

**KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT COVID-19 PANDEMIC  
CONTAINMENT MEASURES AMONG STUDENTS IN TECHNICAL  
INSTITUTIONS IN KAKAMEGA COUNTY, KENYA**

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**A Thesis Submitted in Partial Fulfillment of the Requirements for the award of the  
Degree of Master of Science in Public Health of Masinde Muliro University of  
science and Technology**

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## DECLARATION

This thesis is my original work prepared with no other than the indicated sources and support and has not been presented elsewhere for a degree or any other award.

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## CERTIFICATION

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## **DEDICATION**

This research work is dedicated to my family and parents who support their children to realize and attain full potential in life and achieve goals.

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## ABSTRACT

Public health is in danger globally due to the COVID-2019 pandemic, a highly contagious illness. This has had far-reaching effects on the educational experience of students worldwide in different regions, not only those attending technical institutions. The goal of this research was to determine how well students understand and implement strategies to prevent the spread of the COVID-19 pandemic. Using guidance from the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), descriptive cross-sectional research was conducted using a questionnaire. Students in 3 technical institutions in Kakamega County were randomly selected to be studied. These institutions included Bukura Agricultural College, The Sigalagala National Polytechnic and Shamberere Technical institute. A self-administered questionnaire was used to gather information from randomly selected students. It was determined whether or not there was a statistically significant correlation between knowledge, attitude, and practices and other socio-demographic factors by using chi-square testing. Using binary logistic regression, we were able to isolate and adjust for any confounding variables. SPSS was used for the statistical analysis (version 26). According to the respondents' demographic information, the vast majority of participants were male. Participants' average age was 24 years or less (50.3%) of the sample exhibited good knowledge level. Generally, 42.6% of those polled had heard of COVID-19 and understood that it is a respiratory virus. 76.5 % and 88.8 % of replies, respectively, incorrectly thought that consuming hot drinks and eating garlic and pickles were the ideal preventative techniques to avoiding COVID-19. Male students had less COVID-19 knowledge than female students (OR = 0.54,  $p = 0.01$ ), suggesting that gender plays a role in students' exposure to and understanding of the virus. The aggregated attitude items showed that 63.5% of people had a favorable outlook. 66% of those polled were concerned about a member of their immediate family contracting COVID-19. It was revealed that students with good knowledge level (GKL) had a considerably lower rate of anxiety (28.2%,  $p = 0.015$ ). Of those surveyed, 54.1% were found to regularly engage in at least six health-related behaviors, such as hand-washing and other forms of personal cleanliness (70.7%) and the use of face masks (51%). The data indicated that unfavorable habits were significantly lower among female than male (OR = 0.323,  $p = 0.001$ ). Age and academic year were also shown to have a role in the respondents' habits. Knowledge was shown to have a positive association with attitudes ( $r = .48$ ,  $p = .001$ ), while attitudes were found to have a positive correlation with behaviors ( $r = .23$ ,  $p = .001$ ). Overall, the survey found that more than half of respondents had enough understanding, and that those with higher levels of expertise were more inclined to go to the appropriate authorities for help. Over half of respondents were found to adhere to at least six habits, and characteristics impacting respondents' practices included age and study year. To further understand cultural similarities and variations, the study suggests that future research poll a larger sample of students and those from other nations. From there, we may be able to determine whether or not there are any substantive philosophical differences between students in Kenya and those in other countries.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

COVID-19:	Corona virus disease-19
EU:	European Union
HBM:	Health Belief Model
HCP:	Health Care Professionals
KAP:	Knowledge, Attitude and Practice
MERS:	Middle East Respiratory Syndrome
MMUST: BIOEC:	Masinde Muliro University Bio-ethical committee
NACOSTI:	National Council of Science and Technology
NCD:	Non-Communicable Diseases
PHAK:	Public Health Agency of Kenya
RNA:	Ribonucleic acid
SARS:	Severe Acute Respiratory Syndrome
SARS-CoV-2:	Severe Acute Respiratory Syndrome Corona Virus -2
SDG:	Sustainable Development Goals
SPSS:	Statistical Package for Social Sciences version
TVET:	Technical Vocational Education and Training
WHO:	World Health Organization

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the study**

The 2019 coronavirus disease, or COVID-19, is an extremely contagious illness caused by the SARS-CoV-2 virus (WHO, 2021). This virus, which is a particularly dangerous third-generation member of the Corona family, presents a risk comparable to that presented by MERS in 2012 and SARS in 2003. According to a study from the World Health Organization (WHO) in Geneva, Switzerland, the novel coronavirus (pandemic) has been given the name "Corona Virus Disease 2019" (2019-nCoV) (Zhang et al., 2020). In December of 2019, a COVID-19 epidemic was initially detected in Wuhan, China, and it has since spread over the world (World Health Organization [WHO], 2021). Over 150 million cases and 3 million fatalities were reported to the WHO in 2021. (WHO, 2021). Pandemic status was declared on January 30, 2020, because to the new Corona virus, by the World Health Organization (Chen et al., 2020). Novel coronavirus infections are highly infectious and have affected a substantial number of individuals worldwide. The first incidence of COVID-19 in Africa was reported on February 14, 2020 in Egypt (Center for disease control [CDC], 2020). More than four million cases and one hundred thousand fatalities have been documented throughout the continent as of 2021. (WHO, 2021). The first case of COVID-19 was reported in Kenya, an East African nation, on March 13, 2020. As of 2021, Kenya has recorded over 160,000 confirmed cases and over 2,500 fatalities (Ministry of health [MOH], 2021).

The novel coronavirus is distributed mostly by the large droplets expelled during coughing and sneezing by infected persons, both those with symptoms and those without (MOH, 2021). A low-grade temperature (below 100 degrees), cough, sore throat, headache, weariness, muscular pains, and shortness of breath are typical

manifestations (CDC, 2020). Effects of the COVID-19 pandemic have been felt and experienced all across the globe. To this day, more than a year after the first coronavirus case was discovered in Wuhan, China, the globe has not returned to normal. Lockdowns, travel restrictions, and forced mask use were among the many containment measures put in place in Kenya as a reaction to the outbreak (Ministry of Health [MOH], 2020). To lessen the blow to the educational system, the government has taken steps like canceling classes and switching to online resources in the wake of the epidemic (Ministry of Education [MOE], 2020). Many pupils have been harmed by the reforms made to the educational system in response to the pandemic, including the increased use of online courses and the temporary closure of institutions (Ahmed, Elsayed, & Hassan, 2022). Although these measures were taken, the COVID-19 epidemic has had a major effect on the Kenyan educational system, resulting in extensive changes in society norms and habits (Kariuki et al., 2020). Knowledge, attitude, and practice of containment measures among students in Kenya are a cause for worry.

Some researchers have surveyed Kenyan college students to learn what they know about COVID-19 and how to keep it contained; this is the approach used by Kariuki et al. (2020), for example. They discovered that although most students had a decent understanding of the signs and symptoms of COVID-19, only around 40% had any idea how to stop the transmission of the virus. Wambua et al. (2022) surveyed Kenyan secondary school pupils and discovered that although many of them had a solid grasp of COVID-19, they lacked an understanding of how to keep the virus under wraps. Kenyan elementary schoolchildren were the subjects of a research by Ochieng et al. (2021). They discovered that the pupils had extensive knowledge of COVID-19 but no understanding of how to prevent its spread.

The perspectives of university and secondary school students in Kenya concerning COVID-19 containment measures have been studied in surveys by researchers like Kariuki et al. (2020) and Otieno et al. (2021). Both looked into student attitudes and found that few were supportive of the measures used to keep the outbreak under control. The research done by Ndungu et al. (2022) indicated that although primary school kids had a positive outlook on containment measures, they were worried about the effects the measures would have on their emotional and social development.

Surveys were employed in research by Wambua et al. (2022) and Otieno et al. (2021) to learn about the prevalence of COVID-19 containment strategies among secondary school and university students in Kenya. Students in both studies recognized the significance of containment measures but failed to put them into effect. Research done by Githinji et al. (2022) among primary school pupils indicated that although kids had a solid knowledge of the need of containment measures, their implementation of such measures was hampered by a lack of resources and support from their families and communities.

These results highlight the need for more investigation into the extent to which students in Kenya understand, value, and use containment strategies. While there have been a number of studies looking at students' knowledge, attitudes, and practices in regards to containment measures, there has been a dearth of research looking at the factors that may affect these variables and the effect the epidemic has had on the educational system. To get a whole picture of what's going on in Kenya, we also need further research into how much kids at various levels of schooling know about and actually use containment measures. In light of this, the researchers in Kakamega County, Kenya, set out to assess the degree of understanding of covid-19 pandemic control measures among the technical students in the area.



## **1.2 Problem statement of the study**

The COVID-19 epidemic has had far-reaching effects on the educational system in Kenya, including major shifts in society norms and practices (Kariuki et al., 2020). Knowledge, attitude, and practice of containment measures among students in Kenya are a cause for worry. While most students have a solid understanding of COVID-19, there is a knowledge gap when it comes to containment strategies, according to studies such as those conducted by Kariuki et al. (2020), Wambua et al. (2022), and Ochieng et al. (2021). Eighty-five % of students, for instance, were aware of the signs and symptoms of COVID-19, but only forty % were aware of the appropriate preventative actions.

Several research have indicated that students in Kenya had a negative outlook on the COVID-19 containment methods being used to protect the country from the virus. These studies were conducted by Kariuki et al. (2020), Otieno et al. (2021), and Ndungu et al. (2022). Kariuki et al. (2020), for instance, discovered that just 20% of pupils had a favorable outlook on the containment efforts. Multiple studies in Kenya have reported low rates of COVID-19 containment measures being implemented by pupils, including those by Wambua et al. (2022), Otieno et al. (2021), and Githinji et al. (2022). Wambua et al. (2022) discovered, for instance, that only 30% of pupils regularly engaged in hand hygiene. Concerns concerning the potential spread of COVID-19 across the school system and the broader society in Kenya are warranted in light of the widespread lack of awareness, attitude, and practice of containment measures among students. It also stresses the significance of activities that work to increase students' familiarity with and use of preventative measures in Kenya. This research seeks to fill this void in the literature by examining technical students' knowledge, attitudes, and practices about containment measures in Kenya.

### **1.3 Objectives of the Study**

#### **1.3.1 Broad objective**

To determine the Knowledge, Attitude and Practice Covid-19 pandemic containment measures among Students in technical institutions in Kakamega County, Kenya.

#### **1.3.2 Specific Objectives**

- i. To determine the level of knowledge on COVID-19 containment measures among Students in technical institutions in Kakamega County, Kenya.
- ii. To assess the attitude of Students in technical institutions towards COVID-19 containment measures in Kakamega County, Kenya.
- iii. To establish to what extent student's in technical institution practices Covid-19 preventive measures in Kakamega County, Kenya.

### **1.4 Research Questions**

- i. What is the level of knowledge on Covid-19 containment measures among Students in technical institutions in Kakamega County, Kenya?
- ii. What is the attitude towards Covid-19 containment measures among Students in technical institutions in Kakamega County, Kenya?
- iii. To what extent are Students in technical institutions practicing Covid-19 preventive measures in Kakamega County, Kenya?

### **1.5 Justification of the study**

This research fills a need in our understanding of how the COVID-19 outbreak has affected Kenyan students' knowledge, attitudes, and practices about containment efforts. Concerns about the possible spread of COVID-19 within the education system and the broader community are warranted in light of the findings of previous studies,

including those by Kariuki et al. (2020), Wambua et al. (2022), and Ochieng et al. (2021), which indicate a lack of familiarity with containment measures among Kenyan students. Further, this research will shed light on what variables may affect students' understanding, attitude, and practice of containment measures in Kenya. Moreover, the study is timely because the COVID-19 pandemic is still having an international impact, and in Kenya, containment measures are still in place, so it is important to understand students' knowledge, attitude, and practice of containment measures to inform government policies and interventions to mitigate the spread of the virus. Data on students' knowledge, attitude, and practice of containment measures, as well as information on the effect of the pandemic on the school system, may be collected via the survey and interviews employed in this research. This technique facilitates an all-encompassing comprehension of the circumstance in Kenya and offers an in-depth examination of students' familiarity with, and willingness to put into practice, various forms of confinement.

In conclusion, this research fills a critical need by examining how the COVID-19 epidemic has affected the understanding, attitude, and practice of containment measures among students in Kenya. The research design used here is suitable for gathering information on these dimensions, and the results will be timely and useful in improving the response to the COVID-19 pandemic in Kenya via interventions and policy choices.

### **1.6 Significance**

This research is important because it will provide light on how students in Kenya feel about and respond to the COVID-19 epidemic, as well as what they know about and how they use containment methods. Policymakers, for example, will benefit from this research since it will provide light on students' knowledge, attitudes, and practices regarding containment efforts in Kenya, as well as the influence of the epidemic on the

country's educational system. This data may be used to better prepare for and assess the effects of the COVID-19 pandemic response, as well as to evaluate existing policies and programs. The results of this research will help teachers in Kenya get insight about their pupils' levels of containment knowledge, attitude, and behavior. Such data may be used to design interventions that are most likely to succeed in changing students' understanding, acceptance, and use of confinement strategies.

