .05

Table 4.8 Test for independence between the adherence to preventative measures and independent variables knowledge and attitude

Chi-Square Tests

Factors that determine adherence to preventative measures	Fisher's Exact	Df	Sig.(2-sided)
Knowledge			
Transmission	2.581	1	0.138
Symptoms	5.658	1	0.224
Prevention	3.707	1	0.022*
Attitude			
Perceived susceptibility	2.156	1	0.026*
Perceive severity	4.502	1	0.042*
Efficacy belief	3.965	1	0.012*

*Significant

4.3.6 Other practices used to prevent COVID-19 infection

NVivo was used to analyze data qualitative data from interviews of key informants, and themes were identified after reading the interview scripts and analyzing which themes are emerging in all scripts that are similar.

The interviews with key informants highlighted other practices which were used to prevent COVID 19, some participants believed praying and fasting, steaming with herbs, using ayurvedic herbs such as ginger, garlic, lemon, onions etc. and using traditional medicines.

"Vitamin C is said to be good in boosting your immune system and I take it every day. Steaming with hot water or with eucalyptus or vicks helps in opening airways and deactivating the virus. (Interview 3, 4)

Some of the key informants' highlighted influence of religion on the pandemic and on practice of prevention measures as they indicated also how determines the attitudes of the participants.

"I believe there is nothing impossible with God read Psalm 91 it talks about these deadly diseases".

"Our Apostle said the vaccine is the mark of the beast and said that this disease was made by the devil to destroy nations, those that get vaccinated will get the mark"

"Only God can serve us this disease cannot be controlled, it's a sign of the end of times" (Interviewer 1, 3, 5, 6, 9)

The results showed that there are several other methods being used to prevent the public from getting the diseases.

"I do use tsunami and zumbani herbs they normally help me when I have that severe flue."

A word cloud below depicts the other practices which are being used by the public to protect themselves from the pandemic

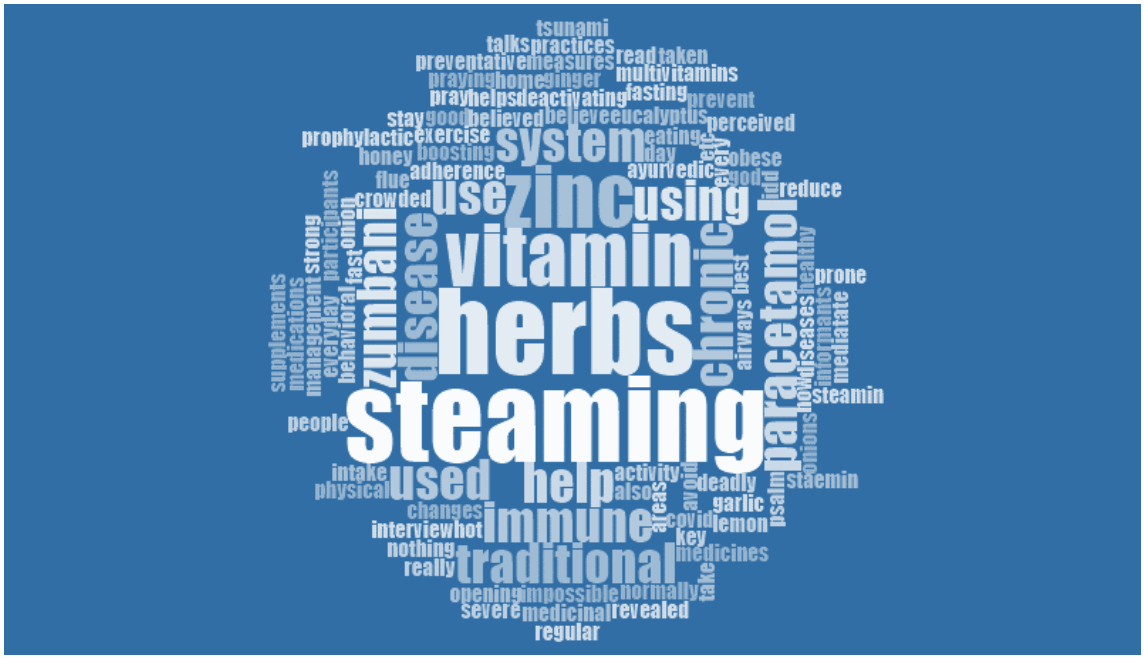

Figure 4.3 Word cloud showing other practices used to prevent getting infected (Key informants, 2021)

4.3.7 Barriers to adherence to COVID-19 preventative measures

Quantitative data from the survey and qualitative data from interviews was used to find out the barriers that hinders the adherence to preventive practices for COVID-19 by the communities. Most of the participants 71% of respondents indicated that they faced difficulties in practicing the recommended COVID-19 preventive behaviors. Figure 4.2 presents the nature of these challenges.

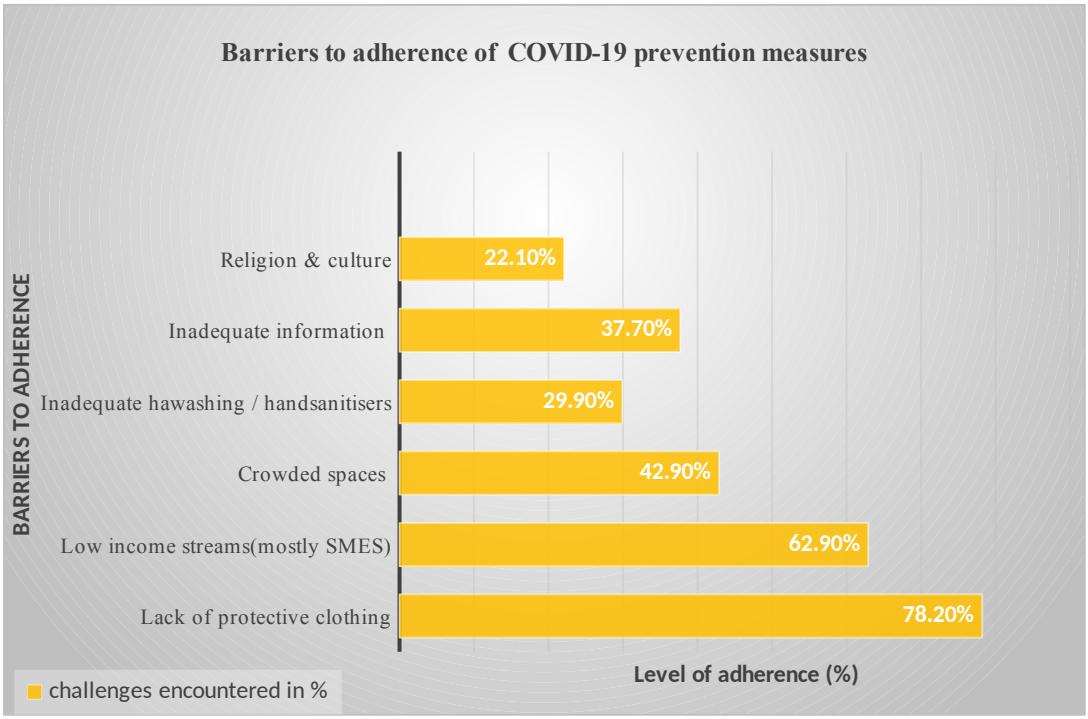

Figure 4.4 Barriers to adherence of COVID-19 prevention measures

Lack of protective clothing (78.2%) was the major barrier to the uptake of preventative measures against COVID-19. They indicated that there was a general shortage of face masks, hand sanitizers, lack of PPE in hospitals.

As you know most of populations are in low income, when we talk of prevention measures most of them do not have the face masks, soap, water or sanitizers even most hospitals do not have all the protective clothing." (Interview 1)

However more participants (62.9%), further alluded their failure to low-income streams which may force participants to defile lockdown and go out to earn a living.

"*We have many people in this community who are self-employed, I also sell vegetables if I stay home even one day, I won't be able to feed my children and pay rent. Even when there are restricted movements, I still find my way to continue selling because I need money and no one can take care of my family if I don't." (Interview 7)*

Overcrowded spaces (42.9%) at home and at work were high lightened as some of the challenges face. Another challenge was that of lack of hygienic products like hand sanitizers

The advent of the novel coronavirus, COVID-19 caught the world unaware, where information is much needed. In this study 37.7% of the participants indicated that the challenge they faced regarding prevention of the disease was lack of accurate information on how to prevent the disease.

There are reports on social media that this disease doesn't affect the black people because of their black skin and we also have heard that the most countries affected the most are outside of Africa. I believe this disease will not have that much impact on people in our community as it has in China. (Interview 6)

Religion and culture (22.1%) have been raised as another challenge that influences the practice of the set preventative measures. Qualitative data shows that religion is also hindering vaccines uptake as people perceive risk to their faith. The result also indicate that some people believe that there is nothing they can do to protect themselves but just to continue believing in their faith which will shield them from getting the disease. Religion has seen some apostolic churches gathering in their numbers despite the lockdown measures. Culture has also been raised as barrier to adoption of prevention measures, gatherings at funerals reduces compliance to prevention measures as people mourn, they remove masks, hug each other, stay close and give handshakes as it is by the Zimbabwean culture.