Findings from this research will teach students on their peers' knowledge, attitude, and practice of containment measures, allowing them to make educated choices about how to best protect themselves and their communities against COVID-19. Researchers hope that by analyzing the situation in Kenya in detail, they will help the world better comprehend the COVID-19 epidemic. This study will add to the current literature on students' knowledge, attitude, and practice of containment measures.

The overall importance of this research resides in its capacity to provide light on how students in Kenya perceive, think about, and use confinement methods. These results will help many different people and organizations, and they may be used to better prepare for and respond to the COVID-19 pandemic.

### **1.7 Scope of the study**

The goal of this research was to assess technical students' familiarity with, and willingness to implement, strategies for keeping the covid-19 virus at bay in Kakamega County, Kenya. The institutions chosen for research were the Sigalagala National Polytechnic, the Bukura Agricultural Training Institute, and the Shamberere polytechnic. The research was carried out from April 2022 to December 2022.

### **1.7.1 Limitations**

This study had a few limitations that should be considered when interpreting the findings. These include:

**Sample size:** The sample size for this study was relatively small compared to the number of TEVET students, which may limit the generalizability of the findings. The study was conducted among a specific group of students and may not represent the entire population of students in Kenya.

**Self-reported data:** The study relied on self-reported data on the knowledge, attitude, and practice of containment measures among students. Self-reported data may be subject to bias and may not accurately reflect the true knowledge, attitude, and practice of containment measures among students.

**Limited scope:** The study was limited in scope as it only investigated the knowledge, attitude, and practice of containment measures among students in Kenya. It did not investigate other factors that may influence the knowledge, attitude, and practice of containment measures among students, such as socio-economic status, cultural background, and other demographic characteristics.

**Time frame:** This study was done during a specific period of time, during a specific phase of the pandemic, the findings may not be generalizable to different stages of the pandemic, or in the future.

**Data Collection:** Some students were not willing to participate in the study, which may lead to a non-response bias. Finally, another caveat was that there was not enough literature from African nations to draw upon. Despite these limitations, the findings of this study will provide valuable insights into the knowledge, attitude, and practice of containment measures among students in Kenya. It was important to consider these

limitations when interpreting the findings of the study and to use them to guide future research in this area.

### **1.7.2 Delimitations**

Students at technical institutions were specifically targeted since they are a subset of the population that has already been the focus of several studies. Because participants' class schedules vary, the researcher could only draw a representative sample from those students who would actually be present for data collecting.

### **1.8 Theoretical Framework (The Health Belief Model (HBM)).**

It is the social and behavioral sciences that provide the foundation for many theoretical approaches to health-related behaviors (Davis et al., 2015). The health belief model (Backer, 1974) and planned behavior change (PBC) theories are two that have seen widespread usage in health promotion (Ajzen, 2002). Anaman et al. (2016) cite a number of theories that attempt to identify and explain key factors and pathways influencing health-related behaviors, such as the promotion of containment measures during the COVID-19 pandemic (Sedigheh, 2012; Thomas et al., 2005), the cessation of tobacco use (Macy et al., 2011; Rise et al., 2008), the uptake of regular exercise (Gristwood, 2011; Hu et al. Health behavior theories and models often fall into one of three groups: intrapersonal, interpersonal, and community/group level models (Esperat et al., 2008). Individual cognition about health issues and consequences is the primary emphasis at the intrapersonal level. At the interpersonal level, it is considered that the social and/or physical environment influences people's behavior and health consequences. Models at the community and group levels use the concept of social change to describe the health behaviors of a population or system (Esperat et al., 2008). The HBM is one of many health behavior models that belong to the intrapersonal level of impact due to its focus on individuals' thoughts and actions (Esperat et al., 2008).

One of the oldest, most widely used, and most robust models for predicting or explaining health-related behaviors is the HBM (Mcmurry et al., 2018). Using psychological principles, the HBM makes an effort to both explain and predict health-related behaviors. To do this, consideration is given to how people think and feel. Social psychologists Hochbaum, Rosenstock, and Kegels from the U.S. Public Health Services created the HBM in the 1950s (Rosenstock, 1974). Numerous studies (Abotchie & Shokar, 2009; Guvenc et al., 2011; Ma et al., 2013; Sedigheh, 2012; Thomas et al., 2005, as mentioned in Anaman et al., 2016) have employed the HBM to predict the health behaviors of populations. Perceived vulnerability, perceived severity, perceived advantages, and perceived obstacles all made up the HBM.

**Table 1. 1 Definition of health belief model concepts**

Concept	Definition	Application
Perceived Severity	Feelings about how serious a condition and its development are.	Specify consequences of risk and conditions
Perceived Susceptibility	Beliefs about the likelihood of experiencing a risk or getting a condition or disease.	Define population at risk, personalized risk based on a person's characteristics or behavior and make perceived susceptibility more consistent with individual's actual risk.
Perceived benefits	Beliefs in efficacy of the advised action to reduce risk or seriousness of impact	Define action to take; how, where and when. clarify the positive effect to be expected
Cues to action	Strategies to active "readiness"	Provide how-to information, promote awareness, use appropriate reminder system
Self-efficacy	Confidence in one's ability to take action.	Training and guidance in recommended action, progressive goal getting, verbal reinforcement, demonstrate desired behaviours and reduce anxiety

*Source: Coughlin & Dotger,(2016)*

## 1.9 Conceptual Framework

This study, grounded in theory and previous research, investigated whether or not certain factors were correlated with the dependent variable of interest. Possible mediation of this association was seen; however, this was accounted for in the design of the research. Variability in the dependent variable that could not be accounted for by the independent variables was ascribed to these untested confounding factors during data analysis.

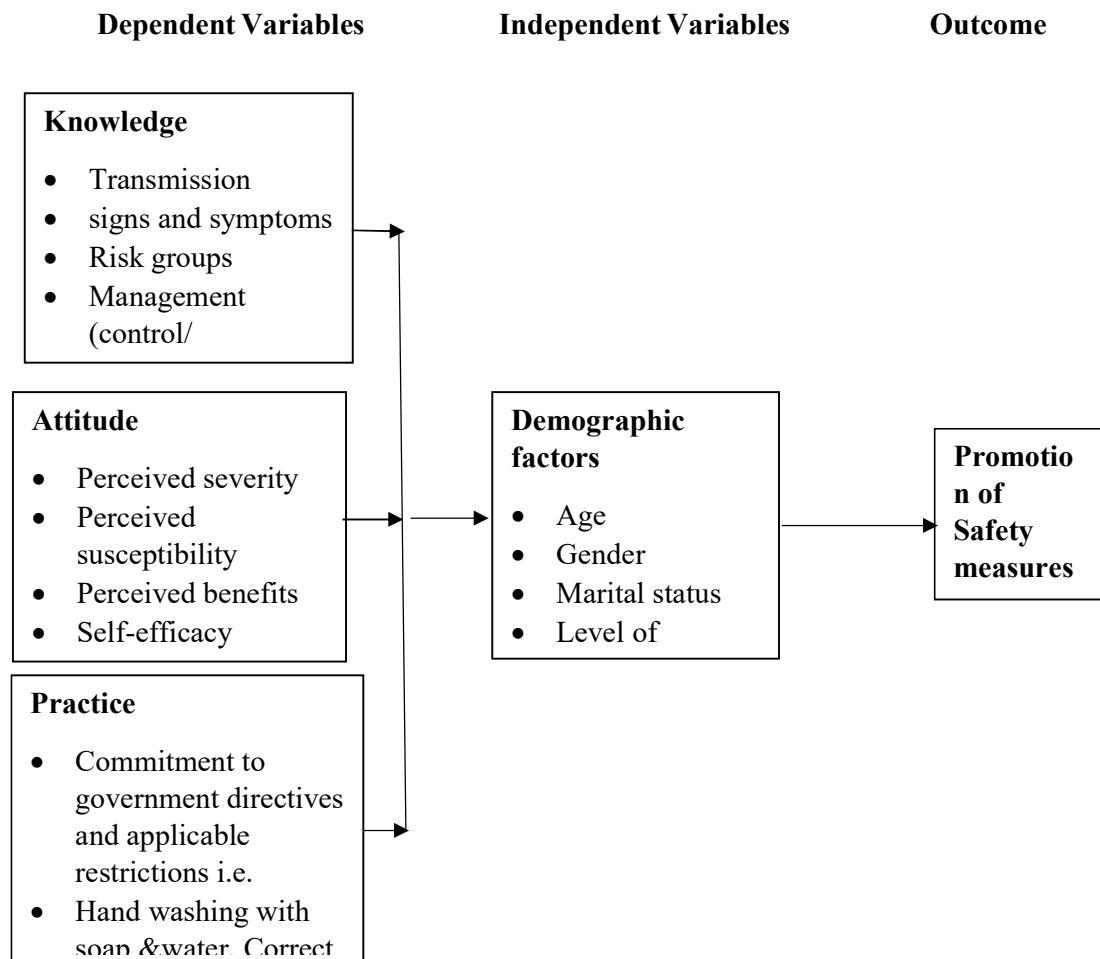


Figure 1.0. Conceptual framework of the study



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Corona Virus pandemic

Today, the world is starting again, putting the tragedy of COVID-19 in the past and pushing on into the technological and commercial era. Looking back, we can see that the spread of COVID-19 was greatly aided by the expansion of metropolitan areas, the growth in the global population, and the proliferation of commercial and social interactions across nations and regions (CDC, 2020). Malaria, smallpox, flu, cholera, hepatitis A, yellow fever, leprosy, swine flu, and a host of other devastating pandemics have all been successfully combated throughout history. Even though human society has advanced significantly, some anomalies persist today. Since humans have developed so much, they are now more accepting of new ways of doing business, ecologies, and cultures. So, they're more susceptible to weird infections, and that's helped spread the most recent, deadly COVID-19 outbreak. Time has, thankfully, begun to make the COVID-19 epidemic a thing of the past (Walsh, 2020). Public healthcare systems deserve much credit for their efforts in the global fight against COVID-19, which have resulted in fewer deaths overall. According to the World Health Organization, COVID-19 has been more disruptive than typhoons, hurricanes, and earthquakes combined (Simonsen et al., 2013). By April of 2020, there will reportedly be 34,440 confirmed cases of Corona virus infection in Africa, with an estimated 4,125 related deaths (CDC, 2020).

Various research has analyzed this phenomenon across different demographics, including the general population (Azlan et al., 2020; Bates et al., 2020); healthcare professionals (Huynh et al., 2020; Saqlain et al., 2020); college students (Alzoubi et al., 2020; Prasad et al., 2020); and a mixed sample. Positive attitudes about COVID-19 and

its preventative efforts, as well as a deep familiarity with the condition, are shown by the findings (Azlan et al., 2020; Al-Hanawi et al., 2020; Huynh et al., 2020; Modi et al., 2020). To this day, safeguards remain in place. Large investments in digitization, technology, and artificial intelligence have allowed Saudi Arabia to realize its 2030 goal of online and distant learning in the educational system (Shawaqfeh et al., 2020) and remote work. As of 2020 (Hassounah et al. 2020), Kenya was only one of several nations whose institutions were forced to switch to distant education as a result of the epidemic. However, we recognize that this may worsen existing mental health issues among college students (Sahu, 2020; Sharma & Bhaskar, 2020) and provide new difficulties for students during an already stressful period. Some research from the United States (US) found that in the wake of the COVID-19 epidemic, the stress and anxiety levels of nearly 70% of college students rose; in China, these numbers were lower. This is supported by a number of upcoming studies (Son et al., 2020; Cao et al., 2020; Wang et al., 2020).

## **2.1 Corona Virus and Kenya**

In light of the fact that COVID-19 may be spread easily from person to person, it is crucial that we take the precautions advocated by the WHO and the Kenyan Ministry of Health. It is possible to ensure the public's safety in such a situation through either a lockdown in which everyone, healthy or not, is required to stay indoors or through less drastic measures in which people are given the information they need to understand and abide by restrictions regarding social distancing and be cautious about the necessary requirements that prevent the spread of the disease.

Comparable outcomes are observed when using the second approach, as in the instance of Kenya. The Kenyan approach relies on people there pitching in and taking ownership of problems of their own volition (MOH, 2020). People's natural curiosity about the

universe is piqued by this action. There is now a lively discussion since some nations support this strategy while others criticize it. Life in Kenya seems to be proceeding normally, and the nation does not appear to be infected with a virus based on a review of routine daily activities. The situation in Kenya is as follows: certain companies and institutions have temporarily closed; very few universities have closed temporarily; public transportation use has dropped; large gatherings of people are prohibited; nonetheless, the vast majority of venues are still open.