"We are black people and we bury our loved ones with dignity, I will never miss a funeral of my relative and we are all expected anyway to attend funerals to pay our last

respects." It is *Our culture and social events brings us together like funerals*, *celebration parties and other ceremonies how so these social events are hindering adherence to preventive measures*. *If you do not participate on funeral services of neighbors*, you *will be marginalized in the community. (Interview 7, 11*

"Our Apostle said the vaccine is the mark of the beast and said that this disease was made by the devil to destroy nations, those that get vaccinated will get the mark, only God can serve us this disease cannot be controlled, it's a sign of the end of times" (Interviewer 1, 5, 6, 9)

"All we need is to pray, the bible tells us that in the last days there will be pestilent diseases which destroy the world. So now it's the time for people to gather and worship God, we need to be praying and not to seat home and wait to perish" (Interview 5)

Summary

The analysis of the results showed that all the participants we aware of the pandemic, although not all the preventative measures were known. According to Blooms cut off point scale the 61.1% mean knowledge is considered moderate. The mean attitude score showed neutral attitudes towards preventative measures, however the results showed overall poor adherence to prevention measures of 39.7%. Practices, where regular and adhered to in wearing of face masks and hand sanitization but there was poor practice in avoiding overcrowded spaces. Regression analysis showed that the independent variables knowledge and attitudes were positive predictors of adherence to preventive measures Multivariate regression analysis indicated a statistically significant influence of sociodemographic factors, such as age, religion, place of residence and health status

on adherence at $p<0.050$. Thematic analysis of qualitative interview data showed other practices which were used to prevent COVID-19, prayer, steaming, herbs, medicinal prophylaxis and healthy lifestyles among others. The Chi square test showed there is sufficient evidence to reject the null hypothesis to conclude that there is an association between adherence to preventative measures and attitudes towards COVID -19 prevention. Lack of protective clothing, low incomes, crowded spaces, lack of relevant information, religion and culture, were identified as barriers to adherence of the prevention measures.

CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The widespread spread of COVID-19 calls for an assessment of the determinants of adherence, as preventative measures have been endorsed by WHO and CDC as cost effective control measures to end the pandemic (Mohammed et al., 2020). Consequently, the study assessed knowledge, attitudes and barriers to adherence prevention measures using an analytical cross-sectional method. The first section of this chapter, 5.1 gives a discussion of the research findings based on the research objectives and literature. The following sections will give conclusions drawn from the study, recommendations, limitations and areas of further research will be suggested.

5.2 Discussion

5.2.1 Awareness of COVID-19, prevention measures and sources of information

The current study results showed high awareness rate (100%) from study participants regarding COVID-19 pandemic, however the majority of them were not fully aware (54.9%) of all the measures used to prevent the disease. This was consistent with the study findings by Grebestadik and colleagues (2021), the awareness rate was high in Ethiopia as the pandemic was widely spreading and affecting many countries. Despite the high awareness of the new viral disease, many people were not fully aware of all the preventative measures.

The major sources of information (53%) for this study were television and radio, followed by social media and internet 42.1%. This indicates that the government's effort to conscientize and maximize awareness of the deadly disease, through television and radio giving daily updates on the disease. Use of social media as a source of

information was also high, although this was contrary to a study in China by Zhong and colleagues in (2020) which showed that the internet and social media contributed to 83.3% of public awareness. This may be due to the fact that Zimbabwe is a developing country and its internet infrastructure is also not on the reach of many.

5.2.2 Public's knowledge, attitude and adherence towards COVID-19 prevention measures

Knowledge

The study showed that about six in every ten (61.1%) adults had satisfactory knowledge about COVID-19, and its preventative measures. The knowledge score according to Blooms cut off point was moderate. The knowledge score was slightly lower than the average for West African countries though they are within the same category of the Blooms Cut off range. Based on the research by Udoakang and colleagues (2022) the knowledge average score, for West African countries was, 67.82 ± 8.31 (Ghana, Liberia, Senegal and Nigeria). In comparison with knowledge score among Chinese (90%) (Zhong et al., 2020) and US residents (80%) (Clements, 2020) this study's score seems to be lower, though it comparable with other developing countries in Africa. According to Lee et al., (2021), knowledge plays a crucial role in the effective adherence of the preventive measures in curbing the COVID-19 pandemic. Therefore, the low knowledge score, in this study maybe partly attributed to low exposure to public health education and promotion or advertising regarding COVID-19 since the outbreak began. On the other hand, social media and the internet has also contributed to the awareness of the disease. Although the social media is associate with fake news,

misinformation and conspiracy theories around COVID-19, social media has been an influential source of information attributing to knowledge.

Attitude

Attitudes towards COVID-19 was assessed to capture perceived susceptibility, severity including their fear of contracting the disease and their response to prevention measures. Participants perceived COVID-19 as a threat in Zimbabwe showed by the high score (score=5) (M=4.74, SD= 0.79). The mean score on efficacy belief (M=39.24, SD 7.31) showed the neutral attitude towards how prevention measures were beneficial and effective.

The majority of respondents feared for themselves, the thought of them or any of their relations contracting the disease. As such this fear would drive them to have a positive attitude towards wearing masks, sanitizing their hands and avoiding overcrowded spaces. This was consistent with Lee et al., (2021) they determined that how people view or perceive health threats determines their behavioral actions. However, there was generally negative attitude in willingness to accept COVID-19 vaccine. This attitude towards vaccines was pointed out by Udoakang et al., (2022) as they alluded the hesitancy to lack of information and knowledge on the need for a vaccine both individually and for the population.

Consequently, regression analysis showed that knowledge has influence on attitude towards COVID-19 preventative measures. Those participants with low knowledge were more likely to have lower levels of perceived susceptibility of COVID-19 whereas participants with higher knowledge showed higher efficacy belief towards COVID-19 preventative measures. This result corresponded to the results found by Lee et al.,

(2021), the study results showed that knowledge has a crucial role in enhancing good attitude towards preventive measures.

Adherence to prevention measures

The study found that adherence to COVID -19 prevention measures was low, (39.7%), contrary to the study by Lee et al., (2020) in China they had an adherence level of (89.9%). This could have been due to the fact that China was the epicenter for COVID-19 globally and witnessed high mortality as such people learnt to adhere.

The World Health Organization (WHO, 2020) has made recommended guidelines and safety practices to prevent and alleviate COVID-19 transmission and progression, which is handwashing, avoiding crowded space, vaccinations, social distancing and wearing face masks. Results from the study showed that, the majority of the respondents seemed to be knowledgeable with them, as was evident in their perception of following safety practices like regularly wearing of masks although social distancing and avoiding overcrowded spaces proved to be a challenge.

Poor practice toward COVID-19 preventative measures in the study was shown by those who reported that they had attended crowded places in the last 14 days especially attendance to funerals. According to Udoakang et al., (2022) social factors and culture in West Africa were proven to be influential to the practice of preventative measures consequently attending funerals in Zimbabwe culture is a must for everyone as they pay their last respects regardless of COVID-19 prevention measures. Again, it is a social taboo to quarantine a sick relative, as such quarantine centers, are less socially acceptable.

The qualitative interviews with key informants highlighted other practices which were used to prevent COVID 19, some participants believed praying and fasting, steaming with herbs, using ayurvedic herbs such as ginger, garlic, lemon, onions etc. and using traditional medicines.

The key informants revealed that other behavioral changes were being used, such as regular physical activity, intake of medicinal prophylactic supplements, healthy eating, adherence to chronic medications were also perceived as preventative measures taken. Contrary to scientific evidence highlighted by Brewster et al., (2020), the study findings practices are not scientifically proven as prevention measures. This shows that the public lacks knowledge on the effective prevention measures. Brewster et al., (2020) argues that Steam inhalation is traditionally used as a home remedy for common colds and upper respiratory tract infections. The evidence base of the practice is weak, with unproven theories that the steam loosens mucus, opens nasal passages, and reduces mucosal inflammation, or that the heat inhibits replication of viruses

Adherence to the set preventative measures was found to be difficult as the majority of the participants rated that following preventative measures was difficult. Zimbabwe as developing country, its economy may not be as financially stable thus shortages of asks soap and hand sanitizers. Governments have set guidelines, lockdowns and travel restrictions to control behavioral practices and curb the diseases. Nevertheless, the economy has more of self-employed citizens who rely on having their businesses running every day without lock downs, consequently lockdowns are met with resistance.

5.2.3 Sociodemographic factors that influence adherence

Results of the study showed that knowledge scores on COVID 19 prevention measures varied by the sociodemographic variables such as educational level attained, place of residence, health status and gender.

The variations by sociodemographic factors were consistent with researches by Aravindhan et al., 2021: Azlan et al.,2020, this study showed that those who had attained lower level of education showed poor knowledge as they would not comprehend how the disease is transmitted or prevented (Dassin, 2020). Males showed better knowledge that women, this could be due to the fact that some women are full time house wives and would not get much time to be knowledgeable about world events. Place of residence was associated with knowledge, thus knowledge varied with different residential areas, were in low density areas participates seemed better knowledgeable than high density. The knowledge gap was highlighted by Kholi and colleagues, (2020) city residents were better knowledgeable than rural areas residents due to lack of technology.

Participants who had chronic illness were better knowledgeable that those that are well as they perceived greater susceptibility due to their different health conditions. This result was consistent with the research findings by Aravindhan and colleagues (2021), they found out that people with chronic conditions were more aware of the risk factors of COVID -19, as they would always seek health advice from professionals. Consequently, other socio demographic factors like age, and employment were not associated to the knowledge level of COVID-19 preventative measures.

Udoakang et al., (2022) concluded that varied COVID-19 mortality and morbidity rates have been reported globally, and may be attributed to the varied knowledge, attitude and perception of the disease. A statistically significant association between attitude and some socio-demographic variables such as area of residence, age, health status and level of education was observed. Zhang et al., (2020) indicated that health education and promotion to prevent and control the pandemic must take into consideration sociodemographic factors based on scientific evidence to heighten public knowledge.