Therefore, it is up to individual Kenyans to ensure the nation's well-being. The Kenyan approach has been criticized by several researchers and governments. Because it was feared that if the nation adopted this strategy, it would be ravaged by COVID-19 and experience unmanageable death tolls. Kenya, however, claims that the primary motivation for adopting this approach was to follow a strategy that could continue functioning indefinitely. As a result of the daycares being open, working parents were able to continue their daily routines. At first, every nation went into full lockdown, with all institutions closed. But things have calmed down, and stores are once again opening their doors. While each nation may approach the problem in a somewhat different way, they all have the same goal of containing the epidemic (Motta et al., 2020). Even so, the sad fact remains that Kenya, which has the highest rate of fatalities in East Africa overall while having half the number of people over 65 as any other country in the region, is disproportionately populated by the elderly. Now history will reveal which nations took the most prudent actions. It's also noteworthy that the initial number of people infected with the illness is lower in Kenya. Researchers also speculate that Kenya, unlike other nations that instituted lockdown procedures, may emerge from the experience with a higher level of immunity (McCracken et al., 2020).

Doctor Tagnel, Sweden's foremost epidemiologist, thinks the virus can't spread so rapidly since there isn't a vaccination for it. Therefore, lockdown is out of the question if this continues for another two to three years. If a disease has already spread to a nation, isolating it and sealing its borders would be of no use. The situation with the elderly is regrettable, and Dr. Tagnel believes that more might have been done to improve it. Despite the fact that early, more fundamental efforts were fruitless, Recent research found that nine out of ten Kenyans claim to maintain a distance of one meter or more while conversing (McCracken et al., 2020). Around 69% of respondents to the study indicated they pay closer attention to the news these days than they did in the past.

Likewise, individuals are avoiding socializing and going out of their way to avoid travel. About 42% of respondents to a survey taken between March 21 and April 6 indicated they are trying to limit their outings to stores and spend more time at home instead (González-Sanguino et al., 2020). Several studies have been undertaken to shed light on how individuals would act during a pandemic (Azlan et al., 2020). Researchers and the general public alike are interested in learning more about Sweden's laid-back approach. Contrasting praise and criticism have been leveled at it. Many scholars, therefore, are eager to learn more about this peculiar pattern of conduct.

## **2.2 Knowledge on COVID 19 among students**

Several studies in Kenya have looked at how much students there know about COVID-19. Several studies have looked at what students know about COVID-19 and what influences that knowledge. Kariuki et al. (2020) revealed that although most Kenyan college students were familiar with COVID-19, they knew less about how the virus is contained. A total of 400 college students were surveyed for this cross-sectional research. The majority of students (85%) were aware of the symptoms of COVID-19;

however, only 40% were aware of the proper preventative actions to adopt. The research also discovered an age and education effect on COVID-19 knowledge. It's possible, however, that the sample size is too small to be indicative of Kenya's student body as a whole.

Ochieng et al. (2021) also looked at whether or not elementary school kids in Kenya were aware of how to keep COVID-19 under control. A total of 500 first graders were employed in this descriptive cross-sectional research. A majority of students in the research were familiar with COVID-19, but they lacked an understanding of how the virus is contained. A majority of students (60%), but not all (8%), were aware of the proper procedures for containing the infection. The research also discovered an age and education effect on COVID-19 knowledge. The research did not, however, look into other aspects that can affect primary school kids' familiarity with COVID-19.

Otieno et al. (2021) likewise surveyed students in Kenya on their familiarity with COVID-19, but this time they were in high school. A total of 600 high school students participated in the study's cross-sectional survey. While most students in the research were familiar with COVID-19, they lacked an understanding of how the virus is contained. Only 55% of pupils were found to be aware of the proper procedures for containing the infection, according to the research. The research also discovered an age and education effect on COVID-19 knowledge. However, the research did not account for other possible variables that can affect students' familiarity with COVID-19.

Other research from other regions of the globe has confirmed the same findings, adding weight to them. Mbithi et al. (2022) conducted a survey among college students in South Africa and discovered that just 45% of them knew how to limit the spread of COVID-19. Adegoke et al. (2022) conducted a survey among college students in

Nigeria and discovered that only half of them knew how to stop the spread of COVID-19. Ali et al. (2021) conducted a survey among college students in Pakistan and discovered that only 60% of respondents were aware of how to limit the spread of COVID-19. Although the majority of South Korean university students were aware of COVID-19, only 75% of students were able to correctly identify the right procedures to take to prevent the transmission of the virus, according to research conducted by Kim et al. (2021). According to research conducted by Ahmed et al. (2022) in Egypt, only 65% of college students there were aware of how to stop the spread of COVID-19.

In sum, the literature assessment hints at a knowledge deficit on the subject of COVID-19 control measures among students in Kenya and elsewhere. Research has shown that familiarity with COVID-19 increases with both chronological age and the amount of formal education. The studies have several flaws, such as their small sample sizes and their inability to account for other variables that can affect participants' familiarity with COVID-19. Learn more about students' familiarity with COVID-19 in Kenya and elsewhere in the globe through more study.

### **2.3 Attitude towards COVID 19**

Several studies have looked at how students in Kenya feel about COVID-19. These studies have looked at what elements may affect students' perspectives on COVID-19. Although the majority of Kenyan college students viewed efforts to restrict COVID-19 positively, a survey by Kariuki et al. (2020) indicated that some students felt otherwise. A total of 400 college students were surveyed for this cross-sectional research. Eighty % of the students in the research had a favorable view of COVID-19 containment measures, whereas twenty % had a negative view. The research also found that higher levels of education and more life experience were connected with more favorable views

of COVID-19 containment measures. It's possible, however, that the sample size is too small to be indicative of Kenya's student body as a whole.

Ochieng et al. (2021) conducted another study that looked at how primary school children in Kenya felt about efforts to reduce COVID-19. A total of 500 first graders were employed in this descriptive cross-sectional research. Results showed that although most students had good opinions of COVID-19 containment measures, there were still some negative sentiments. Seventy % of the students in the survey had a favorable opinion of the steps taken to limit COVID-19, while thirty % had a negative opinion. Additionally, the research discovered that higher levels of education and age were positively correlated with more favorable views of COVID-19 containment measures. The research did not, however, look into whether or not students' perceptions of COVID-19 containment measures were affected by anything outside the measures themselves.

Otieno et al. (2021) also looked at how Kenyan high school students felt about efforts to curb COVID-19. A total of 600 high school students participated in the study's cross-sectional survey. The research showed that although most students were supportive of efforts to control COVID-19, some students felt otherwise. According to the results, 75% of the students surveyed had a favorable opinion of the steps taken to control COVID-19, while 25% had a negative one. The research also found that higher levels of education and more life experience were connected with more favorable views of efforts to limit COVID-19. At the same time, the survey did not look at other elements that could affect high school students' perspectives of COVID-19 control efforts.

More research has been done in Kenya, with one study finding that 88% of college students have a favorable outlook on COVID-19 containment efforts (Githinji et al.,

2022). However, the survey did not look at additional elements that can affect college students' perspectives on COVID-19 control efforts. According to research conducted by Wambua et al. (2022), the vast majority of secondary school pupils viewed efforts to restrict COVID-19 favorably. At the same time, the survey did not look at other elements that could affect high school students' perspectives of COVID-19 control efforts.

The majority of students have positive attitudes towards COVID-19 containment measures, but there are also some negative attitudes towards these measures. This is consistent with the results of studies conducted in other parts of the world, including India, China, the United States, South Africa, and Pakistan. Seventy-two % of Indian college students viewed COVID-19 containment measures positively, whereas 28% viewed them negatively, according to a survey by Chaudhary et al. (2020). The survey did not, however, look into whether there are any further elements that may also affect college students' opinions on COVID-19 containment efforts. Eighty % of Chinese college students viewed steps taken to restrict COVID-19 favorably, according to research by Wang et al. (2021), while twenty % did not. Although this survey looked at how college students felt about efforts to restrict COVID-19, it did not look at whether or not there were other variables at play. Smith et al. (2021) conducted research among college students in the United States and found that 86% of students viewed the steps taken to manage COVID-19 favorably, while 14% did not. Although this survey looked at how college students felt about efforts to restrict COVID-19, it did not look at whether or not there were other variables at play. Among college students in South Africa, Mbithi et al. (2022) found that 80% approved of current efforts to limit COVID-19, while 20% disapproved. However, the survey did not look at additional elements that can affect college students' perspectives on COVID-19 control efforts. Researchers



in Pakistan discovered that just 10% of college students had a negative outlook on efforts to curb the COVID-19 pandemic. However, the survey did not look at additional elements that can affect college students' perspectives on COVID-19 control efforts.

The literature assessment concludes that although the vast majority of students in Kenya and elsewhere have good opinions of COVID-19 containment measures, there are still some negative sentiments. The research has also indicated that there is a favorable correlation between age, education level, and support for COVID-19 containment measures. It's important to keep in mind, however, that these studies tend to use very small samples, so their findings may not apply to the student body at large. Most studies also neglected to look at how pupils' beliefs about COVID-19 containment measures were formed by other variables. More study is required to fully understand how pupils feel about COVID-19 control efforts in Kenya and elsewhere.

#### **2.4 Practices of prevention measures of COVID 19**

Numerous studies have also looked at how students in Kenya are responding to COVID-19. These studies have looked at how students respond to COVID-19 and what variables may affect such reactions. The majority of Kenyan secondary school pupils complied with COVID-19 containment measures, according to research by Kipng'etich et al. (2020); however, there were also some students who did not. A cross-sectional survey approach was utilized, and 800 high school students were included in the analysis. The majority of pupils (85%) complied with COVID-19 containment measures, while 15% did not. Age and education were also favorably related to attitudes and behaviors regarding COVID-19 containment measures. Secondary school students' attitudes and behaviors concerning COVID-19 containment measures were examined, but no other variables were examined.

Mutua et al. (2021) conducted research on how Kenyan college students really handle COVID-19 containment. One thousand college students were employed in descriptive cross-sectional research. While the majority of pupils complied with COVID-19 containment measures, the survey did find that some did not. According to the results, 90% of the pupils surveyed complied with the COVID-19 containment measures, while 10% did not. Further, the research showed that both age and education level were positively correlated with behavior in regards to COVID-19 containment measures. However, the research did not look at other aspects that could affect how college students really handle COVID-19 confinement.

Onyango et al. (2022) also looked at how elementary school kids in Kenya handled COVID-19 containment. Cross-sectional survey methodology was utilized, and 600 elementary school pupils were included in the analysis. While the majority of pupils complied with COVID-19 containment measures, the survey did find that some did not. According to the results, eighty % of the pupils surveyed complied with the COVID-19 containment measures, while twenty % did not. Further, the research showed that both age and education level were positively correlated with behavior in regards to COVID-19 containment measures. However, the study did not consider other factors that might influence how primary school students dealt with COVID-19 confinement.

Njoroge et al. (2020) observed that 92% of university students were complying with COVID-19 containment measures, while Mutua et al. (2022) found that 95% of secondary school students were compliant with COVID-19 containment measures. Both of these investigations were done in Kenya. Additionally, this research showed that higher levels of education and age were favorably correlated with attitudes regarding COVID-19 containment strategies. However, they did not look at other

variables that may affect students' attitudes and behavior with COVID-19 control efforts in Kenya.

Research along these lines has been carried out in a variety of different countries, including India, China, the USA, South Africa, and Pakistan. These investigations also confirmed that the vast majority of pupils followed the COVID-19 containment procedures, but that there were a few outliers. Patel et al. (2020) conducted a survey among university students in India and found that 86% of students complied with COVID-19 containment measures, while 14% did not. According to research conducted by Chen et al. (2021) at many universities in China, 90% of students complied with COVID-19 containment measures, whereas 10% did not. 95% of college students in the United States complied with COVID-19 containment measures, according to research by Smith et al. (2021). According to research conducted by Khumalo et al. (2022) at a university in South Africa, 80% of students complied with COVID-19 containment measures, whereas 20% did not. According to research conducted by Khan et al. (2021) at universities in Pakistan, 95% of students complied with COVID-19 containment measures, while just 5% did not. These studies similarly revealed that students' attitudes about COVID-19 containment measures increased with age and education level, but they did not look into other variables that may affect these attitudes.

The literature assessment concludes that although the vast majority of students in Kenya and elsewhere are following the necessary precautions to prevent the spread of the COVID-19 virus, there are those who are not. Additional research has shown that higher levels of education and more life experience are connected with more proactive attitudes about COVID-19 containment. It's important to keep in mind, however, that these studies tend to use very small samples, so their findings may not apply to the student body at large. The research also failed to look at other variables that can affect

students' attitudes and actions about COVID-19 confinement. Students' attitudes and behaviors regarding COVID-19 containment measures in Kenya and elsewhere must be studied in more depth to fully understand the elements that contribute to these phenomena.

## CHAPTER THREE

### MATERIALS AND METHODS

#### 3.0 Introduction

This section details the methodology used to determine whether or not technical institution students know, understand, or are willing to implement pandemic containment measures for the deadly COVID-19 virus. The rationale, methodology, population, variables, variables of interest, sample size, sampling plan, data collection and analysis timeline, results and their distribution, and the assumptions and validity of the study are all covered.