Young adults, perceived lower risk and would not correctly follow preventative measures than the age group 40years and above. Place of residence affects the attitude and one views preventative measures if the social background, is where families stay in overcrowded rooms or houses it become very difficult to view efficacy of social distancing and avoiding overcrowded spaces. Conversely those with compromised health status would perceive being more susceptible and fear the consequences of contracting the disease. Thus, their attitude to preventative measures will be determined by their need to protect their health status (Kholi, 2020)

Regardless of a general optimistic attitude towards COVID-19, the study found areas of poor practices, such as social distancing and avoiding overcrowded spaces. There was notable poor practice determined by age, place of residence, gender, education and health status. The result is similar with findings of other studies (Zhang et al. 2020; Udoakang et al. 2022) except for a study in Thailand which established that socio-economic classes, gender and places of residence do not have an influence on practice. To this end the research results calls for the need to optimize the COVID-19

knowledge, attitudes and practices of residents through education programs explicitly engaging certain sociodemographic factors in the prevention of COVID-19

5.2.4 Correlations between knowledge, attitude and adherence

Zhong et al., (2020) postulates that associations among knowledge and practice avail valuable insights into how public health interventions that can better protect the public's health during public health emergencies, such as emerging pandemics like COVID -19. The study showed that knowledge can play a crucial role in enhancing the attitude and practice of preventative measures.

Practice of preventive measures also varied with attitudes of the participants thus, participants who perceived high risk due to COVID-19 infection were more likely to wear a facial mask. Consequently, perceived high susceptibility to the disease and perceived high infection risk was associated with practicing hand hygiene and avoiding overcrowded spaces. Therefore, participants who had higher efficacy beliefs, avoided crowded places to prevent COVId-19 spread. To this end attitude (efficacy beliefs and perceptions) have a significant effect on practices of COVID-19 preventative measures. Previous studies identified similar associations when performing KAP surveys toward COVID (Amzat et al., (2020): Durizzo et al., (2021)), thus validating the study results.

Lee et al., (2020) postulates that good preventative practices require promoting both knowledge and efficacy beliefs among the public. Thus, the study findings were consistent with previous studies which claimed that attitude is a predictor of preventive behaviors (Udoakang, (2022); Durizzo, (2021): Amzat et al., (2020)) as the public need

to believe by having information that preventative measures that they are adopting would be effective.

However, the results from the study revealed that knowledge attitudes and practices are also determined by other sociodemographic factors. Therefore, health interventions should be shaped taking into consideration the socio demographic factors as they influence the KAP factors.

5.2.5 Barriers to adherence of preventative measures

Lack of adequate protective kits such as face masks, gloves, hand sanitizer (78.2%), and low-income streams (62.9%) and crowded living conditions, even crowded workspaces (42.9%) were the most topical barriers to COVID-19 preventive practice in the study. Deprivation of the relevant information on COVID-19 was indicated as a factor which hampered effective practices and adoption of preventative practices. Consequently, respondents with a low level of education, and those deprived of accurate information were more likely to have difficulty practicing the preventative measures. However, regardless of the fact that nearly all of the participants had received some form of COVID-19 awareness campaign, 37.7% indicated lack of information regarding COVID-19 prevention.

Udoakang et al., (2022) found out from their study lack of knowledge about COVID-19 was a major drawback to the uptake of preventative measures. The research postulated that education and occupation were the predictors of understanding and consequently up taking the prevention measures.

However, the study findings were almost similar to the study by Rahman and colleagues (2021). They identified three preventive practice challenges as the major ones, which were, lack of protective clothing, overcrowded living spaces and neighborhoods, crowded workspace, and scarce knowledge on the correct use of protective measures. The participants in this study highlighted unavailability of masks which in some cases resulted in inappropriate use of face masks e.g., wearing dirty masks, sharing one mask, washing the single use masks.

The findings of this current study are also consistent with the findings of an exploratory study conducted by Jervin, (2020) communities living in close proximity has challenges with maintaining social disease due to over crowdedness. For example, in Harare Mbare suburb is overcrowded top up with the vegetable market it becomes very difficult to even maintain social distances as a barrier to maintaining social distance.

This present study further identified inadequate sanitation facilities. Although the government mandated temperature checks and hand sanitization on work areas, most residents fail to sanitize their hand at homes as they lack both sanitizers and continuous running water and soap.

Religion and culture are other barriers that were indicated in the study, were negative influences of the society acts as barriers to preventive practices for COVID-19. In Zimbabwe the Apostolic sector is of significant influence to preventative measures like vaccinations and avoiding gatherings. there is quite a number of the population which is controlled either by religion or culture, where some due to their culture are more inclined to use traditional remedies rather than going to a health facility. Consequently,

the use of traditional herbs and other Ayurvedic such as ginger, zumbani, and steaming among others have been widely used and people forgoing vaccinations.

Low income was highlighted as another challenge in this current study, this may be alluded to the fact that Zimbabwean economy has more of self-employed people and many small to medium enterprises. Consequently, following lockdown restrictions or prevention measures of avoiding crowded areas may be difficult when you intend to earn a living. Isolation or quarantines may pose to be a challenge in adherence in high density suburbs where there is overcrowding within house holds

5.3 Conclusions

- The study showed that adherence to COVID 19 prevention measures was low. Knowledge and attitudes were positive and significant predictors of adherence, consequently, it can be concluded that they are barriers to good practice and adherence of the preventative measures.