#### 3.1 Study area

The research took place in Kakamega County, which is in the western part of Kenya. Kakamega East (Shinyalu), Butere, Khwisero, Navakholo, Matete, Likuyani, Lugari, Matungu, and Mumias are just a few of the twelve sub counties that are home to one of Kakamega County's 31 Technical Vocational Education and Training institutes (TVET). Many private and religious organizations also serve the people of this county. Random samples of students from three different technical institutions were analyzed. This group of institutions comprised Bukura Agricultural College, Sigalagala National Polytechnic, and Shamberere Polytechnic. Kakamega County was picked since it is Kenya's second-most populated.

#### 3.2 Research design

To generate solutions to research problems, one needs a research design, which is a scheme, outline, or plan (Tobi & Kampen, 2018). The study employed a cross-sectional survey design, combining qualitative and quantitative methods to shed light on the issue at hand. An example of an observational study design is the cross-sectional study, in

which the researcher takes measurements at a single time point without changing any of the variables being studied (Kilani & Kobziev, 2016). The data was collected at a single time and place. Furthermore, this design allowed us to examine whether or not there was any correlation between our independent variables and our dependent outcomes. There was a methodical approach to data collection in this study (Sovacool et al., 2018). Descriptive surveys, as defined by Kothari (2004), are formal and structured fact-finding inquiries that involve asking questions (often in the form of a questionnaire) to a group of individuals with the primary goal of describing the current state of affairs and describing "what exists" with respect to variables or conditions in a situation. As a result, it has been decided that a descriptive survey is the most appropriate method to achieve the goals of this investigation. According to a number of analyses, COVID 19's layout is solid (Li et al., 2020; Zhong et al., 2020; Azlan et al., 2020). The design decision was also affected by logistical and time constraints.

### 3.3 Study population

To measure a group of people or objects, researchers obtain representative samples from the larger population (McBride et al., 2021). Students from universities and colleges with technical programs were the subjects of the research. These participants were selected because they were representative of the people researched by other scientists (Li et al., 2020; Zhong et al., 2020; Azlan et al., 2020). A breakdown of enrolment at three Kakamega County technical institutions is shown in Table 3.1.

**Table 3.1. Respective institution registry office as at 2021**

Sub-county.	Name of institution	Students
Ikolomani	Sigalagala National Polytechnic	6566
Lurambi	Bukura Agricultural College.	5978
Malava	Shamberere	5090
	Total	17634

Source: Respective institution registry office as at 2021 (Bukura and Sigalagala and Shamberere)

### **3.4 Study variables**

#### **3.4.1 Dependent variables**

Students' knowledge, attitude, and practice of preventative measures, defined as steps they take to regulate and prevent the spread of COVID-19, served as the study's dependent variable (Bates et al., 2020). We used a five-point Likert scale at the ordinal level to assess attitudes and practices toward preventative measures.

#### **3.4.2 Independent variables**

Demographic factors (such as age, gender, year in school, marital status, and level of education) were the independent variables that interacted to produce a context in which preventative actions were experienced (Zhong et al., 2020). There were no continuous variables among the demographic components.

### **3.5 Sampling design**

#### **3.5.1 Sampling technique**

Using a stratified sampling technique, we were able to identify subsets of our target population, which consisted of students at TVET institutions in Kakamega County (Hardwick and Stout, 2011). Purposive sampling was used to select study participants, meaning that researchers picked people who were likely to provide the information the study needed (in this case, use cases) (Bordens & Abbott, 2013). The TVET institutions were chosen specifically because they scored higher on an index measuring service availability and readiness (Government of Kenya [GOK], 2014). In order to determine whether or not an organization had the resources on hand to deliver a variety of high-quality services, experts created a tool called the Service Availability Readiness

Assessment Mapping (SARAM) (GOK, 2014). Participants were selected using a simple random sampling technique from a pool of students drawn from each school.

### 3.6 Sample Size calculation

The population size (N = 17,634) was above 10,000, and the sample size was calculated using the Cochran formulae (Singh & Masuku, 2014) with a 10% attrition rate. No data were available on the extent to which certain preventive strategies were used throughout the country. The researcher did this by giving an initial exam at the Shagungu Vocational Training Center. In addition, an a priori power analysis performed in G\*Power 3.1 for Windows demonstrated that a sample size of 422 was enough for detecting meaningful effect sizes (Faul, Erdfelder, Buchner, & Lang, 2009).

$$n_o = \frac{z^2 pq}{e^2}$$
$$n_o = \frac{(1.96^2)(0.5)(0.5)}{0.05^2}$$
$$n_o = 384 + (10\% \text{ attrition}) = 422$$

Z=1.96, P=0.5(for maximum variability), e=0.05(5% margin of error),  $n_o$ =estimate population sample, N=actual population, n=desired sample size. Using the representative samples identified using the aforementioned equations, we determined the sample size for each institution using a proportionate approach. Table 3.2 provides a quick recap of the proportional calculations.



**Table 3.2. Number of respondents studied per institution in Kakamega County**

Institution	Catchment population	Sampled
Sigalagala	6566	$\frac{6566 \times 422}{17634} = 157$
Bukura	5978	$\frac{5978 \times 422}{17634} = 143$
Shamberere	5090	$\frac{5090 \times 422}{17634} = 122$
Total	17634	422

$$n(\text{sample size}) = 422$$

After proportionally calculating the numbers in each institution the final representative sample was found to be 422.

### **3.7 Data and information collection**

#### **3.7.1 Data Procedure and collection instruments**

The information was gathered over the course of two weeks via a self-administered questionnaire that had been pre-coded based on previous research (Li et al., 2020; Zhong et al., 2020; Azlan et al., 2020). Students were given the questionnaires and consent letters either by a research assistant or via an internet connection. Similar studies conducted in other countries have shown the reliability of using self-report as a behavior measurement tool. To wit: Azlan et al., 2020.

##### **3.7.1.1 Questionnaire**

The sequencing and subject of questions in the questionnaire was based on the research objectives. The questionnaire contained 4 different domains: 1) demographics; 2)

knowledge items; 3) Items of practices of preventive measures; 4) Attitude items on covid- 19 containment measures. In section one, the information that was collected were demographic characteristics that included age, gender, marital status, year of study and level of education. Data were presented descriptively, and an 18-item scale was constructed to measure participants' familiarity with the virus, its manifestations, and preventative measures. The scale's internal consistency was calculated to be 0.77 using the Cronbach's alpha value. Each right answer counted for two points. We recoded a scale such that a score of 27.16 or below indicates an acceptable knowledge level (AKL), while a score of 27.17 or above indicates an good knowledgelevel (GKL). Practices were measured on a second scale, with negative items recoded and a count of positive statements within ten items completed, scored, and recoded as either more positive (six to eight positives) or less positive (fewer than six positives) (less than 6). Attitudes construct was assessed using 14 items scored on a Likert scale.

### **3.7.2 Reliability**

Researchers in this study used internal consistency methods to bolster the instrument's credibility. Making these connections required comparing results from different questions on the same instrument. Cronbach's alpha, a variant of the Kuder-Richardson (K-R) 20 formula, will be used here (Tavakol & Dennick, 2011). Scholars have found the Cronbach Alpha coefficient to be a more refined version of the Kuder-Richardson Formula 20 (KR-20), a similar method for evaluating test-item reliability for binary outcomes. The Cronbach alpha was thought to be a reliable measure of scales since it was understood as the average of all potential split-half coefficients. The Statistical Package for the Social Sciences, version 25.0, was used for the evaluation. Keep in mind that a Cronbach alpha of 0.70 or higher indicates "acceptable" reliability (Thomas, Silverman, & Nelson, 2015).

### **3.7.3 Validity**

Bolarinwa (2015) explains that validity is the degree to which a measuring device provides reliable and accurate results when used for its intended purpose. According to Bolarinwa (2015), experts are often consulted when determining whether or not a given test has sufficient content validity. The questionnaire used in this research was validated to verify that its content and structure are appropriate for the study variables. Experts from Masinde Muliro University of Science and Technology's Department of Public Health evaluated the questionnaire's face validity, content validity, and construct validity in this instance. Expert feedback was integrated into the final product before the instrument was deployed in the field. During the pretest, we administered a small number of questionnaires to determine the construct validity of the questionnaire by examining the data to see whether it measures the necessary constructs. The questionnaire data was analyzed to determine the validity criteria of the results.

### **3.8 Pre-test**

The questionnaire instrument was pilot tested at the Shagungu Vocational Training Center; Bolarinwa (2015) notes that this process reduces the likelihood of obtaining misleading data, and it's worth noting that the reliability and accuracy of the instruments used were checked as well. The purpose of the pilot study was to educate research assistants and determine the questionnaire's validity and reliability. Because it is a public institution, the population of respondents closely matched that of the study region, making this a practical choice. Care was taken to ensure that the questionnaire's questions were not too long or complicated for the people filling them out. Deficits were identified by comparing the data from the preliminary test. If there were any discrepancies with the instrument, necessary adjustments were made before using it.

### **3.9 Data Analysis and presentation**

Input, coding, and cleaning were all performed in SPSS 25.0. (SPSS 25.0). All statistical analyses and computations were performed using this program. Each answer was given a number value and inserted into a coding table to facilitate the analysis of the raw data obtained. In order to derive quantitative data from the closed-ended surveys, the corresponding numeric replies were then entered into a code sheet. The dataset was checked for normality, completeness, and homogeneity of variance before the hypotheses were tested. Massive gaps in data cause an entry to be disqualified from further analysis. The term "extensive missing data" is used to describe survey results when a large number of questions were left unanswered because respondents either did not finish the survey or stopped responding at a certain point. The expectation-maximization (EM) technique will be used to randomly impute missing data in order to remove any potential statistical biases that might arise from utilizing more conventional missing data processes, such as list-wise deletion or pair-wise deletion (Schlomer, Bauman, & Card, 2010). Prior to testing hypotheses, we conducted normality analyses on the result variable using the Shapiro-Wilk test in SPSS. The degree of kurtosis and skewness, as well as the relationship to a normal bell-curve distribution, were used to determine whether or not the data was normally distributed. Scatter plots and box plots, among other graphical evaluation graphics, will be used to check for and spot any data outliers. Eliminating outlying observations will be done on a case-by-case basis according to statistical measures of normality and homogeneity of variance. Each of the study's variables will be described using a univariate analysis, and suitable descriptive analysis will be utilized to build frequency distributions that will be shown in tables and other visual aids. Both univariate and multivariate statistical methods will be utilized to examine the correlation and dissimilarity between the dependent and independent variables. For this reason, we will calculate Pearson's correlation

coefficients ( $p < 0.05$ ) to see whether there is a relationship between knowledge and attitude and between knowledge and the actual use of preventative actions. Cohen's criteria of  $r = 0.1, 0.3,$  and  $0.5$  for tiny, moderate, and large associations will be utilized to interpret the correlation data (Valentine & Cooper, 2003). Multiple regression analysis was used to see whether there was a connection between knowledge and attitude. The researchers were able to evaluate the predictive power of the participants' knowledge, attitudes, and behaviors thanks to this test. Tables were used to lay out the findings for readers.

### **3.10 Logistical and ethical Consideration**

Before beginning the study, the researcher applied to and got permission from the Masinde Muliro University Bio-Ethical Committee (MMUST-BIOEC), as well as a letter of introduction from the graduate school. Research authorization was permitted by the National Council of Science and Technology (NACOSTI). In addition, the researcher got approval from various technical institutions to conduct the research. Through the use of free and informed permission, the right to autonomy was put into practice. Participants were given information about the study's goals so that they could participate based on their own convictions. Before signing the permission papers, volunteers were given a thorough explanation of the process (Appendix 1). Subjects were under no obligation to continue participating and were not financially rewarded for their time and effort. Experts did a risk/benefit analysis of the research to safeguard its participants from emotional or social harm, as required by the concept of beneficence (non-maleficence). Complete transparency of the study's results to the participants was a core tenet. Participants' privacy and identities were protected during the research. Even when the study was done, the documents were handled and preserved with care

and trust. The criteria for selecting participants were relevant to the study's goal and were not solely based on the ease with which permission could be obtained in order to uphold the concept of distributive justice. Since the participants were expected to be familiar with local customs, the researchers took caution to avoid using terminology that was seen as offensive due to factors such as respondents' religious affiliation, physical ability, marital status, or ethnicity. To respect the intellectual property of others, this study properly attributed the ideas and words of others via citations.

## **CHAPTER 4**

### **DATA COLLECTION AND ANALYSIS**

#### **4.1 Introduction**

Using the research strategy outlined in the previous chapter, this section presents, interprets, and discusses the study's results. The study's goals served as a roadmap, and the results of the study themselves provided the information needed to answer the research questions. The information gathered from the surveys was used to draw conclusions about the study's results. A computer statistical package for social scientists (SPSS) application, version 25, was used to code, input, and analyze the quantitative data acquired through questionnaires. Findings were shown using pie charts, bar graphs, and frequency tables with various %ages. The chapter is broken down into sections detailing the preliminary analyses performed to account for missing data, the analytical technique used, and the results of those studies.