Social media may increase awareness of preventive measures if information is correctly managed. Sociodemographic factors such as age, educational level, place of residence and health status determine knowledge.

Knowledge influences attitudes towards prevention measures according to the study, consequently the neutral attitudes in this study influenced poor practices and adherence of prevention measures

1 Adherence to prevention measures also varied with socio-demographic like religion, health status and place of residency. It can be concluded that these socio-demographics are associated with adherence as they influenced practice and are barriers which hinder adherence to prevention measures.

From the study it was concluded that the barriers to adherence to COVID -19 prevention measures were, low knowledge, lack of protective clothing, overcrowded living spaces and neighborhoods, crowded workspace, and negative attitude.

A novel disease may be very difficult to contain through treatment, consequently prevention of the spread of the disease may be very effective in curbing the disease, thus effectively controlling morbidity and mortality rates Aravindhan et al., (2021). The novelty and unpredictability of pandemics may strain or cause health systems to fail.

The study results demonstrated that knowledge is an essential determinant of attitudes towards adopting of preventative measures. A statistically significant association between attitude knowledge and adherence was highlighted. The influence of sociodemographic factors, such as age, place of residence, employment status, religion, good health status, on adherence necessitates the need to enforce preventative measures bearing in mind the sociodemographic factors that may hinder or facilitate effective prevention of the disease. Knowledge being so instrumental in the prevention of COVID-19 and up take of positive attitudes it is essential to manage the information that the public gets is accurate and correct.

Thematic analysis of qualitative interview data showed other practices which were used to prevent COVID-19, prayer, steaming, herbs, medicinal prophylaxis and healthy lifestyles among others. Thus, policies or health intervention should base upon empowering knowledge which will influences positive attitudes and a will to control the disease

5.4 Implications

The research identified gaps in COVID-19 prevention, emanating from barriers hindering adherence, this research-based information is vital in tailor making interventions, in public health decisions and in policy formulation. The study identified socio demographic factors which predicted knowledge, attitudes and practice these factors have to be addressed when for example designing, health education and awareness campaigns. The research evaluated practice to prevention measures and found out, that there was poor adherence, based on these findings activities to increase public adherence through appropriate information outlets on continuous bases can be designed. The study will enable researchers in Zimbabwe to draft conceptual frameworks they may use in other towns and cities in Zimbabwe as they explore adherence in other cities.

5.5 Recommendations

There is urgent need to intensify public health education on the prevention measures, as the study highlighted that 38.9% had poor knowledge and that poor knowledge influenced non adherence. Knowledge if equipped to the public it will improve adherence to the set measures

There is need for Ministry of finance in collaboration with Ministry of health and child care to subsidize hand sanitizers, soaps and masks. Consequently, Harare city council should ensure constant water for hand hygiene

Public health officers through the Ministry of Health and child care, use media to demystify the different schools of thoughts on prevention measures and COVID 19 that is spreading on social media.

Evidence from the study shows that knowledge is crucial for the effectiveness of prevention measures, as it impacts attitudes and practices. It is therefore recommended that policy makers and the governments should equip the public as much as possible with accurate relevant information to avoid misleading and false information on social media.

The policy makers and health authority should take advantage of the several social media platforms to train the public on preventative measures. The study also recommends further research to find other factors other than the sociodemographic factors which determine KAP measures.

Effectiveness of the practice of preventative measures, is affected by the challenges highlighted in the study. The majority of the citizens of Harare rely on small business entrepreneurship, consequently adhering to these prevention measures when they affect your income may be difficult likewise lack of resources like masks and sanitizers may hinder adherence, as such the government must ensure the less privileged have access to these basics

There is need to make interventions to motivate behavioral change as the ability to adopt preventative measures by the public is driven by how much they know, what needs to be done and how they view the practices. Believing that the prevention measures are effective is an important predictor of adherence

5.6 Suggestions for Further Research

The virus has been mutating giving either a more virulent strain or a less virulent strain, consequently in all these phases there is bound to be varied knowledge attitudes and

practices due to the virus the study limitation was therefore its time line when the data was actually collected may have not captured both the peak and downs of the pandemic. Therefore, follow up studies may be necessary to capture knowledge, attitudes and barriers to adherence measures and behavior in different waves. The study was only focused in residents from the city of Harare, thus there was need to assess barriers to on preventative measures from rural areas and other cities.

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APPENDIX 1: Research Questionnaire.

AFRICA UNIVERSITY

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

Research title: Knowledge, attitude and practice towards COVID-19 preventative measures in Zimbabwe: A cross-sectional study in Harare.

Introduction

I am Lorraine Ndungwani, a student in Masters in Public Health, at Africa University. I am conducting research on barriers to adherence of COVID-19 preventative measures in Zimbabwe. The study is carried out in Harare. The findings from this study are meant to evaluate knowledge, attitude barriers and adherence to COVID-19 preventative measures with an aim of policy formulation and proffering solutions to curb the pandemic progression. The information generated from this interview will be private and confidential.

Questionnaire Number----

Date ---/----/-------

		YES	NO
1.1.	Have you ever heard of COVID -19?		
2.2.	If yes, from what source? ***(Multiple responses possible)*** (a) family member, (b) newspaper, flyer, (c) radio, television (d) health worker, social media		
3.	Does COVID 19 have a cure?		

Section A: Questions on knowledge

3. Which of the following causes COVID-19? ***(Tick where applicable)***

A. Bacteria ☐ Virus ☐ C. Fungal ☐ D. I Don't know ☐

4. Who do you think is at risk of getting COVID-19? ***(Tick where applicable)***

A. Everyone ☐ dren ☐ ts (18+Years) ☐ D. I don't know ☐

5. Who do you think is at highest risk for Severe Illness of COVID-19? ***(Tick where applicable)***

Everyone	
Children	
Adult s (18-40 years)	
Adults (40+ years)	
People with other diseases	
I don't know	

6. COVID-19 is transmitted through ***(Multiple responses possible)***

Cough droplets after sneezing	
Talking with other people	
Hand shake	
Touching eyes and mouth	

Making, contact with animals	
I don't know	

7. Is COVID -19 curable

8. How can the disease be prevented? ***(Multiple responses possible)***

Wearing masks	
Hands washing, Sanitizers and good hygiene	
Quarantine and social distancing	
Health education	
Wearing PPE	
Travel restrictions	
Getting vaccinated	
Nothing can be done to prevent	

9. Which of the following is a symptom of COVID-19***(Multiple responses possible)?***

Fever		
Itching throat		
Cough		
Flu		
Diarrhea and Vomiting		
Difficulty in breathing		
Pain in the stomach		
Weakness		
Most people don't have symptoms		

10. How long does it take a person with COVID-19 to get symptoms?

One day		
5-14 day		
14+ days		
I don't know		

11. Does COVID-19 have a vaccine? Yes No

	YES	NO
1. If you are tested for COVID-19 and results are positive, would you believe?		
1. If your friend or family member is tested positive for COVID-19, would you believe?		
2. Do believe that COVID -19 is a disease of the whites?		
3. Are vaccines an efficient way of preventing the spreading of COVID 19?		
4. COVID -19 is not a major threat in Zimbabwe and you are not afraid of it?		

5. What is the recommended social distance……...?

Section B. Questions on Attitudes *(Tick one that applies)*

	Score
1. On a scale of 1-10, do you think lock down helped in preventing the spreading COVID-19? (Where, a score of (1-2) is strongly disagree, (3-4) is, Don't agree, (5-6) is Agree and (7-10) is Strongly agree).	
1. How would rate the importance of wearing of masks and sanitizing hands.	
2. On a scale of 1-10, do you think government was right to put up the measures it did to prevent spread of COVID-19?	
3. How would rate the ability of your community to follow all the necessary preventative measures	
4. Government's efforts towards COVID-19 prevention and treatment were effective? Rate your response 1-10	

Section C Questions on Practices *(Tick one that applies).*

1. I stay home when I feel flu-like symptoms Yes ☐ No ☐
2. When I cough or sneeze, I cover my mouth and nose with the; Multiple response

Hands ☐ e of Elbow T☐aper or Handkerchief. ☐

3. How often do you wash your hands with soap?

Always ☐etimes ☐ Never ☐

4. Approximately how many times did you wash your hands or use a hand sanitizer yesterday

5. When was the last time you were in a public gathering/place with more than 2 people?

Today days to 6 days han a week ago

6. When in public I wore a mask

Always mes

7. When in Public, I maintained a distance of at least 2 meters between us

Yes, Always Yes, Sometimes No, Never

09. How difficult is it for you personally to follow the protective measure of staying home/Hand hygiene as much as possible? On a scale of 1-5 rate yourself. ***(1 = not difficult at all <=> 5 = extremely difficult)***

Perceived severity and perceived susceptibility

5. How do perceive COVID- 19?

A very severe low severity COVID 19 is just like the ordinary flu

6. How susceptible are you to COVID-19?

High susceptibility low susceptibility not susceptible at all

	YES	***NO***
Have you ever been tested positive with COVID 19?		
If you get infected with COVID 19, do you think you would not be able to do your daily activities?		
Do you think you are at risk of getting infected?		
Do you think by wearing of a mask or getting vaccinated, will prevent the spread of the disease?		
Do you always avoid crowded spaces always?		
Would you attend a funeral of someone who died of COVID 19?		
Would you not comply with lockdown restrictions so that you earn money?		

2. What is hindering you from adhering to COVID-19 prevention Measures

Shortage of masks	
lack of sanitizers	

lack of information,	
living in crowded spaces,	
religion and culture,	
Need to survive.	