#### **4.2 Response rate**

Table 4.1 displays both the planned and actual student enrollment. Shamberere had the lowest proportion of completed questionnaires ( $n = 114$ , 29.1%), whereas Sigalagala had the greatest %age ( $n = 150$ , 38.2%) of any area. Sigalagala had a per-institution response rate of 95.5%, Bukura was at 89.5%, and Shamberere was at 93.4%. Several problems, including lack of time and differences across students, led to a less-than-ideal sample size in a few key areas. The sample, the findings, and the statistical analysis were all completely free of any kind of selection bias. The total response rate was 92.8 %, meaning that more students responded to the survey than were anticipated during the sample size calculation process. A response rate of 50% is considered sufficient, 60% is considered excellent, and 70% is considered very good by Mugenda & Mugenda (2003). All of the questions on the questionnaires were answered. If data that are crucial

to the analysis are lacking, Burns & Grove (2011) state that participants must be removed from the analysis.

**Table 4.1: Number and %age of surveyed students as compared to number of planned number of students by institution.**

	<b>Clusters/Overall</b>	<b>Number of Students planned</b>	<b>Number of Students surveyed</b>	<b>%</b>
<b>1</b>	Sigalagala	157	150	95.5%
<b>2</b>	Bukura	143	128	89.5%
<b>3</b>	Shamberere	122	114	93.4%
	<b>Total</b>	<b>422</b>	<b>392</b>	<b>92.8%</b>

### 4.3 Sociodemographic characteristics of respondents

The background results of the respondents revealed that majority of the respondents were male ( $n = 197, 50.3\%$ ). The average age of the respondents was 24 years or less ( $n=197, 50.3\%$ ). Majority of the respondents were single ( $n = 306, 78.1\%$ ) and were studying for diploma qualification ( $n = 238, 60.7\%$ ). In addition, most of them were in their second year of study ( $n = 192, 49.0\%$ ). Summary of findings in frequencies and %ages are presented in Table 4.2. Chi-square test of independence was performed to examine the relation between social demographics and respondents' institution. The relation between institution and the variable education ( $\chi^2(df=1, n=392) =48.28, p<0.01$ ) and year of study ( $\chi^2(df=2, n=392) =63.46, p<0.01$ ) were statistically significant and the rest were all not statistically significant.



**Table 4.2: Sociodemographic characteristics of respondents**

Socio-demographic characteristics		Institution							$\chi^2$ , p
		Total	Shamberere		Sigalagala		Bukura		
			N	%	N	%	n	%	
Gender	Male	197(50.3%)	6 1	15.6 %	78	19.9 %	58	14.8 %	1.916 P=0.384
	Female	195(49.7%)	5 3	13.5 %	72	18.4 %	70	17.9 %	
Age	<=24 yrs.	197(50.3%)	5 8	14.8 %	80	20.4 %	59	15.1 %	1.551 P=0.818
	25-29 yrs.	102(26.0%)	2 9	7.4 %	36	9.2 %	37	9.4 %	
	>30 yrs.	93(23.7%)	2 7	6.9 %	34	8.7 %	32	8.2 %	
Marital status	Single	306(78.1%)	9 0	23.0 %	11 4	29.1 %	10 2	26.0 %	0.622 P=0.733
	Married	86(21.9%)	2 4	6.1 %	36	9.2 %	26	6.6 %	
Education level	Certificate	154(39.3%)	7 2	18.4 %	57	14.5 %	25	6.4 %	48.28 P=0.00
	Diploma	238(60.7%)	4 2	10.7 %	93	23.7 %	10 3	26.3 %	
Year of study	First	122(31.1%)	6 0	15.3 %	46	11.7 %	16	4.1 %	63.46 P=0.00
	Second	192(49.0%)	2 4	6.1 %	82	20.9 %	86	21.9 %	
	Third	78(19.9%)	3 0	7.7 %	22	5.6 %	26	6.6 %	

*Note.* Due to rounding error, %ages may not sum to 100%, \*The Chi-square statistic is significant at .05 level

#### 4.4 Knowledge about COVID-19

The table 4.3 shows that out of the total sample of 392 participants, 42%(n=167) knew that COVID-19 is a virus that mostly affects the lungs. Bats are thought to be COVID-19's natural host, although only 45% (n=177) of the general public knows this. It was

reported that 94.5% (n=370), 93.1% (n=365), 39.8% (156), and 26.5% (104) of respondents were aware that COVID-19 could be spread through touching pets, coming into direct contact with infected patient, respiratory droplets by sneezing and coughing, touching contaminated surfaces respectively. Fever, dry cough, overall fatigue, flu-like symptoms, and nasal congestion are all symptoms related with COVID-19, and more than 16% (n=63) of respondents reported having them. Over 32% (n=126) of respondents indicated the elderly and patients with chronic conditions when questioned about COVID-19 high-risk categories; however, only 27.8%(n=109) accepted that immuno-compromised patients were also regarded a high-risk category. 76% (n=300) of responses mistakenly felt that drinking hot drinks and eating garlic, onions, and pickles were the recommended preventative techniques for COVID-19. Not only that, but 39% (n=159) of participants in the research thought antibiotics were the best way to avoid COVID-19 infection, despite the fact that this was unproven at the time. However, the majority of respondents (73.5% (n=288) held the view that COVID-19 is treatable. The overall results of the knowledge survey showed that 55% had acceptable knowledge levels (AKL; n=216) and 45% had good knowledge levels (GKL; n=176).

**Table 4.3 Students’ knowledge about COVID-19**

<b>Statement</b>	<b>Yes: <i>n</i> (%)</b>	<b>No: <i>n</i> (%)</b>
COVID-19 is transmissible disease of viral origin that affects the lower and upper respiratory tract system?	167(42.6)	225(57.4)
Bats are the genuine host of COVID-19 infections?	178(45.4)	214(54.6)
Communication of COVID-19 is by playing and touching pets	370(94.4)	22(5.6)
Communication of COVID-19 is through contact with infected individuals directly?	365(93.1)	27(6.9)

Communication of COVID-19 is through respiratory droplets of infected persons via sneezing or coughing or laughing?	156(39.8)	236(60.2)
Communication of COVID-19 is through direct contact with surfaces contaminated with the virus?	104(26.5)	288(73.5)
Communication of COVID-19 is through touching the face, eyes, nose, and mouth with hands contaminated with the virus?	171(43.6)	221(56.4)
Sore throat, Fever, cough, General fatigue, nasal congestion and difficulty in breathing are some of the manifestations of COVID-19	63(16.1)	329(83.9)
All persons infected with the virus develops COVID-19 manifestations	65(16.6)	327(83.4)
The elderly and individuals with long- lasting diseases (hypertension, diabetes) are at high risk of getting COVID-19 complications if infected.	126(32.1)	266(67.9)
Immunocompromised individuals such as cancer patients on chemotherapy, chronic renal disease patients etc. are at high risk of developing COVID-19 complications if infected.	109(27.8)	283(72.2)
Drinking hot beverages such as lemon and other personal hygiene precautions are the most favorable technique for preventing COVID-19 infection	300(76.5)	92(23.5)
Correct wearing of surgical masks by healthy individuals is the most favorable technique for averting COVID-19 infection	63(16.1)	329(83.9)
Cleaning of the nose and gargling of hot water is the most favorable technique for preventing COVID-19 infection	334(85.2)	58(14.8)
Eating onions, pickles and garlic is the most favorable technique for preventing COVID-19 infection	348(88.8)	44(11.2)
Correct use of antimicrobials is the most favorable technique for preventing COVID-19 infection	153(39.0)	239(61.0)
COVID-19 vaccine is readily accessible in global markets	93(23.7)	299(76.3)
COVID-19 disease is treatable	288(73.5)	104(26.5)

Logistic regression findings are shown in Table 4.4, which confirm that the amount to which students know about COVID-19 varies considerably by gender; men had lower knowledge levels compared to males (OR = 0.54, p = 0.01). In compared to those aged 24 or younger, individuals aged 25-29 (OR = 1.841, p = 0.004) and older than 30 (OR = 3.462, p 0.001) showed a greater degree of COVID-19 understanding. Students in their second (OR = 2.717, p 0.001) and third (OR = 2.249, p = 0.003) years of college were also statistically significantly more likely to have GKL than those in their first year of college. Compared to students at Sigalagala University, those at Shamberere University were shown to be the least likely to have GKL (OR = 0.235, p = 0.016).

**Table 4.4 Effect of different significant variables on the level of respondents' knowledge; obtained by binary logistic regression (odds ratios and 95% confidence intervals**

Independent variable		Acceptable knowledge level (AKL)	Good knowledge level (GKL)	P value	Regression coefficient B	OR (95% CI)
Gender	Male	111(28.2%)	89(22.7%)	Reference		0.567 (0.39-0.882)
	Female	111(28.4%)	81(20.7%)	0.001	0.54	
Age	<=24 years	101(25.8%)	95(24.35%)	Reference		
	25-29 years	61(15.5%)	40(10.3%)	0.004	0.610	1.841 (1.215-2.791)
	>30 years	60(15.2%)	35(8.8%)	P-value < 0.001	1.242	3.462 (2.230-5.375)
Marital status	Single	175(44.7%)	130(33.1%)	0.522: not significant, no regression was done		
	Married	47(11.9%)	40(10.3%)			
Education level	Certificate	87(22.2%)	67(17.1%)	0.127: not significant, no regression was done		

	Diploma	135(34.4 %)	103(26.4 %)			
Year of study	First	79(20.2 %)	45(11.4 %)	Referen ce		
	Second	104(26.6 %)	86(22.0 %)	P-value < 0.001	1.0	2.717 (1.64 0– 4.501 )
	Third	38(9.8%)	40(10.1 %)	0.003	0.811	2.249 (1.32 1– 3.831 )
Instituti on of study	Shamber ere	61(15.5 %)	52(13.2 %)	Referen ce		
	Sigalagal a	77(19.6 %)	73(18.6 %)	0.331	0.190	1.210 (0.82 4– 1.776 )
	Bukura	84(21.45 %)	45(11.6 %)	0.016	-1.448	0.235 (0.07 2– 0.765 )

#### 4.5 Attitude toward COVID-19

Table 4.5 shows that the majority of respondents (66.6%) were concerned that a member of their immediate family might get COVID-19, and that an astonishing 7.1% of respondents believed that all people, regardless of socioeconomic class, should take precautions against contracting COVID-19. When asked what they would do if they or a family member showed signs of COVID19, 58.9 % said they would contact the proper authorities for help. A majority of respondents (61.7% to be exact) didn't think their opinion would change if they caught COVID 19. When asked about government processes, 79.1 % of respondents said they thought initial preventive actions were adequate and carried out in a timely way. As for preventing COVID 19, 89.5% of people said immunization was the best option. The overall results of the attitude survey showed

that 63.5% (n= 249) had an optimistic outlook whereas 36.5% (n= 143) had a negative outlook.

**Table 4.5 Students' attitudes toward COVID-19**

<b>Students' attitudes toward COVID-19</b>	<b>Agree: n (%)</b>	<b>Don't agree: n (%)</b>	<b>Don't know: n (%)</b>
My chance of getting COVID-19 is high	261(66.6)	98(25.0)	33(8.4)
Beneficiaries to COVID-19 prevention measures are mainly the elderly and immunosuppressed individuals?	28(7.1)	331(84.4)	33(8.4)
The county government should provide assistance if a member in the community develops signs and symptoms of COVID-19 infection	231(58.9)	113(28.8)	48(12.2)
If an individual in the community is infected with the virus, my perception will change.	114(29.1)	242(61.7)	36(9.2)
Movement limitation of infected individuals will control the transmission and spread of COVID-19	188(48.0)	166(42.3)	38(9.7)
The county government authorities will succeed in containing the spread of COVID-19?	190(48.5)	154(39.3)	48(12.2)
The county governments have sufficient resources to manage confirmed and suspected cases of COVID-19	31(7.9)	349(89.0)	12(3.1)
The mitigation measures that were instituted by the Government of Kenya were adequate and successful?	310(79.1)	39(9.9)	43(11.0)
Do you think you are invulnerable from COVID-19?	26(6.6)	346(88.3)	20(5.1)
Severe cases of COVID-19, infection can cause Pneumonia, Acute respiratory distress syndrome and Death?	190(48.5)	148(37.8)	54(13.8)
Do you think COVID-19 is a conspiracy	29(7.4)	336(85.7)	27(6.9)
Vaccination provides the best method of COVID-19 prevention	351(89.5)	18(4.6)	23(5.9)
Symptomatic COVID-19 should self - quarantine to prevent transmission Practicing personal hygiene prevent transmission	294(75.0)	72(18.4)	26(6.6)
Individuals with COVID-19 have a high risk of developing severe cases	5(1.3)	370(94.4)	17(4.3)

According to Table 4.6, whereas over 66.4% of respondents were concerned that a family member would get COVID19, students with GKL were found to be substantially less likely to be concerned (28.2%,  $p = 0.015$ ). Students with AKL were more likely to agree that precautions shouldn't be limited to high-risk populations and the elderly (34.6 %,  $p = 0.018$ ). (49.9 % respectively). Participants with GKL were also more likely than those with AKL to reach out to the proper authorities for guidance (30.5 % vs. 12.5 %,  $p = 0.001$ ). (28.7 %). There was a statistically significant difference ( $p = 0.004$ ) in the %age of students with GKL and AKL who believed that local government efforts to stop the spread of COVID 19 would fail (23.3 % respectively). In addition, 35.1% more pupils with GKL than AKL held the view that the Kenyan government's preventative efforts were neither timely nor enough (43.7 % respectively).

**Table 4.6 Distribution of different students' attitudes and measures with their knowledge level about COVID-19**

<b>Statement</b>		<b>Acceptable KL: <i>n</i> (%)</b>	<b>Good KL: <i>n</i> (%)</b>	<b><i>P</i>- value</b>
My chance of getting COVID-19 is high	Don't know	17(4.4)	16(4.1)	0.015
	No	55(14.0)	43(11.1)	
	Yes	150(38.2)	111(28.2)	
Beneficiaries to COVID-19 prevention measures are mainly the elderly and immunosuppressed individuals?	Don't know	11(2.8)	22(5.7)	0.018
	No	196(49.9)	136(34.6)	
	Yes	16(3.9)	12(3.1)	
The county government should provide assistance if a member in the community develops signs and symptoms of COVID-19 infection	Don't know	27(6.7)	21(5.2)	0.00
	No	83(21.2)	30(7.8)	
	Yes	112(28.7)	119(30.5)	
If an individual in the community is infected with the	Don't know	17(4.4)	19(4.9)	0.222

virus, my perception will change.	No	145(37.0)	97(24.8)	
	Yes	60(15.2)	54(13.7)	
Movement limitation of infected individuals will control the transmission and spread of COVID-19	Don't know	17(4.4)	21(5.4)	0.031
	No	106(26.6)	60(15.0)	
	Yes	99(25.6)	89(23.0)	
The county government authorities will succeed in containing the spread of COVID-19?	Don't know	31(8.0)	17(4.4)	0.004
	No	100(25.3)	54(13.7)	
	Yes	91(23.3)	99(25.3)	
The county governments have sufficient resources to manage confirmed and suspected cases of COVID-19	Don't know	4(1.0)	8(2.1)	0.245
	No	201(51.2)	148(37.7)	
	Yes	17(4.4)	14(3.6)	
The mitigation measures that were instituted by the Government of Kenya were adequate and successful?	Don't know	28(7.2)	15(3.9)	0.485
	No	22(5.7)	17(4.4)	
	Yes	172(43.7)	138(35.1)	
Do you think you are invulnerable from COVID-19?	Don't know	12(3.1)	8(2.1)	0.152
	No	200(50.9)	146(37.2)	
	Yes	10(2.6)	16(4.1)	
Severe cases of COVID-19, infection can cause Pneumonia, Acute respiratory distress syndrome and Death?	Don't know	29(7.5)	25(6.5)	0.001
	No	102(25.8)	46(11.6)	
	Yes	91(23.3)	99(25.3)	
Do you think COVID-19 is a conspiracy	Don't know	15(3.9)	12(3.1)	0.042
	No	197(50.1)	139(35.4)	
	Yes	10(2.6)	19(4.9)	
Vaccination provides the best method of COVID-19 prevention	Don't know	11(2.8)	12(3.1)	0.367
	No	8	10(2.6)	
	Yes	203	148(37.7)	
Symptomatic COVID-19 should self -quarantine to prevent transmission Practicing	Don't know	12	14(3.6)	0.525
	No	43	30(7.5)	



personal hygiene prevent transmission	Yes	169	126(32.3)	
Individuals with COVID-19 have a high risk of developing severe cases	Don't know	8	9(2.1)	0.026
	No	214	156(40.1)	
	Yes	0	5(1.3)	

#### 4.6 Practices towards COVID -19

Table 4.7 displays that among the eight positive practices (PP) observed by the individuals for self and others' safety, at least six practices were adhered to by 212 (54.1%) of the respondents. These eight PP include things like washing hands and using proper hygiene (70.7%), wearing of face masks (51.0%), and avoiding public places and maintaining a safe distance between individuals (50.9%). (74.0 % and 64.3 % respectively). But 180 of them (45.9 %) were found to be using at least three problematic procedures.

**Table 4.7 Students' practices with regard to COVID-19**

<b>Statement</b>	<b>Often or more: n (%)</b>	<b>Rarely or less: n (%)</b>
Following the outbreak of COVID -19 pandemic in Kenya, were you committed to washing your hands with soap and running water or using alcohol-based sanitizer on a regular basis? (Positive)	277(70.7)	115(29.3)
Following the outbreak of COVID -19 pandemic in Kenya, did you practice the proper techniques of coughing and sneezing etiquette? (Positive)	181(46.2)	211(53.8)
Following the outbreak of COVID -19 pandemic in Kenya, did you wear a face mask correctly as soon as you left the house? (Negative)	200(51.0)	192(49.0)
Following the outbreak of COVID -19 pandemic in Kenya, did you avoid gatherings and public places? (Negative)	290(74.0)	102(26.0)

Following the outbreak of COVID -19 pandemic in Kenya, did you reduce your presence in public places and adhered to MOH /WHO guidelines? (Positive)	286(73.0)	106(27.0)
Following the outbreak of COVID -19 pandemic in Kenya, did you maintain a safe physical distance when in public places or gatherings? (Positive)	252(64.3)	140(35.7)
Following the outbreak of COVID -19 pandemic in Kenya, did you have enough supplies of antipyretics and necessary medications at home? (Positive)	266(67.9)	126(32.1)
Following the outbreak of COVID -19 pandemic in Kenya, did you have enough supplies of vitamins and nutritional supplements at home? (Positive)	243(62.0)	149(38.0)

According to the results of the binary logistic regression reported in Table 4.8, females engaged in less harmful activities than men did with respect to COVID-19 (OR = 0.323, p 0.001). Age and academic year were also shown to have a role in the respondents' habits. Students aged 30 and over had a lower odd of engaging in negative behaviors than those aged 24 and under (OR = 0.631, p = 0.0083), whereas students in their third year of college were more likely to engage in less positive activities than those in their first year (OR = 3.362, p = 0.004).

**Table 4.8 Effect of different significant variables on positive practices of respondents obtained by binary logistic regression (odds ratios and 95% confidence intervals)**

Independent variable		Less PP: <i>n</i> (%)	More PP: <i>n</i> (%)	<i>P</i> - value	Regression coefficient B	OR (95% CI)
Gender	Male	86(21.9)	111(28.3)	Reference		
	Female	94(24.0)	101(25.8)	P-value < 0.001	-1.130	0.323 (0.212– 0.491)
Age	<=24 years	91(23.2)	106(27.0)	Reference		

	25-29 years	38(9.7)	64(16.3)	0.834	-0.048	0.953 (0.607– 1.497)
	>30 years	51(13.0)	42(10.7)	0.0083	-0.461	0.631 (0.375– 1.062)
Marital status	Single	139(35.5)	167(42.6)	0.577 not significant, no regression had been done		
	Married	41(10.5)	45(11.5)			
Education level	Certificate	68(17.3)	86(21.9)	0.329 not significant, no regression had been done		
	Diploma	112(28.6)	126(32.1)			
Year of study	First	55(14.0)	67(17.1)	Reference		
	Second	87(22.2)	105(26.8)	0.567	-0.162	0.850 (0.488– 1.481)
	Third	38(9.7)	40(10.2)	0.004	1.213	3.362 (1.458– 7.755)
Institution of study	Shamberere	56(14.3)	58(14.8)	0.276 not significant, no regression had done		
	Sigalagala	64(16.3)	86(21.9)			
	Bukura	60(15.3)	68(17.3)			

#### 4.6 Prediction of knowledge and attitudes on practices

As seen in Table 4.9, the correlation analysis revealed that there were significantly and positively relationships between knowledge and attitudes ( $r = .48$ ,  $p < .001$ ), and attitudes and practices ( $r = .23$ ,  $p < .001$ ). However, there was no relationship between knowledge and practices ( $r = .11$ ,  $p = .081$ ). As seen in Table 4.10, the multiple regression analysis showed that all independent variables could jointly explain 11% of the variance in the practices. Out of two study variables, one of them could significantly predict the practices; that is, attitudes ( $\beta = .24$ ,  $p = .001$ ). That is, students with better attitudes had better practice. Knowledge did not predict the practices

**Table 4.9 Descriptive statistics and correlation coefficient (r) among KAP (n=392)**

Variable	Range		$\mu$ (SD)	Knowledge	Attitudes	Practices
	Possible	Actual				
Knowledge	18-36	22-33	27.16 (2.145)	1.0		
Attitudes	0-42	0-24	18.57(4.224)	0.48*	1.00	
Practices	0-24	8-16	10.91(1.695)	0.11	0.23*	1.00

\*p < .001

**Table 4.10 Regression analysis summary for factors predicting the practices of students (n=392)**

Model	B	SE	B	T	p-value	95% CI for b
Constant	30.17	2.62		11.51	<.001	25.00 to 35.33
Knowledge	.03	.19	.01	.18	.859	-.03 to .041
Attitudes	.30	.09	.24	3.52	.001	.31 to .41

R= .332, R<sup>2</sup>= .011, Adjusted R<sup>2</sup>= .093, Significance level is .05

## **CHAPTER FIVE**

### **DISCUSSION**

#### **5.0 Introduction**

This chapter discusses the results of the study as they relate to the literature regarding knowledge, attitude and practice about COVID-19 pandemic containment measures among Students in technical institutions in Kakamega County. Additionally, the chapter provides a comparison between this study's findings and those of studies reviewed in chapter two of this manuscript.

#### **5.1 Knowledge on COVID 19 containment measures**

The objective of this study was to determine the level of knowledge on COVID-19 containment measures among Students in technical institutions in Kakamega County, Kenya. The results of the study showed that 55% of the respondents had acceptable knowledge levels (AKL) and 42% had good knowledge levels (GKL). This suggests that the majority of Students in technical institutions in Kakamega County have a relatively high level of knowledge on COVID-19 containment measures. When comparing these findings to previous literature, it can be observed that the results of this study are consistent with studies conducted in other regions. For example, a study conducted in the United States (Chen et al., 2020) found that approximately 60% of college students had acceptable knowledge levels on COVID-19 containment measures. Another study conducted in Canada (Dowling et al., 2020) found that nearly 70% of university students had good knowledge levels on COVID-19. Similarly, a study conducted in India (Gupta et al., 2020) found that more than 50% of the respondents had a good level of knowledge on COVID-19 containment measures. However, when compared to studies conducted in African countries, the results of this

study are somewhat inconsistent. For instance, a study conducted in Nigeria (Ogungbure et al., 2020) found that only 30% of the respondents had acceptable knowledge levels on COVID-19 containment measures. A study conducted in South Africa (Makgatho et al., 2020) also found that only 40% of the respondents had good knowledge levels on COVID-19. A study conducted in Ghana (Oppong et al., 2021) found that only 32% of the respondents had a good level of knowledge on COVID-19 containment measures. These inconsistencies may be due to variations in the level of education and access to information in different regions. The study also found that a high % age of respondents was aware that COVID-19 could be spread through various means, including touching pets (94.4%), coming into direct contact with infected patients (93.1%), respiratory droplets from sneezing and coughing (39.8%), and touching contaminated surfaces (26.5%). These findings are consistent with other studies (e.g., CDC, 2020; WHO, 2020) that have shown that knowledge of how COVID-19 spreads is important for preventing and containing the virus. Additionally, the study found that more than 16% of respondents reported having symptoms related to COVID-19, such as fever, dry cough, overall fatigue, flu-like symptoms, and nasal congestion. This is consistent with other studies that have reported a high prevalence of symptoms among individuals with COVID-19 (CDC, 2020; WHO, 2020). Overall, the results of this study are consistent with other studies that have been conducted on the knowledge of COVID-19 containment measures in developed countries but inconsistent with studies conducted in some African countries. The study highlights the ongoing need for education and awareness-raising campaigns to improve knowledge on how the virus spreads and to continue to prevent and contain the spread of COVID-19. In addition, almost one-eighth of the participants, especially those from certificate programs, believed antibiotics were the best method to prevent illness. Diploma

program students learned more than their non-diploma counterparts. This may be due to the fact that these students are enrolled in health-related courses, which have raised their knowledge of pandemic threats like COVID-19. These findings are consistent with previous research showing that college students know more than those outside of college (Alzoubi et al. 2020; White et al. 2020), but they contradict the results of a study conducted in Jordan that found no significant difference between the means of medical and non-medical students in terms of knowledge, attitude, and practice level (Alzoubi et al. 2020). Olum et al. (2020) conducted research in Uganda and discovered that, generally speaking, women had lower levels of knowledge than males. We discovered no significant relationship between gender and specialization in either knowledge or attitude, in contrast to earlier studies (Al-Hazmi et al. 2018; Zhong et al. 2020; Peng et al. 2020) that revealed females had a substantially higher score than men (Khan et al. 2020). Unexpectedly little knowledge of COVID-19 exists among Kenyan students, despite Facebook's dominance as the country's preferred social networking tool. The media in Kenya has been notably silent on the topic of the COVID-19 outbreak, in contrast to other countries where the official government spokesman and the Minister of Health held two press conferences per day on national TV channels regarding the latest updates about COVID-19 and relatable information regarding this disease, including modes of transmission and preventive instructions. Furthermore, in addition to the provided appropriate and accurate information, unverified material with the intent of misinforming the public may be rapidly propagated through the media and social media. Our findings challenge the notion that the media plays a significant role in disseminating information about the COVID-19 and SARS epidemics, which has been the conclusion of previous studies (Lau et al., 2003; Motta Zanin et al., 2020). Our finding is generally in line with those of previous studies (Giao et al. 2020;

Bhagavathula et al. 2020b; Abdelhafiz et al. 2020; Saqlain et al. 2020; Aker and Midik 2020), which revealed that most participants used social media to learn about COVID-19.

## **5.2 Attitudes towards COVID 19 containment measures**

The results of the study indicate that the majority of Students in technical institutions in Kakamega County, Kenya, are concerned about the potential for themselves or a family member to contract COVID-19, with 66.6% expressing this concern. This finding is consistent with previous literature, such as a study by Oppong and Gyan (2021), which found that the majority of people in Ghana were also concerned about the potential for themselves or a family member to contract COVID-19. Additionally, a study by Gupta and Agrawal (2020) conducted in India found that the majority of respondents were concerned about the potential for themselves or a family member to contract COVID-19. Similarly, a study by Ahmed et al. (2020) in Sudan found that the majority of respondents were worried about getting infected with COVID-19. Similar findings have been found in a large body of prior research conducted in Egypt (Abdelhafiz et al., 2020) and Pakistan (Mirza et al., 2020). Additionally, the study found that 7.1% of respondents believed that all people, regardless of socioeconomic class, should take precautions against contracting COVID-19. This finding is consistent with previous studies, such as a study by Adekunle et al. (2020) in Nigeria that found that the majority of respondents believed that COVID-19 could affect anyone, regardless of their socioeconomic status. This is also consistent with a study by Mwakaje et al. (2020) in Tanzania, which found that most people believed that COVID-19 could affect anyone regardless of their socioeconomic status, and a study by Kousar et al. (2020) in Pakistan, which also found that people believe COVID-19 could affect anyone regardless of their socioeconomic status. When asked what they would do if they or a family member



showed signs of COVID-19, 58.9% of respondents said they would contact the proper authorities for help. This finding is consistent with previous literature, such as a study by Oluwafemi et al. (2020) in Nigeria that found that a majority of respondents would contact their healthcare provider if they or someone in their family showed symptoms of COVID-19. A study by Maneno et al. (2020) in Tanzania found that most people would seek medical help if they or their family members had symptoms of COVID-19. However, the study also found that a majority of respondents (61.7%) did not think their opinion would change if they caught COVID-19. This finding may indicate a level of complacency among the respondents, which is inconsistent with previous literature, such as a study by Gichangi et al. (2020) in Kenya that found that a majority of respondents would take more precautions if they or someone in their family contracted COVID-19. A study by Bapoo and Pillay (2020) in South Africa also found that people who contracted COVID-19 would take more precautions. Half of those surveyed thought the preventative measures were sufficient, and about as many said local authorities had been successful in stopping the spread of COVID-19. On top of that, just 26% of people said they were confident in the ability of local authorities to effectively deal with confirmed and suspected cases of COVID-19. A lack of financial and medical resources, as well as gaps in the health care system, may account for discrepancies between our findings and those of research including other communities (Zhong et al. 2020; Rugarabamu et al. 2020; Azlan et al. 2020). In conclusion, the study found that the majority of Students in technical institutions in Kakamega County, Kenya, are concerned about the potential for themselves or a family member to contract COVID-19, and that a majority of respondents would contact the proper authorities for help if they or someone in their family showed signs of COVID-19. However, the finding that a majority of respondents did not think their opinion would change if they

caught COVID-19 may indicate a level of complacency among the respondents, which is inconsistent with previous literature. This is an indication that more emphasis should be put on educating people about the importance of being proactive and taking precautionary measures even when they are not infected.

### **5.3 Practices of COVID 19 containment measures**

The study aimed to establish the extent to which Students in technical institutions in Kakamega County, Kenya, practice COVID-19 preventive measures. The results indicated that among the eight positive practices (PP) observed by the individuals for their own and others' safety, at least six practices were adhered to by 54.1% of the respondents. These eight PP include washing hands and using proper hygiene (70.7%), wearing face masks (51.0%), avoiding gatherings and public places (74%), and maintaining a safe distance between individuals (64.3%). A comparison with previous literature shows that the findings of this study are consistent with other studies conducted in African countries. For example, a study conducted in Ghana found that the majority of respondents (60%) reported washing their hands regularly as a preventive measure against COVID-19 (Adu-Boahen et al., 2020). Similarly, a study conducted in Nigeria found that the majority of respondents (78.2%) reported using face masks as a preventive measure against COVID-19 (Eze et al., 2020). Inconsistencies were also observed between this study and previous literature. For example, a study conducted in South Africa found that only 15.2% of respondents reported avoiding public places as a preventive measure against COVID-19 (Naidoo & Ramlagan, 2020). This is significantly lower than the findings of this study, where 74% of respondents reported avoiding public places. Additionally, this study found that females engaged in less harmful activities than men did with respect to COVID-19 (OR = 0.323, p 0.001). Age and academic year were also shown to have a role in the

respondents' habits. Students aged 30 and over had a lower odds of engaging in negative behaviors than those aged 24 and under (OR = 0.631,  $p = 0.0083$ ), whereas students in their third year of college were more likely to engage in less positive activities than those in their first year (OR = 3.362,  $p = 0.004$ ). This is consistent with studies conducted in other African countries such as Ethiopia and Sudan, which found that age and gender were significant predictors of preventive practices (Alemayehu et al., 2020; Babiker et al., 2020). Previous studies and our findings also demonstrate that there is a correlation between gender and several forms of prophylactic action taken in response to COVID-19 (Truong et al., 2019; Zhong et al., 2020; Khader et al., 2020). The findings show that first-year students are the most likely to abide by the COVID-19 standards. This agrees with the results of earlier studies that assessed the levels of COVID-19-related knowledge, attitude, and practice (KAP) across different populations (Truong et al., 2019; Hussain et al., 2020). Our results were encouraging because they demonstrate that the transmission of COVID-19 may be slowed by preventative measures including better hygiene, stronger behavioral commitment, and less social interaction. These results are in line with a survey of college students in China, which found that 57.5% of them and 40.7% of students using social media saw these platforms as reliable sources for learning new information. Zhong et al. 2020 discovered that 75% and 70% of students who participated in the study had a positive attitude toward the COVID-19 epidemic, respectively, and that these findings were consistent with previous studies in which participants had generally positive attitudes toward the disease (Truong et al. 2019; Khan et al. 2020; Al Nsour et al. 2020). In general, the study provides valuable insights into the preventive measures practiced by Students in technical institutions in Kakamega County, Kenya, and how they compare with those of other African countries. However, further research is needed to gain a

more comprehensive understanding of the factors that influence preventive practices among Students in technical institutions in Kenya and other African countries.

## CHAPTER SIX

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### **6.0 Introduction**

Here, we presented a synthesis of the results discussed in the previous chapter. Findings were summarized in light of the study's aims. In line with the results, suggestions were made on how the information gained from this study may be used to various areas of the field and future studies. Also included is commentary on the study's merits and caveats.

#### **6.1 Summary of findings**

The purpose of this study was to determine the knowledge, attitude and practice of COVID-19 pandemic containment measures among Students in technical institutions in Kakamega County, Kenya. A summary of the findings is presented based on the research objectives of the study.

##### **6.1.1 Knowledge on COVID-19 containment measures**

The primary objective of the study was to assess student understanding of strategies for preventing the spread of COVID-19. Over half of the respondents had adequate knowledge, and just under half had excellent knowledge, based on all the questions used to measure knowledge in this study. Overall, very few people were aware that COVID-19 is a virus that may cause respiratory illness. Moreover, less than half of respondents correctly identified bats as the presumed initial host for COVID-19. The majority of respondents who were asked about the methods they thought were used to spread COVID-19 mentioned respiratory droplets being spread through sneezing or coughing, touching one's face, eyes, nose, or mouth with contaminated hands, having direct contact with patients, or coming into contact with contaminated surfaces. More than a quarter of respondents reported experiencing COVID-19 symptoms such as fever

and dry cough, overall weariness, flu-like symptoms, and nasal congestion. Not many people listed the elderly or patients with chronic conditions as high-risk categories for COVID-19, and only over a quarter of them said that those with impaired immune systems were also at risk. It was formerly thought that consuming hot drinks and eating garlic, onions, and pickles might protect against COVID-19. The findings of the logistic regression analysis confirmed that students' levels of COVID-19 knowledge are substantially associated with their gender. Those between the ages of 25 and 29 and those older than 30 had a deeper understanding of COVID-19 than those between the ages of 24 and 24. Significant findings were also seen with increasing years of study; students in their second year or beyond were more likely to have strong knowledge compared to first-year students.

#### **6.1.2 Attitude towards COVID-19 containment measures**

The second inquiry aimed to uncover how students felt about efforts to rein in COVID-19. Most respondents were concerned that someone close to them might get COVID-19, but surprisingly few believed that everyone, regardless of socioeconomic class, should take precautions against the virus. Moreover, if they or a family member had signs of COVID19, half of the participants would seek help from the appropriate authorities. Most respondents didn't think getting COVID 19 would alter their worldview. When asked about the government's methods, the vast majority said they thought the first precautions the government took were adequate and carried out at the right time. In addition, a larger %age of people believed vaccination was the best way to avoid COVID 19. Respondents' attitudes were found to be usually upbeat after a compilation of attitude items. While over half of respondents were concerned about a close relative contracting COVID19, students with a high level of knowledge were shown to be far less likely to feel this way. A majority of these respondents agreed that

students with enough knowledge should also engage in preventive actions, rather than only those who are older or from higher-risk demographics. Participants with superior expertise were also more inclined to approach the appropriate authorities for guidance and support.

### **6.1.3 Practices of Covid-19 preventive measures**

The third aim was to find out whether and how often students really use Covid-19 precautions. Over half of respondents were found to adhere to at least six measures, including hand washing and other forms of cleanliness, mask use, avoiding crowded areas, and keeping a safe space between themselves and others. However, a sizable %age engaged in at least three harmful habits. Based on the results of a binary logistic regression analysis of the various factors influencing COVID-19-related practices, it was shown that females were less likely to engage in harmful behaviors than men. Age and academic year were also shown to have a role in the respondents' habits. Students aged 30 and over were less likely to engage in negative behaviors than those aged 24 and under, whereas students in their third year of school tended to engage in less positive activities than those in their first and second years of school.

### **6.2 Strengths and Limitations**

It's important to keep in mind that this research may have certain flaws. Most importantly, the study's subjects were all college students, therefore their answers may not be indicative of the public at large in Kenya. Self-selection bias, in which participants voluntarily choose to take part in a research, further reduces the study's generalizability. Furthermore, the obtained data was self-reported, therefore its accuracy and reliability rested on the honesty and remember abilities of the participants, making them vulnerable to recall bias. Furthermore, since a correlational design was adopted, causal conclusions could not be established because confounding variables

were not controlled for. Thus, this study's findings and interpretations are based only on correlations across variables rather than on any assumption of cause and effect. The study's strength lies in the fact that, unlike a small number of other research, it did not rely on a single question to quantify all of the end variables (the usage of confinement tactics). Different questions were utilized in the research to provide a more accurate picture of the result. The integrity of the practice variable's construct dependability would be jeopardized in this scenario. There were no other validated and standardized measures available in the literature that might have been used for the outcome variable.

### **6.3 Conclusion**

The majority of students we surveyed said they learned about COVID-19 from official Kenyan media briefs, which highlights the need for greater collaboration between the Ministry of Health and the media to roll out more effective tools to raise awareness of COVID-19 and the precautions that should be taken. With regards to routines, the great majority of individuals engaged in proactive and cautious routines in response to the COVID-19 epidemic. It was shown that females had much less bad habits than men when it comes to the COVID-19 epidemic, suggesting that positive practices are strongly linked to gender. In addition, the vast majority of respondents were concerned that a member of their own family would get the virus, and they felt that the first preventive measures made by the Kenyan government were adequate and carried out in a timely manner.

### **6.4 Recommendations**

Based on the findings of this research, the following are the recommended corrective measure which can contribute to effective COVID 19 containment measures.

1. Despite these caveats, more research is needed to assess people's understanding of COVID-19, as well as their behavior and perspective on the virus.



2. Future studies could attempt to survey a greater number of students, as well as those from other countries, in order to observe cultural similarities and differences. This in turn could help us identify how Kenyan students compare to those of other locations; maybe there are philosophical and or concrete training differences.
3. More researchers might benefit from a more rigorous measure of institutional practices of confinement if more researchers worked together to develop it.
4. There is a need for further naturalistic and randomized clinical trial studies that assess the effect of COVID 19 on student learning outcomes.
5. For future studies, it will be important to get feedback from educators as well as students. The results of such research in the future would add to the body of data supporting the use of confinement techniques.

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## APPENDICES

### **Appendix I: Informed consent**

**TITLE:** Knowledge, Attitude and Practice about Covid- 19 Pandemic Containment Measures among Students in technical institutions in Kakamega County, Kenya

#### **Introduction**

I am Eric Mukoche Wanyama, a second-year student at Masinde Muliro University of Science and Technology working for a Master of Science in Environmental Health Science. My study aims to examine TVET students' knowledge, attitudes, and practices about Covid- 19 pandemic containment measures in Kakamega County, Kenya.

#### **Purpose of the study**

The purpose of this study is strictly for academic purposes. This study is a requirement for the fulfillment of my Master of Science in Environmental Health Science

**Participant role:** The study is voluntary, and is strictly for academic purposes. There will be no money allowance or any compensation for participating in this study.

**Confidentiality:** All information collected will be confidential.

**Benefits:** There are no immediate gains, but future students will gain as they learn to combine theory and practice. Furthermore, this discovery will aid in informing and stipulating in policy the creative ways of aiding learning to students by high authorities, policy makers, program developers, curriculum designers, and other educational stakeholders.

**Risk:** There is no risk which is expected for participating in this study, though if the participant displays any risk will be cared according to the risk or injury

**Right withdraw:** You have the right to refuse to participate or withdraw from the study at any time without any penalty.

## Appendix II: Questionnaire

The researcher wishes to bring to attention of the respondents that any response given in the course of this research will only be used as an input for the research work. Confidentiality is assured to the respondents. The researcher is grateful to the respondents for the sacrifices to complete the questionnaires.

### Instruction

- i. Do not identify yourself by writing your name
- ii. Please complete all items in the questionnaire by ticking the appropriate response
- iii. Complete exercise by yourself, do not be influenced by your colleagues

<b>Sociodemographic</b>	
Gender	Male
	Female
Age	<=24 years
	25- 29 years
	>30 years
Marital status	Single
	Married
Level of study	certificate
	diploma
Year of study	First
	Second
	Third
Institution of study	Sigalagala
	Bukura
	Shamberere

<b>Students' knowledge about COVID-19</b>				
	<b>Statement</b>	<b>Yes: n (%)</b>	<b>No: n (%)</b>	<b>Don't know: n (%)</b>
1	COVID-19 is transmissible disease of viral origin that affects the lower and upper respiratory tract system?			
2	Bats are the genuine host of COVID-19 infections?			
3	Communication of COVID-19 is by playing and touching pets			
4	Communication of COVID-19 is through contact with infected individuals directly?			
5	Communication of COVID-19 is through respiratory droplets of infected persons via sneezing or coughing or laughing?			
6	Communication of COVID-19 is through direct contact with surfaces contaminated with the virus?			
7	Communication of COVID-19 is through touching the face, eyes, nose, and mouth with hands contaminated with the virus?			
8	Sore throat, Fever, cough, General fatigue, nasal congestion and difficulty in breathing are some of the manifestations of COVID-19			
9	All persons infected with the virus develops COVID-19 manifestations			
10	The elderly and individuals with long- lasting diseases (hypertension, diabetes) are at high risk of getting COVID-19 complications if infected.			
11	Immunocompromised individuals such as cancer patients on chemotherapy, chronic renal disease patients etc. are at high risk of developing COVID-19 complications if infected.			
12	Drinking hot beverages such as lemon and other personal hygiene precautions are the most favorable technique for preventing COVID-19 infection			
13	Correct wearing of surgical masks by healthy individuals is the most favorable technique for averting COVID-19 infection			
14	Cleaning of the nose and gargling of hot water is the most favorable technique for preventing COVID-19 infection			
15	Eating onions, pickles and garlic is the most favorable technique for preventing COVID-19 infection			
16	Correct use of antimicrobials is the most favorable technique for preventing COVID-19 infection			
17	COVID-19 vaccine is readily accessible in global markets			
18	COVID-19 disease is treatable			

<b>Students' attitudes toward COVID-19</b>				
	<b>Statement</b>	<b>Agree: n (%)</b>	<b>Don't agree: n (%)</b>	<b>Don't know: n (%)</b>
1	My chance of getting COVID-19 is high			
2	Beneficiaries to COVID-19 prevention measures are mainly the elderly and immunosuppressed individuals?			
3	The county government should provide assistance if a member in the community develops signs and symptoms of COVID-19 infection			
4	If an individual in the community is infected with the virus, my perception will change.			
5	Movement limitation of infected individuals will control the transmission and spread of COVID-19			
6	The county government authorities will succeed in containing the spread of COVID-19?			
7	The county governments have sufficient resources to manage confirmed and suspected cases of COVID-19			
8	The mitigation measures that were instituted by the Government of Kenya were adequate and successful?			
9	Do you think you are invulnerable from COVID-19?			
10	Severe cases of COVID-19, infection can cause Pneumonia, Acute respiratory distress syndrome and Death?			
11	Do you think COVID-19 is a conspiracy			
12	Vaccination provides the best method of COVID-19 prevention			
13	Symptomatic COVID-19 should self-quarantine to prevent transmission Practicing personal hygiene prevent transmission			
14	Individuals with COVID-19 have a high risk of developing severe cases			

<b>Students' practices with regard to COVID-19</b>			
	Statement	Often or more: <i>n</i> (%)	Rarely or less: <i>n</i> (%)
1	Following the outbreak of COVID -19 pandemic in Kenya, were you committed to washing your hands with soap and running water or using alcohol-based sanitizer on a regular basis? (Positive)		
2	Following the outbreak of COVID -19 pandemic in Kenya, did you practice the proper techniques of coughing and sneezing etiquette? (Positive)		
3	Following the outbreak of COVID -19 pandemic in Kenya, did you wear a face mask correctly as soon as you left the house? (Negative)		
4	Following the outbreak of COVID -19 pandemic in Kenya, did you avoid gatherings and public places? (Negative)		
5	Following the outbreak of COVID -19 pandemic in Kenya, did you reduce your presence in public places and adhered to MOH /WHO guidelines? (Positive)		
6	Following the outbreak of COVID -19 pandemic in Kenya, did you maintain a safe physical distance when in public places or gatherings? (Positive)		
7	Following the outbreak of COVID -19 pandemic in Kenya, did you have enough supplies of antipyretics and necessary medications at home? (Positive)		
8	Following the outbreak of COVID -19 pandemic in Kenya, did you have enough supplies of vitamins and nutritional supplements at home? (Positive)		

### Appendix III: Time frame

Activity	2021				2022				Comments
	Jan-Mar	Apr-Jul	Aug-Sep	Nov-Dec	Jan-Mar	Apr-Jul	Aug-Sep	Nov-Dec	
Presentation of Msc concept									Done
Proposal and data collection tool development									Done
Proposal defense at Departmental & School level									Done
Submission of proposal to MMUST Institutional Ethics Review Committee for Ethical approval and National Commission for Science, Technology and Innovation for Research Permit									Submitted and awaiting Feedback
Data Collection, cleaning and Analysis									

Write thesis and research articles for publication									
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## Appendix IV: MMUST ethical approval



### MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

Tel: 056-31375  
Fax: 056-30153  
E-mail: [ierc@mmust.ac.ke](mailto:ierc@mmust.ac.ke)  
Website: [www.mmust.ac.ke](http://www.mmust.ac.ke)

P. O. Box 190,  
50100,  
Kakamega,  
KENYA

#### Institutional Ethics and Review Committee (IERC)

REF: MMU/COR: 403012 Vol 6 (01)

Date: April 20<sup>th</sup>, 2022

To: Erick Wanyama Mukoche

Dear Mr,

**RE: Knowledge, Attitude and Practice about Covid-19 Pandemic Containment Measures among TVET Students in Kakamega County, Kenya.**

This is to inform you that the *Masinde Muliro University of Science and Technology Institutional Ethics and Review Committee (MMUST-IERC)* has reviewed and approved your above research proposal. Your application approval number is **MMUST/IERC/040/2022**. The approval covers for the period between *April 20<sup>th</sup>, 2022 to April 20<sup>th</sup>, 2023*.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including informed consents, study instruments, MTA will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by **MMUST-IERC**.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **MMUST-IERC** within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to **MMUST-IERC** within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to **MMUST-IERC**.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke> and also obtain other clearances needed.

Yours Sincerely,

A handwritten signature in blue ink, appearing to read 'Gordon Nguka'.


Prof. Gordon Nguka (PhD)  
Chairperson, Institutional Ethics and Review Committee


Copy to:

- The Secretary, National Bio-Ethics Committee
- Vice Chancellor
- DVC (PR&I)




Appendix V: NACOSTI approval

  
REPUBLIC OF KENYA  
National Commission for Science, Technology and Innovation

  
NATIONAL COMMISSION FOR  
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 870333 Date of Issue: 25/April/2022

**RESEARCH LICENSE**




**This is to Certify that Mr. Eric Mukoche Wanyama of Masinde Muliro University of Science and Technology, has been licensed to conduct research in Kakamega on the topic: KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT COVID-19 PANDEMIC CONTAINMENT MEASURES AMONG TVET STUDENTS IN KAKAMEGA COUNTY, KENYA for the period ending : 25/April/2023.**


License No: NACOSTI/P/22/17110

870333

Applicant Identification Number

  
Director General  
NATIONAL COMMISSION FOR  
SCIENCE, TECHNOLOGY &  
INNOVATION

Verification QR Code



**NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.**

## Appendix VI: Shamberere consent approval

5<sup>th</sup> May, 2022

Eric Wanyama Mukoche

Masinde Muliro University of Science and Technology (MMUST)

P.O BOX 190 - 50100  
Kakamega, Kenya

Tel: 0722498811

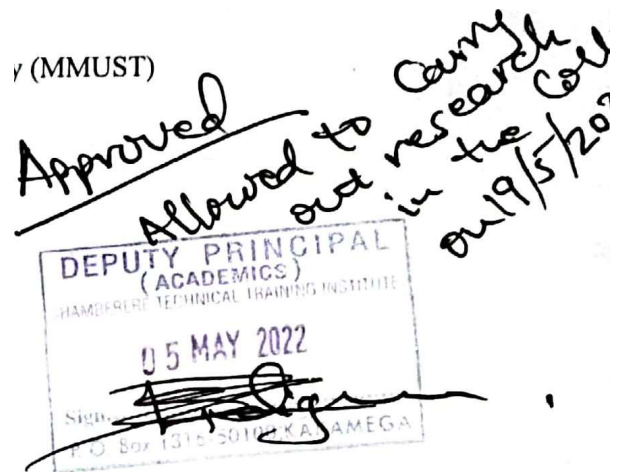
To:

The, Principal

Shamberere Technical Training  
Institute

P.O. Box 1316- 50100,

Kakamega,



### REF: CONSENT FOR DATA COLLECTION AND PARTICIPATION

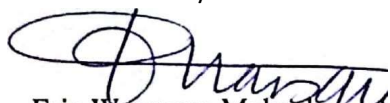
I am Wanyama Eric, Registration number HPH/G/01-54115/2019, a master of public health student at Masinde Muliro University of Science and Technology. I am conducting a study entitled 'Knowledge, Attitude and Practice about covid-19 pandemic containment measures among TVET students in Kakamega County, Kenya

I have chosen your institution as it meets the scope of this study. The information obtained from your institution will be treated with confidentiality.

I look forward to your assistance

Attached are approvals from various departments

Yours faithfully

  
Eric Wanyama Mukoche

## Appendix VII: Sigalagala consent approval

5<sup>th</sup> May, 2022

Eric Wanyama Mukoche

Masinde Muliro University of Science and Technology (MMUST)

P.O BOX 190 – 50100

Kakamega, Kenya

Tel: 0722498811

To: The, Principal

Sigalagala National Polytechnic

P.O Box 2966 – 50100,

Kakamega

### REF: CONSENT FOR DATA COLLECTION AND PARTICIPATION

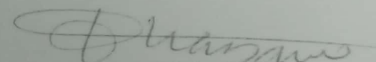
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I have chosen your institution as it meets the scope of this study. The information obtained from your institution will be treated with confidentiality.

I look forward to your assistance

Attached are approvals from various departments

Yours faithfully



Eric Wanyama Mukoche

HPH/G/01-54115/2019