Section C: Socio-demographic

1. Age
2. Sex: Male ……
   Female…….
3. Marital status Single Married Widow
4.
5. Educational level
6.

Primary		
Secondary	A Level	
	O Level	
Diploma		
Undergrad		
Post graduate		

Occupation

Self employed	
Do not work	
Student	
Employed	

7. Place of residence ……
8. Do you have any chronic disease? Yes
9. How would you rate your health status?

APPENDIX 2: 1

INFORMED CONSENT

My name is Lorraine Ndungwani, a final year (MPH) student from Africa University I am carrying out a study on Barriers to adherence to COVID-19 prevention measures in Harare in 2021. I am kindly asking you to participate in this study by answering and filling in the questionnaire provided.

Purpose of the study:
The purpose of the study is to assess and analyse the barriers to adherence to COVID-19 prevention measures, and to assess the level of adherence to practices by the residents in Harare, towards COVID-19 preventative measures. The study therefore seeks to analyse the influence and impact these factors have on the preventative measures towards COVI-19. The study is designed to assess the level of knowledge about COVID-19 prevention in Harare, the attitudes and level of adherence of the public, the study will identify barriers, which makes the preventative measures fail. You were selected for the study because you are willing to participate and a resident of Harare exposed to COVID-19 prevention measures for the past one year. The study has 385 participants from all wards in Harare.

Procedures and duration
If you decide to participate you will be expected to fill in a questionnaire which takes about 10-30 minutes.

Risks and discomforts
There are no risks involved with participating in this study.

Benefits and/or compensation
The study will benefit the public as, the findings from the study will give recommendations to policy makers and health authorities. There will no individualised benefits in cash or kind.

Confidentiality
The study will ensure participant's privacy remains undisclosed in the study any information that is obtained in the study that can be identified with the participant will not be disclosed without their permission. Names and any other identification will not be asked for in the questionnaires.

Voluntary participation
Participation in this study is voluntary. If participant decides not to participate in this study, their decision will not affect their future relationship with the researcher. If they chose to participate, they are free to withdraw their consent and to discontinue participation without penalty.

Offer to answer questions
Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

Authorisation

If you have decided to participate in this study, please sign this form in the space provide below as an indication that you have read and understood the information provided above and have agreed to participate.

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Name of Research Participant (please print) Date

Signature of Research Participant or legally authorised representative

If you have any questions concerning this study or consent form beyond those answered by the researcher including questions about the research, your rights as a research participant, or if you feel that you have been treated unfairly and would like to talk to someone other than the researcher, please feel free to contact the Africa University Research Ethics Committee on telephone (020) 60075 or 60026 extension 1156 email aurec@africau.edu

Name of Researcher LORRAINE NDUNGWANI

Appendix 3
Interviewwer Gguide for key informants

Awareness and knowledge about COVID -19 prevention Measures by the community to prevention measures

What is the level of knowledge for the people in this community towards COVID-19 prevention measures?

……
……
……
……..

How is COVID-19 perceived or viewed?

……
……
……..

Are there any awareness campaigns or health education that have been done recently?

……
……

Where do you get information about COVID 19 and its prevention? .....
.....

Attitudes perceived risk, perceived severity and efficacy of the prevention measures

How do you view COVID-19 disease in terms of the risk of getting the disease and spreading in the community……...?

How does the community perceive the disease and its prevention?

……
……

Do you think prevention measures alone will successfully control the spreading of the disease?

……
……

How are prevention measures viewed and are they considered seriously?.....
.....

How do the community behave in Lockdown and restricted movements?

……

Adherence and practice of the prevention measures

What are the preventative practices that are practiced by the community?.....
.....
.....

What are the commonly not practiced prevention measures in this community by you and the public?

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

Do you always practice wearing of masks, sanitizing hands, avoid crowded places, social distancing and staying home when you are sick?

……
……
……
……

What is your view of getting vaccinated?

.....
.....

Are the residents of this community adhering to the prevention measures?

……
……
……
……
……..

What are the societal factors that influence adherence to prevention measures?

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

Barriers to adherence to COVID -19 prevention measures

What do you consider as the factors that are influencing people not to comply with the prevention measures?

……
……
……
……..

What are the factors hindering you from adhering to prevention measures?

.....
.....

Is it difficult to always practice prevention measures?.....
.....

Appendix 4 Approval letter from AUREC

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: AU2120/21 **16 June, 2021**

Lorraine Ndungwani
C/O CHANS
Africa University
Box 1320
Mutare

RE: **KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS COVID-19 PREVENTATIVE MEASURES IN ZIMBABWE: A CROSSECTIONAL STUDY IN HARARE**

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 2120/21
  This number should be used on all correspondences, consent forms, and appropriate documents.
- **AUREC MEETING DATE** NA
- **APPROVAL DATE** June 16, 2021
- **EXPIRATION DATE** June 16, 2022
- **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.

Yours Faithfully

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC) APPROVED P.O. BOX 1320, MUTARE, ZIMBABWE

MARY CHINZOU – A/AUREC ADMINISTRATORFOR CHAIRPERSON,
AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE