ASSOCIATION BETWEEN NORMATIVE BEHAVIOR, ACCEPTANCE, AND ADHERENCE TO PUBLIC HEALTH MEASURES DURING COVID-19 PANDEMIC IN MOMBASA COUNTY, KENYA

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DECLARATION

I declare that this proposal is my original work and has not been presented in any other university for consideration of any certification. This research proposal has been complemented by referenced sources duly acknowledged. Where text, data (including spoken words), graphics, pictures or tables have been borrowed from other sources, including the internet, these are specifically accredited, and references cited using current APA system and in accordance with anti-plagiarism regulations.

Signature  Date8th of July 2023

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This proposal has been submitted for appraisal with my approval as University Supervisor.

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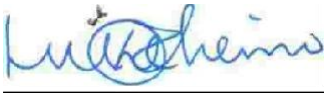
Signature  Date 9th of July 2023

Dr. Habil Otanga 

Signature: Date: 9th of July 2023

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ABBREVIATIONS AND ACRONYMS

CDC: Centre for Disease Control

COVID-19 disease: Corona Virus Disease -19

IDI: In-depth Interview

IT: Information Technology

KAP: Knowledge, Attitude, and Practice

KPHC: Kenya Population and Housing Census

MoH: Ministry of Health

M: Mean

NPI-Non: Pharmaceuticals Interventions

ODK Tool: Open Data Kit Tool

OECD: Organization for Economic Cooperation and Development

SD: Social Distancing

SD: Standard Deviation

TPB: Theory of Planned Behavior

WHO: World Health Organization

ABSTRACT

In responding to emerging pandemics, it is essential to factor in the normative behavior of community members who are the targeted actors for the government's adoption of any public health policies. The acceptance describes the association between normative behavior, acceptance, and adherence to strategies put in place by the government to combat COVID-19 With the application of the planned behavior and rational choice-exchange theory, the descriptive study enhanced our understanding of these theories by seeking: To establish the extent to which normative behavior is associated with acceptance of public health measures for controlling the spread of COVID-19: To determine the nature of the association between normative behavior and adherence to public health measures for controlling COVID-19 in Mombasa County: To establish the association between acceptance and adherence for controlling COVID-19 pandemic regarding normative behavior in Mombasa County. A survey was used to collect details, and a discussion guide was designed based on the variables. The findings indicates that respondents with the attitude category of normative behavior were 10.52% less likely to accept public health measures while those with the perceived controlled behaviour were 9.05% less likely to accept public health measures compared to those subjective normative behaviour. The findings also indicated that respondents with the attitude normative behaviour were 9.74% less likely to adhere to public health measures while those with the perceived contolled behaviour were 8.06% less likely to adhere to public health measures compared to those with the subjective normative behaviour. The research findings enhance our understanding of how public policy can be developed and influenced by normative behavior in society in response to current and future pandemics.

CHAPTER ONE

INTRODUCTION AND CONCEPTUALIZATION OF THE STUDY

1.0. Introduction

This segment examined the background of the research, which introduced research concern, highlighting various normative behaviors towards conforming to ministry of health directives to contain the pandemic. The study presented the statement of the problem, aim, goals, research queries, unsubstantiated theory, rationale and importance of the survey, scope, limitations, and delimitations followed by assumptions. It also contained definitions of terms that were applied in the survey.

1.1. Background to the study

COVID-19 disease was declared a global health emergency on 30th January 2020 (WHO, 2020) and a pandemic on 12th March the same year. The global pandemic created a level of uncertainty among the citizens worldwide by adopting the new norms (facial mask, hand sanitization, social distancing and current vaccination against the disease). The new norm is still a significant challenge which poses practical dilemmas among African populations. This has caused the invocation of norms, i.e., new normative behavior.

Normative behavior is defined as behavior resulting from norm invocation. Based on theory of planned behaviour, three components are used to define normative behaviors and have been highlighted as: Attitude, subjective norm, and perceived contolled behavour to set norms by Ajzen (1985). Normative behavior makes both negative and positive behavior more acceptable and highly practiced. For example, observing the people around smoking makes it more acceptable and prevalent (Erin et al., 2009).

The acceptance or rejection of new norms also traces back to normative behavior. Cultural and social norms regarding health behaviors may lead to either accepting or rejecting COVID-19 public health prevention policies. Rural areas are more likely to reject the policies being implemented or measures being taken to prevent disease. The urban environments are more inclined to accept and adhere to measures put across to prevent the disease. This is due to the differences in economic status and literacy level between urban and remote areas (Meit et al., 2014).

Normative behavior triggers adherence: familiar in adherence to COVID-19 noticeable and repetitive public health recommendations for the public. Observable and compatible social norms being a likely predictor of adherence, the absence of the same may be a reason for non-adherence. People are more inclined to adhere to recommended behavior when they observe actions and less likely if they notice others not doing it (Cialidni & Goldstein, 2004). African culture which encourages socialization has been highly challenged by some COVID-19 public health measures, including maintaining social distance, wearing face masks in social gatherings, and introducing quarantine and isolation for suspected and sick clients. With the enforcement of the public health measures and loss of sustainable livelihood support, most have perceived the infection to be of lower health risk and deny the complications arising from the disease (Ditto & Lopez, 1992; Riet & Ruiter, 2011).

In March 2020, many European countries suffered an acceleration in community transmission of the COVID-19 disease, with Africans feared to be more vulnerable to the pandemic due to poor and weak health care systems. However, Africa has not yet witnessed increased rates of sickness and deaths in comparison to many European nations, with an assumption of it having a younger generation and a hot-to-warm environment which are considered an unfavorable medium to the

spread of the virus. Such assumption have hence painted the picture of a lesser form of attack, which has turned people away from the notion that the COVID-19 disease exists within Africa and, more specifically, in Kenya. As a repercussion of the perception of low spread, the community is seen resisting and flouting public health infection prevention and control measures. This led to the acceleration of the second wave during the period from July to October 2020 in African countries, including Kenya (Xinhua, 2020). There has been concern among health care professionals given the acceleration of community infection in which the actual magnitude of the pandemic has not been indeed presented, and this is linked with low testing due to insufficient supply of the test kits and the low reporting of Asymptomatic and mild cases by the community to health authorities (Ebba & Jorge, 2020).

Social norms and expectations are shifting rapidly with the pandemic. In a study by Saint and Moscovitch (2021), three factors were hypothesized to increase social phobia related to wearing a mask: super-sensitivity to moral principles governing behavior, partiality in discerning collective and psychological facial expressions, as well a tendency for self-concealment as a way of security conduct. The study showed that people with social phobia wore masks and were more likely to be affected by how they perceived social morals and beliefs, which may or may not be in tandem with public-health directives: this can differ broadly, regionally as well as contextually. It was also noted that masks could play the role of personal covering as a way of helping people with social phobia conceal their own discerned imperfections. Consequently, the preference to hide may lead them to wear masks more than they wish to prevent the infection.

A cross-sectional online study among 683 people conducted in Ethiopia by Yehualashet et al. (2021) using a belief model showed that 44.1% compliance level with public health measures, key

determinants that affected the compliance were self-efficacy, anticipated hindrance, and vulnerability.

Communities within Mombasa define their symbolic interaction through a handshake, hugging, visiting each other's homes, and gathering for weddings and funerals. These societal interactions build upon a positive experience which reflects a sign of love, commitment, and happiness. However, this symbolic meaning changed with the emergence of the pandemic in Kenya. The action of community members is now prescribed by the need to accept and adhere to public health measures that attach a new meaning to societal interaction. Individuals' identities are shaped by experiences and the influence of others outside the internal spheres; as such, the meaning of symbolic interaction has changed with time, and people's actions in society are viewed at the micro-level stage. Many communities in Mombasa live below the poverty line, with the poverty index at 37.6% (World Atlas Data, 2006). Many households live within the confines of one room, i.e., living in houses of multiple occupancies will most likely result in non-adherence to the public health measures, whether intentionally or not, because the cost attached to adherence to public health guidelines outweighs the benefit. This is backed by a study conducted in the UK by Hills and Eraso (2021), who found that lack of compliance to all social distancing (SD) rules had a stronger relationship with susceptibility to COVID-19 and power over social distancing.

In contrast, premeditated non-adherence had a stronger relationship with intention and anti-social psychological factors. Therefore, embracing and conforMing health guidelines aimed at the public to control the epidemic can be explained in terms of costs, rewards, and exchanges. The behavior of individuals can be influenced by the perceived Value of the rewards or the costs. Thus, people make choices by weighing the costs and benefits of possible action (be it adherence to quarantine or isolation, hand washing or putting on face masks, getting vaccinated, or maintaining social

distance) by maximizing their gain. Accepting and adhering to public health measures are driven by a person's desires and motivated by personal goals. Every action is calculated based on costs and benefits, and one chooses the best outcome for themselves. Recent literature has explored the knowledge, attitudes, and perception toward COVID-19 public health measures.

As a way of expanding knowledge in this area, this study proposes to investigate the association between normative behavior, acceptance, and adherence to COVID-19 public health measures among communities in Mombasa.

1.2. Statement of the Problem

People are inclined to accept and adhere to recommended behavior by observing others' actions and less inclined to observe others not doing it (Cialidni & Goldstein, 2004). Further, human action is attached to the object's meaning; the more we get rewards, the less likely the Value attached to the object. Regarding COVID-19 management, the more restrictive measures enforced by the government, the more people become reluctant, thus increasing cross-community infection (VOA, 2021). From March to November 2020, communities in Kenya experienced social-economic hardships that compounded economic hardships prior to the pandemic. These stringent measures having a negative reward forced many to flout the public health rules leading to the resurgence of the third wave from March to May 2021 in Kenya. We also have minimal spread and deaths following earlier restrictive measures introduced, which may be partly explained by limited testing (Klok et al., 2020). The more people are reluctant; the more these regulations become less popular and less adhered to or accepted. Consequently, there is assurgency of a new variant that poses a great challenge to the scientist, the currently weak government health care systems, family ties, and local and global bilateral relations. In this paper, I proposed to find out how normative behavior

relates to COVID-19 management, building on the theory of planned behavior and rational choice–exchange theory.

1.3 Purpose of the research

To explore the association between normative behaviors, acceptance, and adherence to COVID-19 disease control guidelines among communities in Mombasa.

1.4 Objectives of the research

1. To establish the extent to which normative behavior is associated with acceptance of public health measures for controlling COVID-19 in Mombasa County.
2. To determine the nature of the association between normative behaviors and adherence to public health measures for controlling COVID-19 in Mombasa County.
3. To establish the association between acceptance and adherence to Ministry of Health guidelines aimed at the public to control the COVID-19 pandemic regarding normative behavior in Mombasa County.

1.5 Research Questions

1. To what extent is normative behavior associated with accepting public health measures for controlling the COVID-19 pandemic in Mombasa County?
2. In what way is normative behavior associated with adherence to public health measures for controlling the COVID-19 pandemic in Mombasa County?
3. What is the association between acceptance and adherence to public health measures for controlling the COVID-19 pandemic regarding normative behavior in Mombasa County?

1.6 Hypotheses

1. Normative behavior does not significantly affect acceptance of public health guidelines during COVID-19 in Mombasa County.
2. Normative behavior is not significantly associated with adherence to public health guidelines during COVID-19 in Mombasa County.
3. There is no significant relationship between acceptance and adherence to public health strategies during COVID-19 in Mombasa County.

1.7 Justification

Understanding community normative behavior was crucial in designing and implementing public health policies and guidelines. People have 'lived experiences which shape their way of thinking and practice. This study build on the theory of planned behavior to highlight the human beliefs influencing acceptance as well as the ability to adhere to public health strategies, beliefs about the consequences of adherence to the public health strategies, and beliefs around the capability of people to accept and adhere to the set public health guidelines during COVID-19 pandemic.

The research's justification was based on a better understanding of why certain groups will refuse scientifically supported policies during the COVID-19 pandemic. While current data contains information about behavioral responses during health emergencies, the unprecedented scale of the COVID-19 pandemic behavior in the individual household needs to be understood and explained from the theory of planned behavior as well as rational-social exchange theory.

1.8. Significance

In the context of this un-matched cross-cutting crisis that has affected health, society, and economy concerning COVID-19, where Kenya and the entire globe need to adapt to emerging, the rapid

revolution of public health policies has multiplied, understanding the factors that determine acceptance and adherence at all stages of the pandemic, as well as an arm of policy 'stringency' in Kenya and the entire world, is essential for constructive in policy planning, communication, and execution. At the household level, the research will aid in understanding the dynamics that cause barriers to demand creation for acceptance and adherence to public health measures for COVID-19 infection.

1.9. Scope

This study was conducted in Mombasa County in the following Sub –Counties: Mvita, Jomvu, Changamwe, and Kisauni. The scope of this study is limited to establishing an association between normative behavior, acceptance, and adherence to COVID-19 among communities in Mombasa.

Normative behavior was examined in the forms of subjective norm, attitude towards behavior, and perceived controlled behavior. Acceptance was studied in two forms: whether people have accepted these measures or not, thus acceptable and not acceptable. Adherence was examined in terms of whether people adhere to the public health measures during COVID-19 or not, thus adherence and non-adherence.

Adherence was defined as following the guidelines presented by the World Health Organisaion adopted by the national government and cascaded to the county government. This was measured by showing partcicipants followed such rules and measures as recommended. At the same time, the research showed the contrast between adherence and acceptance. The difference is that acceptance is agreing with the basic guidelines and measures, thus participating and supporting the policies without reward or coercion. The issue of acceptance is essential because while a sizable percentage of people adhere to general guidelines, the research suggests that a portion of the target group does not undertake such measures at home or other social gatherings. This would suggest

that they follow government measures to avoid inconvenience and lack of access to certain services. However, they still do not accept the information and precautionary measures presented by the global medical and scientific community.

1.10 Limitation and Delimitation

This study was time consuming thus 15 research assistant were recruited to fast track the data collection. Assuming 32% non response rate, a sample size of 510, this estimate was far exceeded by the current sample size (384). Selection bias and recall bias was acknowledge, because the respondents were household heads. Therefore, validating the information was wildly complex when households exaggerate their situations. The degree of accuracy heavily relied upon participants' ability or willingness to remember their behaviors, which might lead to underreporting or over-reporting. This was a descriptive study that did not establish any causal inferences. Furthermore, since this was a face to face interview convience sampling may have resulted in sampling biasness. It will be useful to conduct this study in the future targeting individuals within the household and not necessarily household heads.

The selected study area had benefitted from previously implemented public health measures interventions for COVID-19, conducted in July-December 2020 by a community-based organization in Mombasa, through WHO funding. The data was collected on real time shortening the analysis process.

1.11. Assumptions

The study assumed that normative behavior affects people's acceptance and adherence to public health measures during COVID-19 infection in Mombasa County. This meant that people accept

and adhere to wearing masks, maintain social distancing, hand sanitizing and vaccination because they see others do the same in public places.

1.12. Operational definition of the terms

Attitude towards the behavior: the way a person perceives the preventive behavior.

Perceived controlled behavior: how will people benefit from this action (cost-benefit analysis) towards public health measures?

Subjective norms: the community's standard practice towards preventive behavior (using face masks, hand washing, and maintaining social distance).

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Introduction

In this chapter analysis of previous relevant literature was presented. The main objective was to determine the association of normative behavior in acceptance and adherence to public health guidelines formulated to mitigate COVID-19 and determine the inventive behavioral determinants need to be adopted to champion support of the public towards COVID-19 preventive aligned measures. Further, it builds on planned behavior and rational choice–exchange theory to explain the behavior of Mombasa communities to stop the spread of COVID-19. Additionally, establish demographic influences on one's intentions to accept or adhere to strategies guiding the public to mitigate the spread of COVID-19 disease in Kenya. Summary of the literature reviewed and finally, a theoretical and conceptual framework was presented.

2.2. Association of normative behavior on acceptance of public health measures during COVID-19

COVID-19 globally affects respiratory system that largely depends on public health measures for control. Normative behavior contributes to controlling and flattening the COVID-19 pandemic curve in the community in the early stages of the infection. In countries where norms and rules run concurrently, the containment measure of the disease has been successful with less sporadic new variants example, in China and New Zealand. Recent studies explore the association of normative behavior with the acceptance of public health measures. For instance, Desalegn et al. (2021) conducted a survey in Ethiopia among 839 participants to gauge attitudes, knowledge, and practices of Corona Virus Disease. The findings showed that the flow of information from social

media and the government proved effective, as witnessed by the majority of the participant's ability to cite measures to prevent symptoms as well as signs and the route for infection of SARS-CoV-2. However, attitude and knowledge were not a determinant of application. A study conducted by Otanga (2021) among 216 university students concluded that attitude about social interaction was influenced by age, the type of personality (extroversion), and perception of risk. This study, like Aldukhayel et al. (2020), shows higher risk perception among the oldest group and further highlights the role of macro factors, including media, in developing attitudes among the population (Igunza, 2020). Additionally, the findings point to a contradiction between attitudes and practices – that an individual can accept to act proactively despite inconsistent attitudes, maybe through violent enforcement of COVID-19 measures (Bearak & Ombuor, 2020). In another study conducted by Chiu et al. (2020) in Taiwan using its national epidemiological database, a retrospective national epidemiological surveillance study between 2016-2020 accessed the impact of MoH guidelines that include hand hygiene, wearing a mask, and keeping distance on Influenza, Entero-virus, and Pneumonia during the coronavirus epidemic they found a significant reduction of influenza cases, Entero-virus, and Pneumonia during the pandemic. Wearing masks, hand hygiene, and keeping distance can control COVID-19 and reduce other diseases affecting the respiratory system. Another study was conducted by Lazarus et al. (2021) using a sample population of 13,426 in 19 countries that determined the likelihood of acceptance and factors that determine uptake of a COVID-19 vaccine. 71.5% of the respondents were likely or somewhat willing to get inoculated to prevent COVID-19, and 48.1% responded and registered the willingness to undertake recommendations from their employers. The unprecedented compliance rate was 90% (in China) to below 55% (in Russia). Participants who reported having more trust in the Government provided information sources more inclined to take a vaccine and to put the advice

from their employers to use. Further, respondents of higher income were more willing to take as compared to those with a lower income. Male participants in the research were less predisposed compared to female participants in the uptake of vaccines overall or recommendation by their employers to get a vaccine, but this relationship was not strong.

Parents have a significant role in determining acceptance of COVID-19 vaccination. A study by Yigit et al. (2021) in Ankara City Hospital among 428 parents who evaluated COVID-19 vaccine refusals in parents revealed that 37.4% of parents were unwilling to get vaccinated using homemade COVID-19 vaccines for themselves and their offspring; conversely, 66.1% were not willing to receive foreign vaccines for themselves and their offspring. Generally, the percentage of respondents that preferred homemade COVID-19 vaccines for themselves and their offspring was significantly higher. Male participants were more willing to get vaccinated with vaccines from foreign countries than their female respondents. The ability to advance in education among parents resulted in a reduced preference for locally produced vaccines for themselves and their children. High anxiety levels among parents concerning COVID-19 infection were a predisposing factor in determining uptake of vaccines for themselves or their children, whether their origin was from within or outside the country. Some reasons for turning down vaccines include: being anxious about complications resulting from vaccines, ignorance concerning vaccines efficacy, and lack of trust/faith in foreign manufactured vaccines. Similar findings were reported by Solís Arce et al. (2021) among 44,260 individuals representing ten middle-income, low-income countries (LMICs) in Asia, Africa, South America, Russia (an upper-middle-income country), and the United States of America in an analysis of COVID-19 vaccine uptake and uncertainty revealed that receipt of vaccines in LMICs is based on the urge for individual safeguarding against COVID-19, the reason that was commonly cited for hesitant behavior in vaccine uptake was the concern about side

effects. The most relied upon source of guidance concerning COVID-19 vaccines are health workers. Study samples in Sierra Leon, Rwanda, and Burkina Faso indicate that women are less likely to receive the vaccine than men; however, there was a notably higher acceptance among those with less education. In Nigeria and India, participants under 25 years old are significantly less inclined to vaccinate.

2.3. Association of normative behavior on adherence to public health measures during COVID-19

Adherence to public health guidelines set by the government depends much on its citizen doing the right thing based on the social and cultural norms without the need for enforcement. The Government which have their rules and norms coincide like New Zealand, its people have a higher adherence to public health measures. However, in most countries, especially in Africa, adherence to public health measures has been a problem: as noted in Kenya as of 16th December 2021, the positivity rate of COVID-19 had shot above 10%, with three new omicron variants detected. (Flash report, Kenya 2021). As reiterated earlier in this literature, recent studies have documented that adherence to public health preventive measures is an efficient way to prevent COVID -19 from spreading. Azene et al. (2020) contends that adherence to COVID- 19 containment measures has been a significant issue that has witnessed much hesitancy across the board. Abeya et al. (2021) determined the degree of compliance to COVID-19 prevention guidelines and related factors among 2751 participants aged 25 years showed that: 91.6% possessed highest awareness, (58.4%) moderate extent of knowledge and 32% had a responsive attitude towards COVID -19 prevention guidelines. Additionally, at least 85% of the study participants adhered to not less than one COVID -19 prevention directive by the government. Generally, levels of adherence to the practice of COVID -19 prevention guidelines were deficient (8.3%). In Uganda a study by Amodan et

al.(2020), among 1726 respondents assessed the levels and factors that contribute to adherence and fulfillment according to COVID-19 protocols set by the government. Findings revealed that (29%) of men were adherent to all four measures (hand washing, wearing of face masks, sneezing, and coughing hygiene procedures was most likely practiced by Kampala City dwellers, as well as enlightenment with information on COVID-19 disseminated by health care workers or critical persons from the village. There was a notable reduction in the probability of adherence to all four measures among people who shared residence with siblings younger in age. There was an increased probability of adherence to all four guidelines among female and health care workers, while experience with violence at home was associated with lower satisfaction. Elnadi et al. (2021) conducted similar studies in Egypt and Nigeria to determine attitudes, perceptions, and knowledge of the COVID-19 pandemic. The findings indicate that most (68.9%) study respondents were satisfied with COVID-19 control measures: (96%) repoerted self-isolation and practiced social distancing, while (36%) adhered to all four regulations by health authorities. (62%) perceived the global guidelines to avert and contain the spread of Corona Virus Disease as satisfactory. However, (22%) of the participants felt the governments in their countries handled COVID-19 satisfactorily. Contrary to these research findings, Julia et al. (2021), reporting coughing hygiene, frequent hand washing, and wearing of face masks achieved adherence rates above (90%) in Mozambique.

In Iran, a similar study by Kakemam et al. (2020), reported good adherence where hand washing using soap and water yielded (95%), keeping away from crowded places (93%), use of other disinfectants (80%), and coughing as well as sneezing hygiene (76%) were practiced. Nguyen et al. l. (2020), conducted a similar study using a sample of 2175 Vietnamese, adherence levels were found to be high in regards to observing individual as well as collective prevention behavior –

recommended keeping a 1-meter distance, covering the face using a mask, observing coughing and sneezing cleanliness as well as wash hands regularly using soap and clean water.

2.4. Relationship between acceptance and adherence to public health measures during COVID-19

Since COVID -19 emerged, countries globally have adopted strategies to prevent it from spreading but how best the public promotes acceptance and adherence to these guidelines is unclear. Recent studies have explored how communities' social, behavioral, and contextual realities significantly reduce community transmission. A pane study by Bearth et al. (2021) among senior Swiss adults assessed their reaction to the pandemic uptake and compliance with public health procedures/guidelines. Survey findings indicate general uptake and compliance to public health guidelines being higher in senior citizens and better among people with prior health conditions such as cancer and type II diabetes. The long-term study analysis found that acceptance of the measures was positively correlated with increased social trust over time, while trivializing faith and myths about health affected older peoples' adherence to prevention guidelines. In a similar survey by Isabelle et al. (2021) in Belgium, the degree of compliance was generally high among participants based on perceived usefulness and implementation. However, a low degree of compliance, perception of risk, and knowledge concerning guidelines were noted in specific subcategories of the population. A survey by Indrayathi et al. (2021) in Indonesia reported that up to a third of participants' adherence supports these. The perception study participants held with health benefits following public health protocols, femininity, and pre-existing test history on COVID-19 were highly related to the ability to adhere to public health guidelines. Unsystematic trials have tested strategies to change social processes and improve vaccination uptake. Brewer et al. (2017), in a survey discovered that in order to boost vaccination uptake, interventions must

facilitate action (via primes, promptings, and reminders) and reduce obstacles (through logistics and a healthy lifestyle), these interventions must influence behavior (using sanctions, requirements, and incentives), psychological ideas can shape the design of structure rules to enable implementation directly. In a research carried out by Ahmed et al. (2021) among 4543 Somalis' the findings showed lower conformity guidelines by the government for public health but higher acceptance for COVID -19 vaccine, especially among those experiencing Flu-like symptoms and health care workers, while reduced willingness to be vaccinated among female.

2.5. Summary of Review of Related Literature Review

It was essential to focus on the social and behavioral aspects of people's lives as crucial approaches to containing COVID-19 public measures, especially social distancing, hand washing, wearing face masks, quarantine, and vaccination. These measures posed multiple challenges, among communities with strong cultural and social beliefs. Understaning the socio-demographic and psycho-social factors that motivate community acceptance and adherence to COVID-19 public health preventive measure is essential in shaping the current and future pandemic response.

2.6. Theoretical Framework

The study shall employ the Planned Behavior Theory (PBT), the Rational Choice and the Social Exchange Theory. The PBT is a conceptual framework that can be employed in order to understand social behavior in humans (Ajzen, 1985; 1991): As an addition to the reasoned action theory (RAT) (Fishbein & Ajzen 1975; Ajzen & Fishbein, 1980), the planned action behavior theory is an overall model of explaining and predicting behavior among multiple ranges of diverse kinds of behaviors.

In this study, we applied the use of TPB to help determine variables that foretell acceptance and adherence to measures that exist, as applied to studies among health care professionals (Kortteisto, Minna, Jorma, Taina, & Pekka, 2010), where intentions seem to be a valid proxy measure of behavior. Furthermore, the TPB was used in a study in Italy where TPB was used to explore conducive behavior in an environment- the moderator impact of COVID-19 beliefs; according to (Caterina, Camilla, & Sabrina, 2020) findings indicate that people who are more aware of the symbiotic relationship between the pandemic and climate change show both high intentionality and strength as well as pro-environment. Additionally, the TPB was used in a study in Southeast Europe conducted by Marija et al. (2015) in assessing the role of biased rules shaping the desire to buy green food; the theory availed two beneficial perceptions: what people perceive represents statistically predicts behavior towards green food.

The Rational Choice Theory (RCT) and the Social Exchange Theory (SET) were employed to complement the Planned Behavior Theory (TPB) in understanding the results of this research. The RCT was founded by Adam Smith, among the first economists who developed the basic general rules of the rational choice theory. This theory will have its applicability in helping to understand human behavior. The theory postulates that all actions are rationally made after putting into consideration costs and benefits: the benefit of companionship or undertaking must supersede the price for the undertaking to be done when the value of the benefit goes under the cost Value of the cost incurred, those involved will terminate the action or cut the relationship. It will use the resources available to get full benefits from the rewards. The rational choice theory demonstrates that people are in charge of their decisions. They make choices consciously and not because of tradition or environmental influence. They rationalize and consider by weighing the benefits and possible consequences George et al. (1950). The Social-Exchange Theory, founded by George

Homans (1961), postulates that social behavior results from an exchange process. It works on two principles, i.e., self-interest and interdependence, that two parties are interdependent in any social exchange; it works on the principle of maximizing benefit and minimizing costs to an individual and that people will engage in a behavior (profit) that meets their psychological and economic needs.

2.7. Conceptual Framework

The independent variables will be subjective norms, attitudes toward the behavior, and perceived controlled behavior. They were conceptualized to interact with intervening socio-demographic variables of age, gender, religion, education level, occupation, and household characteristics in predicting the outcome, that is, acceptance and adherence to strategies in response to COVID-19.

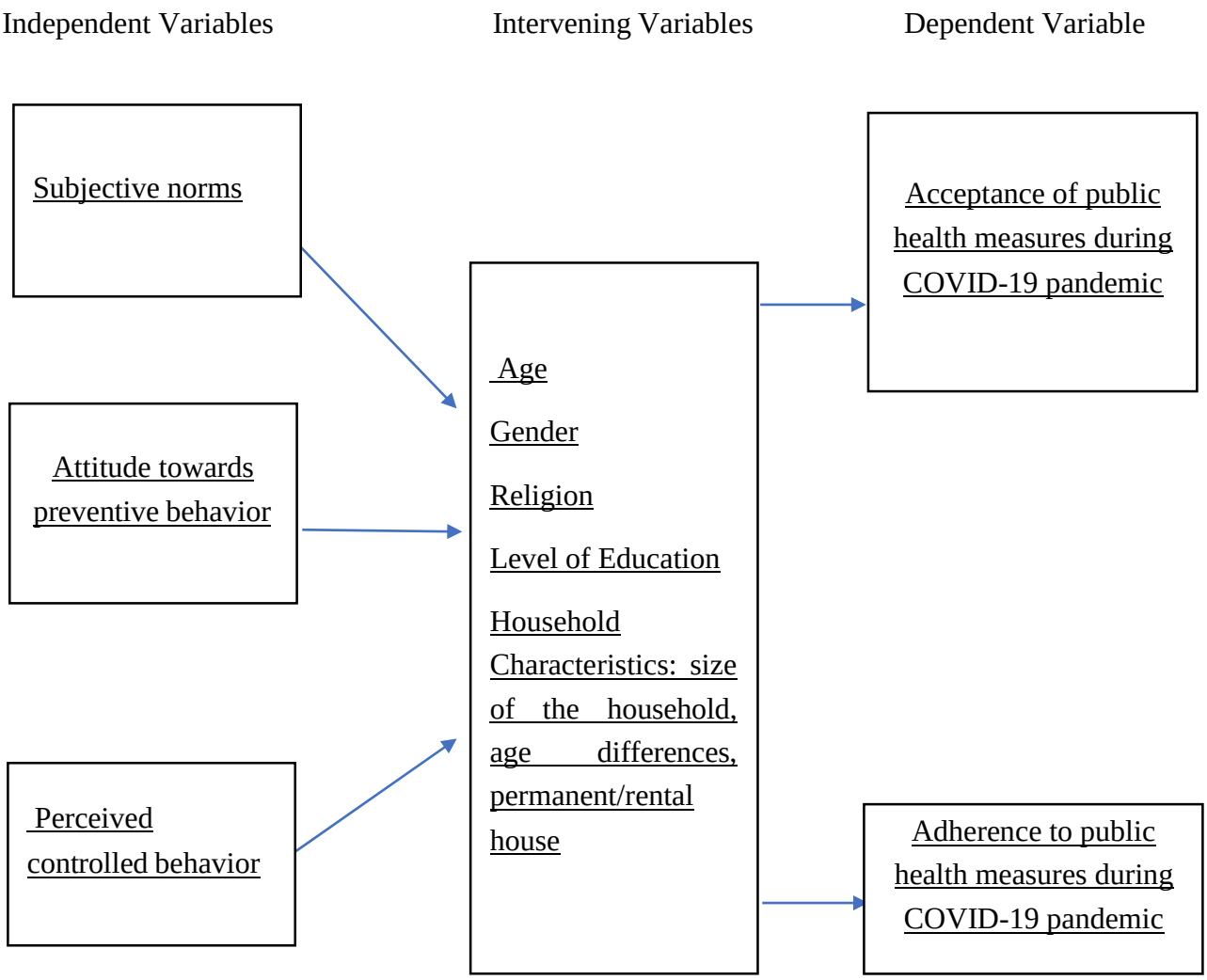

Figure 1: Conceptual Framework

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The methodology and design employed in the survey are detailed in this chapter. The study's design and methodology will be broken down into several sections, including the study's design, variables, study location, population targeted, sampling technique, sample size, study tools, data collection procedures, data interpretation, instrument reliability and validity, and ethical issues to consider.

3.2 Research Design

The research applied qualitative as well as quantitative methods. The aim was to determine the relationship between normative behaviors (IV) and acceptance(DV), and adherence (DV) to government protocols for controlling Corona Virus in Mombasa County. In order to determine the association between the IV and the DVs, a self-completion survey questionnaire and key informant interview schedule were used to collect quantitative and qualitative data.

3.3 Research Variables

3.3.1. Dependent Variables

The dependent variable in this study was acceptance and adherence to public health measures. These translate to people's willingness to practice the proper wearing of face masks, hand washing sanitization, vaccination, and maintaining a social distance that is essential in preventing community transmission of COVID-19 without enforcement.

3.3.2. Independent Variables

The independent variables in this research were:

- Subjective norms are the normal pre-COVID-19 behavior of individuals that have negative implications for compliance with COVID-19 measures.
- Attitudes towards preventive behavior; Individuals' attitudes towards practicing proper wearing of face masks, hand washing, sanitization, vaccination, and maintaining social distance.
- Perceived controlled behavior; Individuals' feelings of control towards practicing proper wearing of face masks, hand washing, sanitization, vaccination, and maintaining social distance.

3.3.3. Intervening Variables

The intervening variables of the study were age, religion, level of education, gender, occupation, and household characteristics.

3.4 Location of the Study

The research was conducted in 4 Mombasa County sub-counties, Mvita, Jomvu, Changamwe, and Kisauni Sub-counties. The County is located South East of the Coastal part of Kenya. Mombasa is located strategically and shares the border to the North with Kilifi County; South West the Mombasa borders Kwale County, and to the East, the county borders the Indian Ocean. The population density of Mombasa is 5,495 per square kilometer; it has a population of 1,208,333 and a total of 378,422 households (KPHC, 2020). The county is also a tourist attraction and has several recreational sites. According to the Ministry of Health statistics, the county was reported to take second place in terms of being affected by the pandemic in Kenya (MOH, 2020). Reports indicated that high numbers of cases were posed by multiple challenges, especially in the communities that follow strong cultural and social beliefs in the old town of Mombasa in Mvita Sub-County.

3.5 Target Population

This research targeted all adult households heads between the ages of 18 years to 59 years in Mombasa County as its population. The study targeted households within the four sub-counties selected within Mombasa County, with a total population of 227283. The study utilized information from 4 key community informants and two policy influencers.

3.6 Sample size

The study sample size was ascertained using the sample calculation method recommended by Fisher et al. 1998.

$$S = \frac{Z^2 * P * (1-P)}{(E)^2}$$

S= Sample Size of infinite population

Z= Z score

P=Population Size

CO=Confidence Interval 95%

E= Margin of Error: 5%

S= (1.96*1.96) *0.5*(1-0.5)/ (0.05) (0.005)S=384.16

Table 3. 1: Households in 4 sub-counties of Mombasa County under study

Sub-county	Number of households	Proportion of sample size
Changamwe	46614	79
Jomvu	53472	90
Kisauni	88202	149
Mvita	38995	66
Totals	227283	384

Source 2019 Kenya Population and Housing Census: Volume 1

Adjusted Sample Size of a population= Sample size of infinite population (S)/1+ [(S-1)/Population]

Adjusted S=384.16/1+ [384.16-1)/227283] which equals to 384

Therefore, the sample size for the study is 384 households.

The proportion of sample size per sub-county is derived from the number of households per sub-county divided by the total sample population per sample size.

3.7 Sampling procedure

3.7.1 Quantitative data

The study utilized a multistage sampling technique to achieve a county representative sample.

The first stage involved cluster sampling since we target households across a large geographical region, i.e., sub-counties from a total of 6 Sub-counties in Mombasa (Jomvu, Changamwe, Kisauni, and Mvita). Changamwe and Jomvu are industrial areas that connect the parts of Mombasa to the East and Central Africa, highly populated by a high-risk group, i.e., truck drivers.

Mvita sub-county was the epicenter of the pandemic in the county during the onset of the disease in April (Ministry of Health, 2020). A total lockdown was initiated in some parts of Mvita to curb the spread of the pandemic. Kisauni was selected because of the poverty level of the households within the sub-county, with the majority of the residents being affected by drug and substance use (NACADA, 2018). The second sampling stage involved listing all wards within the sampled sub-counties and randomly selecting sample wards from strata. Kisauni is divided into seven wards, Changamwe into five wards, Jomvu has three, and Mvita has six.

The third stage involved simple random sampling in addressing several variables where households are picked randomly from the stratum. The demographic variables will be our strata, a total of 384 households.

3.8 Research Instruments

3.8.1 Quantitative Data

The study utilized questionnaires (See Appendix 1) for quantitative data, which will be adopted from the Theory of Planned Behavior questionnaire (Hatabu et al., 2020) and (Ajzen, 2013), structured interviews for KIIs (See Appendix 2). The questionnaire was divided into seven parts. Part A collected information on the respondent's social demographics, such as gender, age, academic background, work experience, and religion. Part B collected household members' data, which includes the household size and ages of the youngest and oldest members within the household.

Part C and D examined the dependent variables: practice on acceptance of public health measures and practice on adherence to public measures. The variables had seven items and were measured using a 5-point Likert scale questionnaire with either 1. Disagree 2. Disagree, 3. The neutral point,

4. Agree 5. Totally agree. Those who disagreed/totally disagreed with the practice of acceptance of public health measures formed a non-acceptance of the measures, while those who agreed/Totally agreed formed acceptance of the measures. Those who disagreed/totally disagreed with the practice of adherence to public health measures were worded as non-adherence to the health measures, while those who agreed/totally agreed to the practice of adherence to public health measures were considered to have adherence to the measures.

Part E examined subjective norms, which represented the independent variables and had eight items that measured the belief that the household respondent approves and supports the health measures behavior on COVID-19. A 5- point Likert scale had statements regarding the respondent's behavior in practicing the health measures where 1. Totally Disagree, 2. Disagree, 3. The neutral point, 4. Agree, and 5. Totally agree. Those who disagreed/totally disagreed were categorized to have a negative belief about the measures, while those who agreed/totally agreed formed those with a positive belief towards the health measures.

Part F had an attitude towards preventive behavior, which examined the respondents' attitudes towards the practice of health measures on COVID-19. It had nine items measured using a 5- point Likert scale with 1= Totally Disagree, 2=Disagree, 3=Neutral point, 4=Agree, and 5=Totally Agree. The items evaluated the behavior of respondents towards the practice of the public health measures entailing the consideration of the outcomes of performing the behavior. Those who disagreed/totally disagreed were considered to have a negative attitude toward the public health measures, and those who agreed/Totally agreed were considered to have a positive attitude towards the practice of health measures.

Part G examined the perceived control behavior, which denoted the ease or difficulty of exhibiting the behavior in the practice of the health measures on COVID-19. Response choice questions were

recorded using a five-point Likert scale response set and coded as 1=Strongly Disagree, 2=Disagree, 3=Neutral point, 4=Agree, 5=Strongly Agree. Larger scores indicated Positive control behavior, while fewer scores indicated less positive control behavior towards public health measures on COVID-19. For instance, an item that measured this variable was 'Whether or not I adhere to public health measures regularly is under my discretion.

3.9 Data Collection Procedure

Approval was obtained from the National Commission for Science, Technology, and Innovation (NACOSTI) in the Ministry of Education; the researcher also received authorization from the Department of Health, Mombasa County. The researcher enlisted the support of three community guides to ensure the data was collected on time. Data was collected based on the respondent's reference language (Kiswahili or English). Data quality was enhanced by employing several measures, including training three research assistants who aided in collecting the information, pre-testing and refinement of study questionnaire done through close supervision of data collection by use of an online ODK questionnaire.

3.9.1 Quantitative data

The study utilized Kobo Collect version 1.30.1 by installing the app on the phone of respective data collectors. Kobo collect application was used to open the tool after uploading on respective phones. The research assistants team was guided to ensure they understood the process of accessing the blank forms and saving and submitting the finalized forms to the main server. Additionally, the data collectors were required to abide by the COVID -19 prevention strategies set by the government to ensure their safety and the safety of the respondents at all times. These measures include social distancing 2 meters apart, wearing a face mask, and using sanitizer for self and the respondents before any face-to-face interview. Study participants were made aware of what

the interview entails, and informed consent was required; declining to be interviewed will not have any repercussions for the participants. The supervisor was available to work with the team and was required to guide from the beginning to the final stage of the data collection process.

3.10Pilot study

The tool was first shared with the community guide to test if the questions and content flow aligned with the study's aims. A pilot study was carried out, and a total of 38 respondents for questionnaire and one for interview were utilized for the pretest exercise prior to the study period. The pretest of the study instruments was carried out on respondents who were different from the study participants. Mugenda and Mugenda (1999) recommended 10% to 50% of the total sample size for pretesting. Pretesting was carried out in all selected study sites, which will be marked to avoid reselecting the same households during the actual study period and further Minimize biasness. Analysis was done to establish the quality of data collected, and the inconsistencies, gaps, and overlaps were corrected before the beginning of the real research. The analysis of the pilot study showed that two items measuring practice of acceptance and adherence to public measures were Negatively reversed coded ("I have meals with non-family people at the same table" and "if I believe in my friends, I may not use any protection against COVID-19 when I am around them"). These items on the research data analysis were reversed-coded before the analysis began.

3.10.1 Validity

The relevant validity for this study was content validity to test the extent the data collected by the use of a certain method represents the content of a particular concept. In order to ensure the study instrument had satisfactory content validity, the quantitative study instruments were developed based on the study questions and objectives. Review by peers and university supervisors was

consistently done at the department to ascertain the content and construct validity of the tools used in the study. Golafshani (2003) suggested that the validity of the study tools

is a measure of the extent to which the tools measure what they are intended. The pretest data were also analyzed, and the correlation between the variables was calculated. A high degree of correlation between the variables will suggest sufficient validity of the tool. Correlation above 0.35 is recommended for validating a data collection tool (Taherdoost, 2016). In addition, validity was done through face validation by observing the content and seeing if they measure the true study constructs.

3.10.2 Reliability

Reliability shows the precision and accuracy of the measuring instrument. The study used Alpha by Cronbach to test the internal consistency of the study instruments. Cronbach's α is a statistic that shows the degree to which items in a measurement scale are related to other items. Below are the Cronbach's coefficient alpha formulae:

$$\alpha = \frac{N.\bar{C}}{\bar{V} + (N-1).\bar{C}}$$

N= represents number of items

C-bar is the total inter-item covariance among items

V-bar equals the total variance

Table 3. 2: Reliability Results

Variable	Number of items	Cronbach alpha Coefficient
Practice of acceptance of public health measures	7	0.7054

Practice of adherence to public health measures	7	0.7328
Subjective norms	8	0.7024
Attitude towards preventive behavior	9	0.8611
Perceived controlled behavior	4	0.7474

The reliability test was done by a single administration of 35 items entered into Stata 2013. The criterion for reliability indices is above 0.70, or all items correlated at 0.30. (Whitley, 2002, Robinson, 2009).

A coefficient scale ranges from 0 (depicting absence of internal consistency) to 1(presence of internal consistency). The analysis of the items reported an alpha of 0.92, which is above our threshold of 0.7, indicating the high reliability of the items in the measurement scale.

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3.11Data Analysis

Kobo Collect briefcase was used to extract information from the Kobo collect server excel sheets. The data will then be transferred to STATA 15 and SPSS V25.0 for data sorting, transformation, and analysis. For parts A and B of the questionnaire guide, descriptive statistics such as; frequency distributions depicted by tables and graphs, central tendencies in the form of means, and dispersions in the form of standard deviation were computed.

Part C, D, E, F, and G utilized the Likert scale; for instance, on a scale of 1-5, 1 stand for strongly disagree while five stands for strongly agree. Data analysis was conducted using the Likert scale

responses per item to help gather information concerning acceptance to practice of public health measures, adherence to the practice of public health measures, subjective norms, attitudes, and perceived control behavior.

Objective one and two was achieved using the chi-square test to explore associations between the independent variables (Normative behaviors) and dependent variables (Acceptance of public measures and adherence to public measures). Chi-square was more robust for the distribution of data, unlike other non-parametric statistics, as it does not require equality of variances among study groups (homoscedasticity). A significance level of 5% was used to test if the variables were statistically significant (p=0.05).

$\chi^2_{Statistic} = \sum \frac{(O - E)^2_i}{E_i}$ Where: O is the observed Value; Ei is the expected Value, and the chi-squared Value.

The hypothesis to be tested is given as follows:

H_O: There is no significant association between normative behaviors and acceptance of public measures and adherence to public measures; against

H_a: There is a significant association between normative behaviors, acceptance of public measures, and adherence to public measures.

The decision rule states that we reject the null hypothesis (H_O) if $\chi^2_{Statistic} \geq \chi^2_{Tabulated}$ and we conclude a significant association between the variables. The tabulated chi-square Value at (r-1) (c-1) degrees of freedom is read from statistical tables.

Objective three was achieved by fitting multinomial logistic regression models to establish the true significant predicting variables for the association between the independent and dependent variables of the survey. Kolmogorov-Smirnov test standard error was used to check for normality and multi-collinearity of the data, respectively. The significance level was fixed at 0.05(p=0.05). The multinomial model to be fitted will be:

$$ln[\frac{p(y=m)}{p(y=1)}] = \beta_0 + \beta_1 Age + \beta_2 Gender + \beta_3\, Re\, ligion + \beta_4 Water_{source} + \beta_5\, Pr\, o\, fession + \beta_6 Education + \beta_7 Attitude + \beta_8 Subjective_{norms} + \beta_9 PerceivedControl\_behaviour$$

3.12Ethical and Legal Considerations

The researcher initially submitted the complete study proposal to the University of Nairobi for the necessary approval. Upon approval, the researcher requested a letter of authorization from the Department of Psychology, University of Nairobi. The researcher requested authorization from National Commission for Science, Technology, and Innovation (NACOSTI) in the Ministry of Education and permission from the Department of Health, Mombasa County, to conduct the research. Informed consent was sought from the respondents. In addition to their consent, the researcher upholds the confidentiality of their responses: names of the respondants were not capture on the research instruments, and anonymity was maintained. Further, the researcher took proper security measures for data management.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents an overview of the research findings based on the data analysis. The data collection was primarily driven by the fundamental goal of exploring the association between normative behavior, acceptance, and adherence to COVID-19 disease control public health guidelines among communities in Mombasa. This was further broken down into three primary objectives of the study: establishing the extent to which normative behavior is associated with acceptance of public health measures for controlling COVID-19 disease in Mombasa County; determining the nature of the association between normative behavior and adherence to public health measures for controlling COVID-19 in Mombasa County; to establish the association between acceptance and adherence to Ministry of Health guidelines aimed at the public to control COVID-19 pandemic regarding normative behavior in Mombasa County. The findings presented in this chapter entail the analysis and interpretation of data as per the research objectives.

4.2 Response Rate

The research was conducted in 4 sub-counties of Mombasa: Mvita, Changamwe, Jomvu, and Kisauni. The stratum for Mvita was: Tudor, Majengo, and Old Town; for Changamwe: Changamwe and Kipevu; for Jomvu: Jomvu, Miritini, and Mikindani; while for Kisauni: Bamburi, Magogoni, Mjambere, Mtopanga, and Shanzu wards were selected. Kobo briefcase collect tool was used to administer the quantitative questionnaires to the 384 sampled population of households with the support of 15 research assistants. The response rate is indicated in Table 4.1.

Table 4. 1: Response Rate

Respondents	Expected Sample	Returned Sample	Percentage (%)
Changamwe	79	81	103%
Mvita	66	120	181%
Jomvu	90	132	147%
Kisauni	149	177	119%
Totals	**384**	**510**	**133%**

The response rate for the deployed questionnaire through the Online Data Kit tool was saturated at 133%. The data collectors were a wide range of enabling actors: community village elders to community health volunteers. Data collection was managed at the household levels where participants were willing to provide information to a data research assistant. Furthermore, the researcher took measures to recruit an extra five research assistants as a backup to overcome any shortfalls that may be experienced with reluctance to response within the households.

4.3 Demographic Distribution

The researcher conducted a demographic distribution of the respondents to determine the association between normative behavior, acceptance, and adherence to public health measures. Throughout this section, the gender of the household head, age, educational level, religious doctrine, profession, and demographic characteristics of household members, as well as the type of residence and water source responses, were measured.

4.3.1 Age of the Household Head

The aim was to determine the age distribution of the respondents. The average age was 42 years, with a minimum age of 18 and a maximum of 79 years. A categorical age variable was created for those below 30 years, those between 30 and 39 years, between 40 to 49 years, and those aged 50 and above. Figure 1 presents the results of the distribution on age.

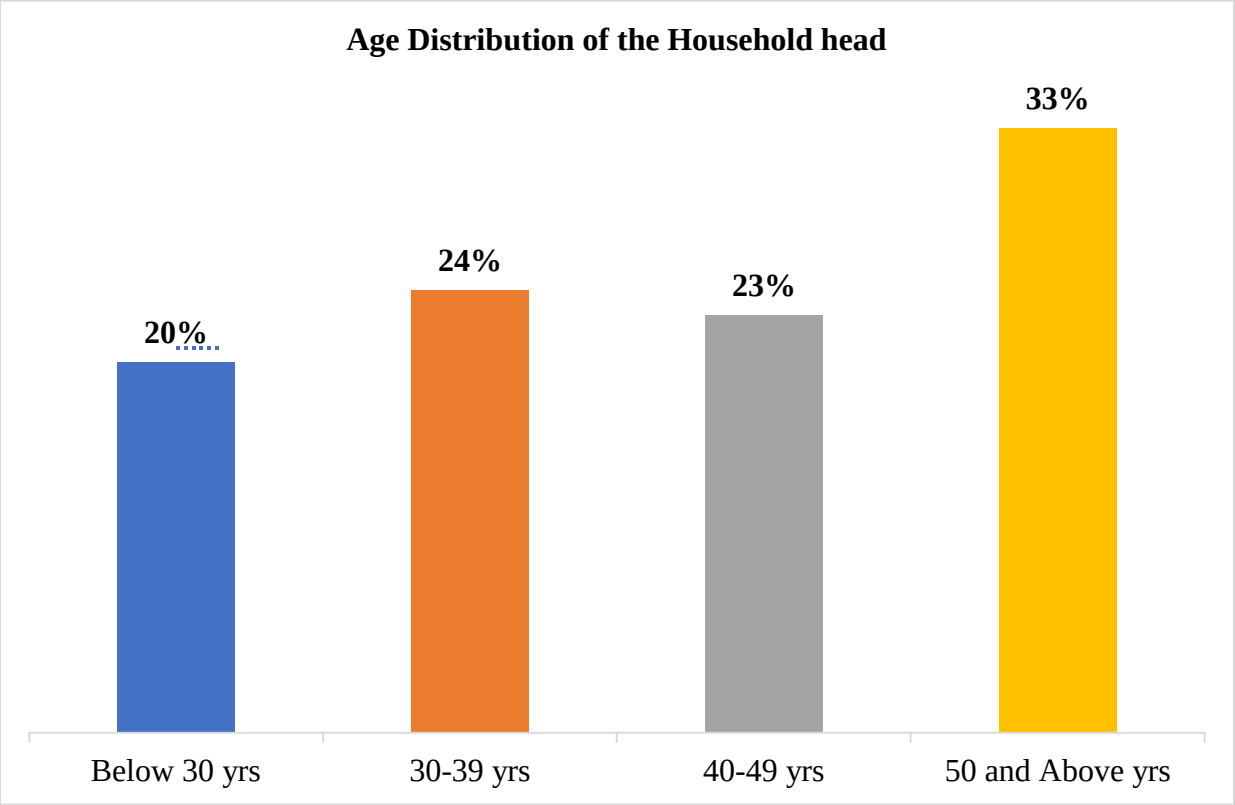

Figure 1: Age Distribution of the Household head

From Figure 1, 102(20%) of the household heads were below 30 years, 123(24%) of the household heads fell between the ages of 30-39 years, 117(23%) were between 40-49 years while 168(33%) were above 50 years. The majority of the household heads are aged above 50 years. This implies a faster pace of population aging; thus, their social and health system is challenging, and this population is faced with life transitions such as retirement, thus insufficient caretaker workforce.

4.3.2 Gender of the household heads

The heads of households were asked to indicate their gender. 57% of households were female-headed and 43% were male headed.

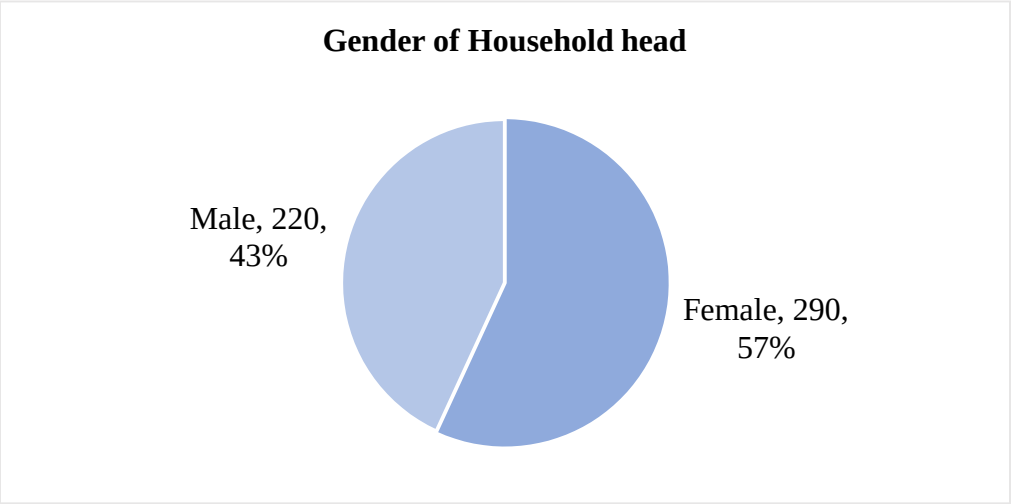

Figure 2: Gender Distribution of the Household head

Kisauni reported the highest proportion of households headed by females (72%) while Changamwe recorded the least (39%) as presented in Figure 2.

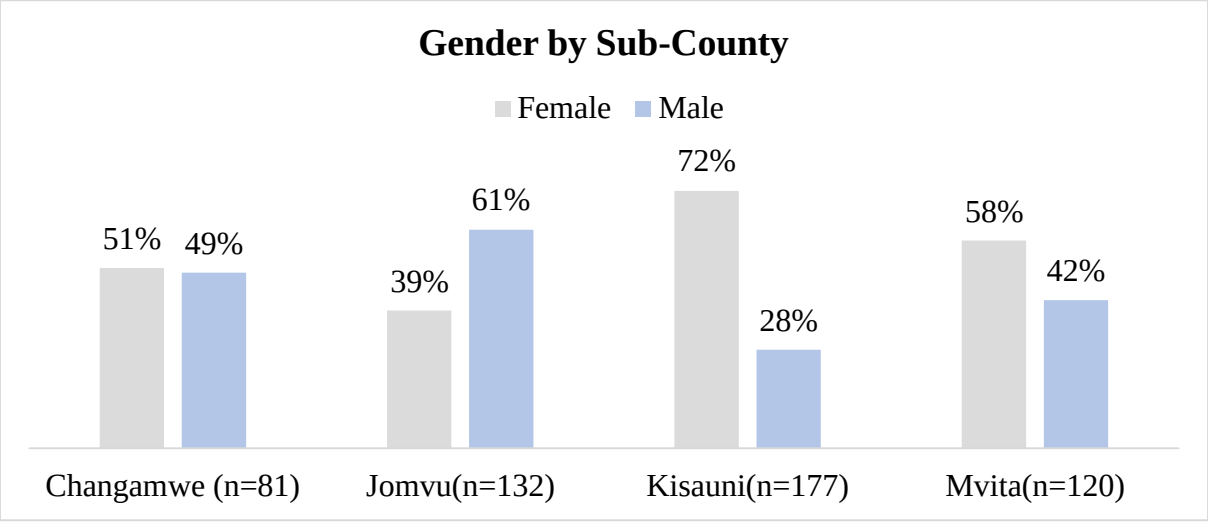

Figure 3:Gender Distribution of the Household head by Sub-County

4.3.3 Education level of the household heads

The household heads had a diverse level of education: Nursery level (3.3%), primary level (41.2%), secondary level (32.0%), college level (14.7%), and university (8.8%). The majority of the household heads were educated or above the primary level.

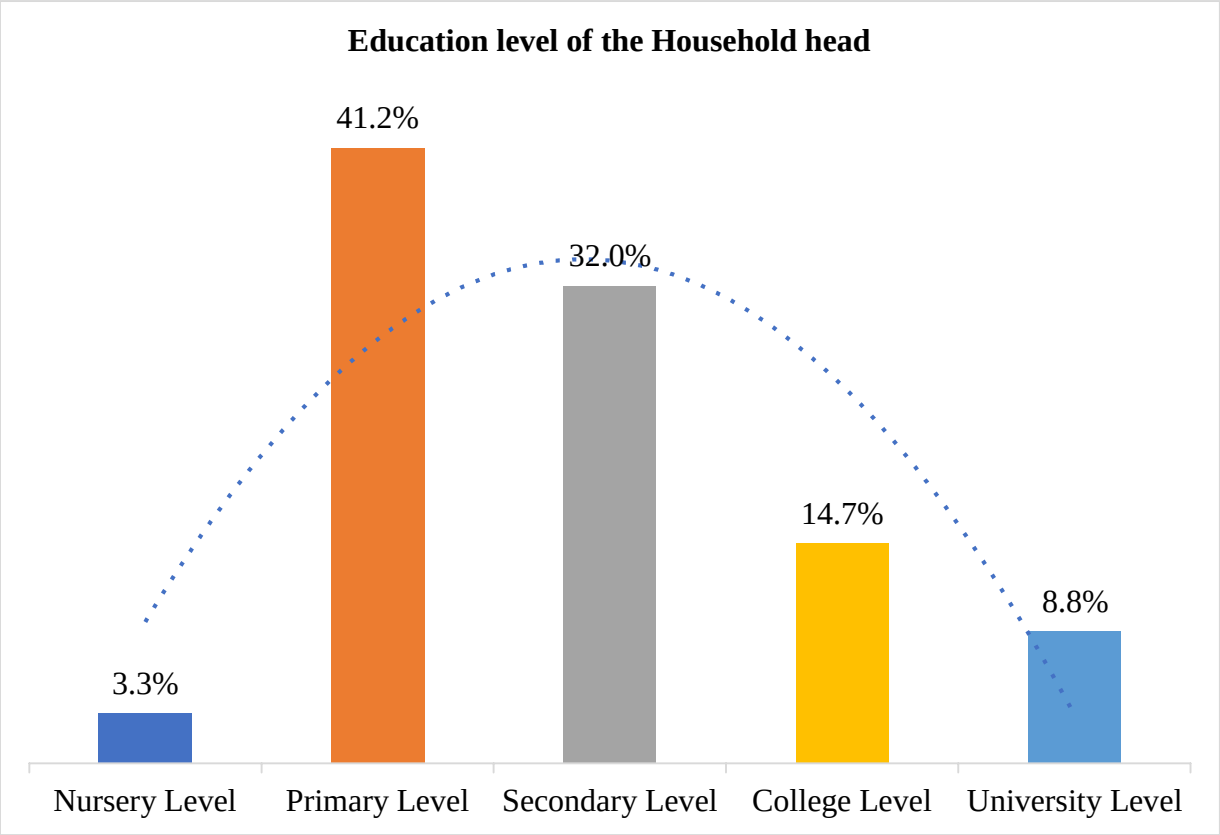

Figure 4: Education level of the Household head

Variation of education level by age group of the household heads shows that majority of the heads who are below 30 years of age (74%) attained secondary level of education and above, 62% for those who are between 30-39 years, 47% for those between 40-49 years of age and 46% for those who are 50 years and above. Level of education for the households heads decreases as age increases as shown in figure 5 below.

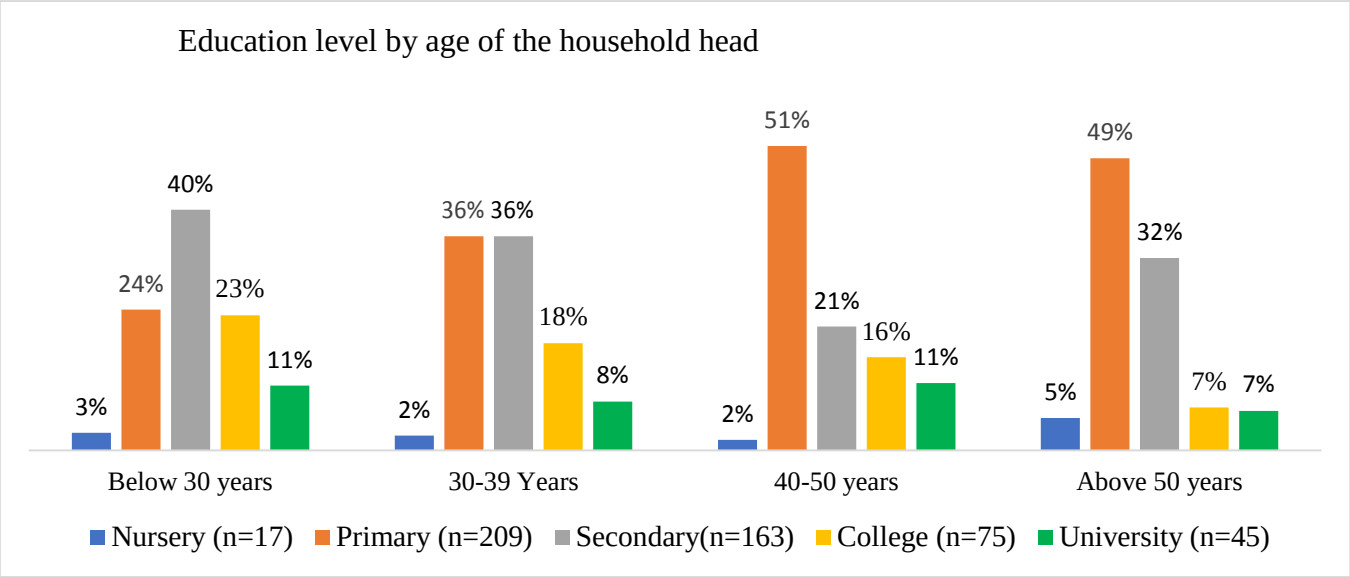

Figure 5: Level of education of household heads by age groupsThe parity of education level by the gender of the household head show that males are more educated that females. As shown in figure 6 below, the education level of female heads is concentrated on the primary level (51%) while that for male heads is on the secondary level (42%). Overall, only 46% of the female heads went through secondary level of education compared to 69% for their male counterparts.

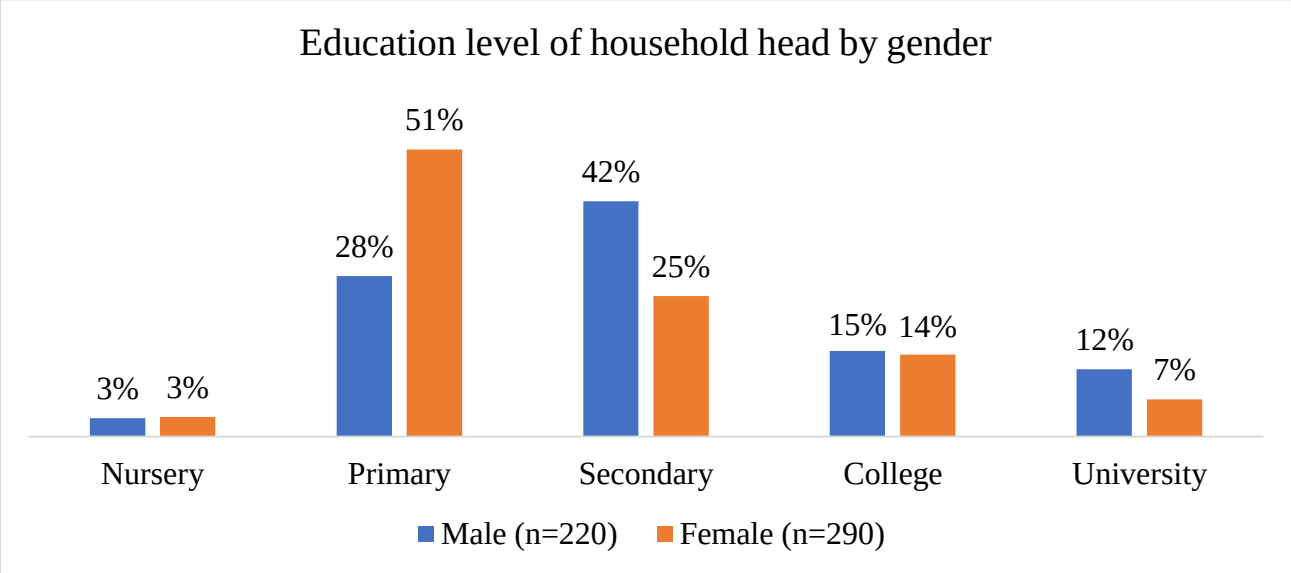

Figure 6: Chart showing Variation of education level of the household by the gender of the head

4.3.4 Religion of the household head

The researcher was interested in the professed practiced faith of the household heads. 61% (311) were Muslims, 38% (194) were Christians, and 1% (5) practiced Hinduism, as shown in Table 4.2. Religion played a major role in the practice of public health measures; with the spread of the new coronavirus, there is witnessed disruption of religious observances.

Table 4. 2: Religion of the Household Head

Religion	Respondents (N)	Percentage (%)
Muslims	311	61
Christians	194	38
Hindu	5	1
Total	510	100

As shown in figure 7 below, more Christians (71%) and Hindus (100%) are more educated than muslims (45%). Education level of those who practices islam is more concentrated on the primary level than other level of education whereas for Christians, majority attained secondary education.

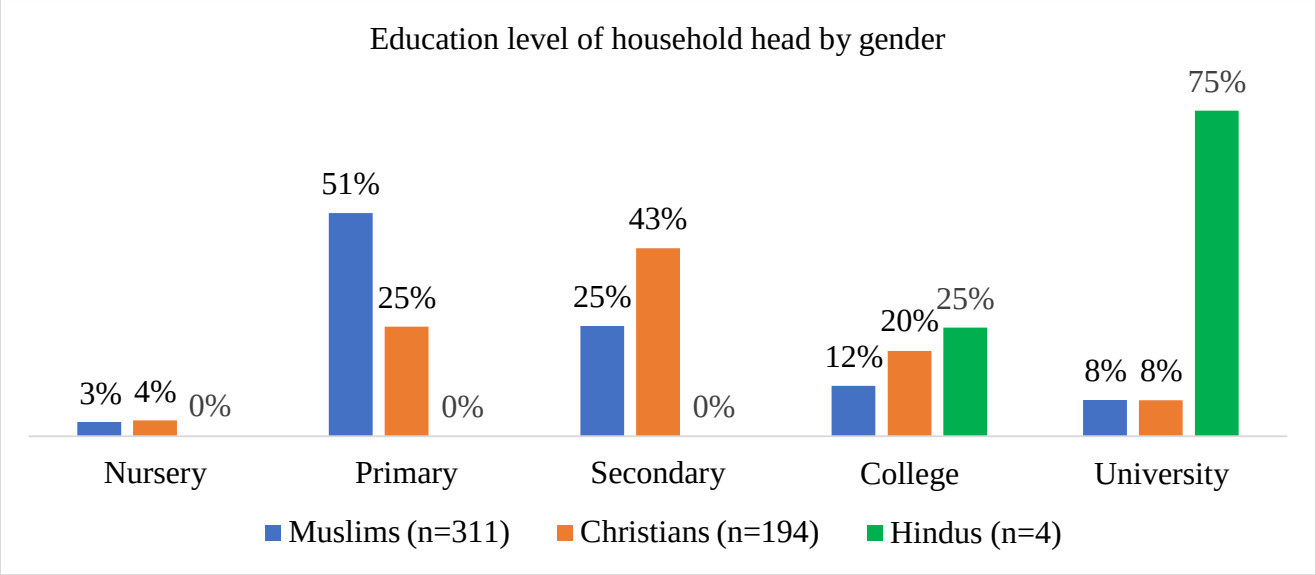

Figure 7: Chart of religion distribution of the household by education level

4.3.5 Households Source of Livelihood

The respondents were asked to indicate their main sources of income to ascertain their capacity to influence the acceptance and adherence to public measures in controlling the pandemic. The findings showed that the key source of livelihood for the sampled households was 43.33% were casual laborers, those in formal employment were less than 15% (6.47% are health care workers, 6.08% are teachers), while others worked as businessmen, tailors and village elders account for 34.31%. See table 4.3.

Table 4. 3: Households' Source of Livelihood

Profession/Work	Number of Responses	Percentage of Responses (%)
Casual worker	221	43.33
Driver	31	6.08
Healthcare worker	33	6.47
Mechanics	19	3.73
Teacher	31	6.08
Others	175	34.31
Total	**510**	**100**

4.3.6 Household Characteristics

The respondents were asked to indicate the youngest and the oldest person within the household. Among the youngest category, the minimum age reported was one year, and the maximum age of 63 years. The oldest category recorded a minimum and maximum of 110 years, respectively. .

Table 4. 4: Household member's demographic characteristics

Variable	Minimum	Maximum	Mean	SD
Age of household Head(N=510)	18	79	42	13
No. of people(N=491)	1	10	5	2.2
Age of Youngest person(N=500)	1	38	11.3	8.5
Age of Oldest person(N=508)	18	110	47	14.12

The respondents also disclosed their water sources, with 53% reporting having a continuous water source. The findings showed that 46% of the households use taped water while 19% get it from a borehole. Other collects water from a variety of other sources, as shown in Table 4.5.

Table 4. 5: Household Source of Water

Water Source	Number (N)	Percentage (%)
tap	236	46.27
bore hole	97	19.02
well	69	13.53
buy	57	11.18
vendors	32	6.27
fresh water	11	2.16
from the mosque	4	0.78
tank	2	0.39
water point	2	0.39

total	**510**	**100**

The findings also showed that of the sampled respondents, 43.7% reside on personally owned premises while 56% live in rented houses. Of those who live in rentals, 21% are in apartments, while the majority (79%) live in communal houses where individuals live in one common housing set up. -

4.3.7 Acceptance of Public Health Measures

Preference for acceptance of public measures was categorized into two: those who disagreed/totally disagreed formed non-acceptance of the measures, while those who agreed/totally agreed formed acceptance of the measures

Table 4. 6: Descriptive statistics of Acceptance of Public Health Measures

Acceptance	Non-acceptance	Neutral	Acceptance	Min	Max	Mean	SD.
Hand-washing	6%	12%	82%	1	5	4.08	0.84
Prevention measures on COVID-19 infection	5%	5%	90%	1	5	4.12	0.8
Coughing/sneeze	3%	2%	95%	1	5	4.25	0.64
Mask wearing	11%	14%	75%	1	5	3.85	0.94
Meals with non-family	37%	18%	45%	1	5	3	1.04
Believe on friends for protection	59%	18%	23%	1	5	2.53	1.07
Believe on vaccines for controlling population	51%	20%	29%	1	5	2.66	1.27
Total	**25%**	**13%**	**63%**			**3.5**	**0.943**

The results in Table 4.6 show that 82% of the respondents accepted hand washing as a measure for controlling COVID-19, while 12% were neutral on the measure, and only 6% had a non-acceptance of the measure (M=4.08, SD=0.84). 90% of the participants accepted that prevention of COVID-19 is necessary, while 5% had a non-acceptance of the measure (M=4.12, SD=0.8). About 95% of the respondents agreed/strongly agreed to paying attention to how they cough/sneeze when in public, while 3% disagreed/strongly disagreed (M=4.25, SD=0.94). It was found that 75% of the respondent accepted wearing of facemask outside as a preventive measure for COVID-19, while 11% disagreed and 14% were undecided (M=3.85, SD=0.94). On the other hand, those who accepted by disagreeing/ strongly disagreeing with the COVID-19 preventive measure of eating with non-family members at the same table and those who believe in their friends and may not use COVID-19 protection around them made up 45% (M=3, SD=1.04) and 23% (M=2.53, SD=1.07) of the respondents respectively. About 29% accepted the belief that vaccines are used to control a population, 51% disagreed/ strongly disagreed, and 20% were undecided (M=2.66, SD=1.27).

Overall, 63% of respondents agreed/strongly agreed to accept the public measures for controlling COVID-19, indicating a high acceptance of the public health measures for controlling the COVID-19 pandemic compared to 25% of those who did not accept the preventive measures and 13% of those who were undecided (M=3.5, SD=0.943).Table 4.7 below gives a summary of the results of the variations between gender on preference to acceptance. Respondents were expected to indicate their gender to determine its influence as a confounding variable.

Table 4. 7: Variation of Acceptance of Public Health Measures with Gender

Acceptance	Female			Male		
	Non-acceptance	Neutral	Acceptance	Non-acceptance	Neutral	Acceptance

Hand-washing	8%	19%	73%	6%	3%	91%
Prevention measures for Covid -19	6%	6%	88%	6%	3%	91%
Coughing/sneeze	2%	3%	95%	3%	1%	96%
Mask wear	12%	20%	68%	38%	6%	56%
Meals with non-family	36%	24%	40%	38%	11%	51%
Believe on friends for protection	46%	24%	30%	63%	8%	29%
Believe on vaccines for controlling population	49%	25%	26%	56%	11%	33%
Totals	**23%**	**17%**	**63%**	**30%**	**6%**	**63%**

When comparing male and female respondents, 63% of men had a more favorable attitude toward accepting the proposed preventive measures. Men were more likely to strongly advocate practices like hand washing (91%), preventing measures of the spread of COVID-19 (91%), and being attentive while coughing or sneezing in public (96%), while women were more likely to accept face mask at 68%.

Variations between age groups and the dependent variables were assessed. 68% of the respondent aged between 30 and 39 years strongly accepted hand washing (94%), necessary COVID-19 prevention measures (90%), and paying attention while sneezing/coughing in public areas (97%). On if the participants will use protection against COVID-19 while midst of their friends, 28% had the believe that safety of their friends will not warrant them to use protection, 14% were neutral while 58% accepted using protection around their friends. 33% of the participants within the same age group believed that vaccines can be used to control a population, 43% were undecided while 24% disagreed with the statement. Paying attention while coughing/ sneezing in public places was the most accepted measure across all the age groups. Overall, approval by age groups for the

preference for acceptance of the measures include 67% for ages below 30 years, 68% for those between 30-39 years, 58% between 40-49 years, and 60% for ages above 50 years.

On education level and preference for acceptance of public measures, approval rates on hand washing as a measure was highest for those who went past secondary school: college (100%), secondary level (94%), university (98%), and, similarly to all other measures except on believe on friend's safety for protection against COVID-19 and the believe on vaccine for controlling a population whose approval rate decreases as the level of education increases. On average, Nursery level recorded 59% approval rate with 41% being undecided. Those with primary level recorded a higher proportion of households who are undecided (71%) with 28% approving the measures and only 1% disapproving the measures. Those with secondary level of education 50% approved the measures while 49% undecided and 1% disapproved the measures. On college level and university level, those who approved the measures were 53% and 69% respectively while those who were undecided were 47% and 31% respectively as shown in figure 8 below

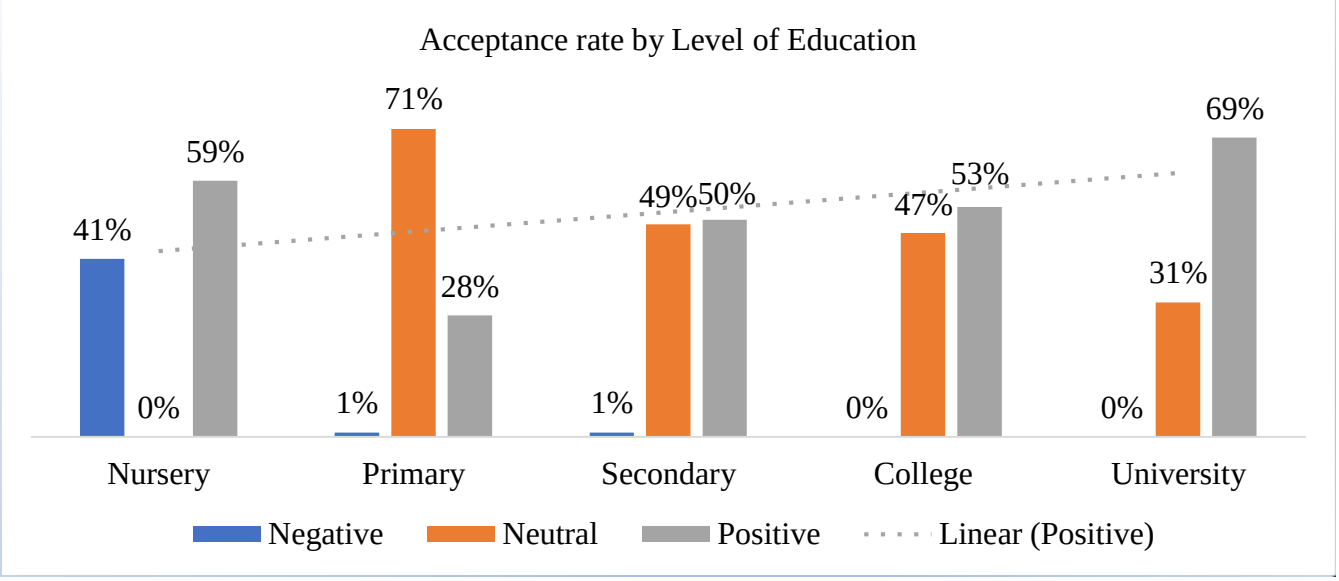

Figure 8: Level of Education on Acceptance of COVID19 Prevention Measures

There was a low acceptance of the statement “If I believe in My friends, I may not use protection against COVID-19 when I am around them” at primary level (19%), secondary level (27%), college-level (24%) and university level (9%) but high on nursery level (67%). Similarly, to the belief that vaccines can be used to control a population where primary level (27%), secondary level (34%), college-level (13%), and university level (33%) recorded lower acceptance contrary to nursery level which recorded a high positive orientation (61%).

Variations of religion on preference to acceptance of public health measures, acceptance rate to the statement was higher among those who practice Hinduism (96%). Christianity recorded a 67% acceptance rate for the measures, while those who practice Islam reported 60% acceptance of the measures.

In the profession, most of those with a high acceptance rate of the measures were healthcare workers (72%), closely followed by teachers (58%). Casual laborers (33%), drivers (42%), and mechanics (47%), while other professions, including businesspeople, village elders, tailors, and others, all had a 49% acceptance rate.

Descriptive findings on whether there exists a continuous water source and preference for acceptance of public measures controlling COVID-19 show that despite not having a continuous source of water, 67% of the respondents showed acceptance of the practice of the preventive measures as compared to their counterparts with a continuous water source who recorded 65% acceptance rate. In addition, those who did not have a continuous water source reported a 90% acceptance of hand washing compared to their counterparts with 76% acceptance of the measure.

4.3.8 Adherence of Public Health Measures

The study sought information regarding respondents' preference for adherence to public measures for controlling COVID-19 in Mombasa. The information obtained is presented in Table 4.8.

Findings show that 83% of the respondents were compliant with adherence to regular hand washing as a preventive measure, with a mean of 4.06. Clearly, the mean of 4.06 and an SD of 0.8 shows that most respondents were in agreement to adherence with the public health preventive measures as indicated by the fourth likert scale item representing agreament to the statement.

Table 4. 8: Descriptive Statistics of Adherence of Public Health Measures

Preference on Adherence	Mean	SD.	Min	Max	95% CI
Handwashing	4.06	0.83	1.00	5.00	3.99-4.13
Necessary COVID-19 prevention	4.09	0.83	1.00	5.00	4.01-4.16
Paying when coughing/Sneezing	4.21	0.66	1.00	5.00	4.16-4.27
Mask wear when going out	3.85	0.94	1.00	5.00	3.76-3.93
Meals with non-family members on the same table	3.05	1.02	1.00	5.00	2.96-3.14
Believe on friends for protection	2.53	1.07	1.00	5.00	2.43-2.62
Believe on vaccines for controlling a population	2.64	1.26	1.00	5.00	2.53-2.75
Total	**3.49**	**0.94**	**1.00**	**5.00**	

On necessary prevention measures of COVID-19, 89% of the respondent recorded a high adherence to the measure, while 7% were non-adherence and 5% were undecided(M=4.09, SD=0.826, 95% CI=4.01-4.16). Paying attention while sneezing in public reported 94% adherence to the measure (M=4.21, SD=0.656, 95% CI=4.16-4.27) and 75% for mask wearing while going out (M=3.85, SD=0.935, 95% CI=3.76-3.93). Low approvals were recorded on having meals with family and strangers (42%), belief in friends' protection against COVID-19 (23%), and belief in vaccines for controlling a population (29%). The means for these categories are 3.05, 2.53, and 2.64, respectively.

Gender variations in the preference for adherence to public measures were also assessed. As presented in Table 4.9 below, males are more likely to adhere to the preventive measures (M=3.55, SD=0.94) than their female counterparts (M=3.44, SD=0.93). The least preferred measures for both genders are belief in friends for protecting them in the control of the disease (M=2.52, SD=0.96 for females: M=2.54, SD=1.2 for males) and belief in vaccines for controlling the population (M=2.64 for females: M=2.65 for males). For having meals with family and friends, the respondents showed a neutral position on the statement with a mean of 3.0 for females and 3.11 for Males, which is almost exact with the neutral position on our Likert scale. The findings showed that males (68%) were more likely to adhere to preventive measures than their female counterparts (57%).

Table 4. 9: Variations of Gender and Adherence of Public Health Measures

Gender	**Female**		**Male**	
Preference on adherence	**Mean**	**SD.**	**Mean**	**SD**
Hand-washing	3.91	0.91	4.26	0.67
Prevention of COVID-19 is necessary	4.06	0.83	4.12	0.81

Coughing/Sneeze	4.2	0.63	4.24	0.677
Mask wear	3.75	0.98	3.98	0.8565
Meals with non-family	3	0.977	3.11	1.0625
Believe on friends for COVID-19 protection	2.52	0.966	2.54	1.2
Believe on vaccines for controlling a population	2.64	1.22	2.65	1.31
Total	**3.44**	**0.93043**	**3.55714**	**0.94086**

Comparison of preference on adherence to public measures with education level was also assessed. According to the findings presented in Table 4.10, overall, the age category below 30 years has a higher approval for the measures than the other age groups (M=3.6, SD=1.04). The findings make the group more likely to adhere to the measures than the other groups. On the individual measures, paying attention to how one sneezes/coughs in public is presented as: below 30 years (M=4.1, SD=0.92), 30-39 years (M=4.2, SD=0.74), 40-49 years (M=3.9, SD=1) and those on the age group above 50 years (M=4, SD=0.67). As a result, all age groups are more likely to agree on adherence to hand washing as a preventive measure, although adherence is higher in ages between 30-39 years. On the other hand, belief in friend's protection: below 30 years (M=2.7, SD=1.17), 30-39 years (M=2.5, SD=1.14), 40-49 years (M=2.5, SD=0.99) and those on the age group above 50 years (M=2.5, SD=1). All ages are more likely to disagree with this negative statement. Other statements descriptions are given in Table 4.10 below.

Table 4. 10: Variations of Age Groups on Adherence of Public Health Measures

Age Group	**Below 30 Yrs.**	**30-39 Yrs.**	**40-49 Yrs.**	**50 and above**
Statistics	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Hand-washing	4.1(0.92)	4.2(0.74)	3.9(1)	4(0.67)

Prevention	4(0.97)	4.1(0.94)	4.1(0.71)	4.1(0.71)
Coughing/Sneeze	4.2(0.82)	4.2(0.74	4.2(0.58	4.2(0.52)
Mask wear	4(0.96)	3.9(1)	3.7(0.98)	3.9(0.82)
Meals with non-family	3.1(1.08)	3.1(1.07)	2.9(0.95)	3.1(0.98)
Believe on friends	2.7(1.17)	2.5(1.14)	2.5(0.99)	2.5(1)
Believe on vaccines	2.8(1.39)	2.7(1.33	2.6(1.15)	2.6(1.2)
Total	**3.6(1.04)**	**3.5(0.99)**	**3.4(0.91)**	**3.5(0.84)**

The study also assessed the variation between education level and preference for adherence to public health measures. The findings as presented in Table 4.10 shows that those who went through university education level had higher adherence to the preventive public measures (M=3.75, SD=0.88) as compared to other levels of study, especially on hand washing (M=4.71, SD=0.51) and paying attention to how one sneezes/ coughs in public (M=4.76, SD=0.43) which is close to the strongly agree Likert scale item clearly showing that they have a high adherence towards the preventive measures. In addition, on paying attention to how one sneezes/coughs in public, the approval rating increased as the level of education increased, as shown by the mean of individual level in Table 4.11 below.

Table 4. 11: Variations of Education on Adherence to Public Health Measures

education statistics	**nursery mean(SD)**	**primary mean(SD)**	**secondary mean(SD)**	**college mean(SD)**	**university mean(SD)**
Hand-washing	3.67(1.53)	3.76(0.92)	4.16(0.53)	4.4(0.62)	4.71(0.51)
Prevention	3.56(1.5)	3.89(0.81)	4.15(0.72)	4.4(0.64)	4.51(0.82)

Coughing/Sneeze	3.72(1.56)	4.08(0.56)	4.2(0.56)	4.44(0.62)	4.76(0.43)
Mask wear	3.39(1.58)	3.43(0.93)	4.07(0.73)	4.31(0.66)	4.42(0.75)
Meals with non-family	3.5(1.47)	2.92(0.89)	3.2(1.07)	2.85(0.98)	3.24(1.07)
Believe on friends	3.39(1.5)	2.59(0.94)	2.55(1.07)	2.47(1.19)	1.89(0.96)
Believe on vaccines	3.44(1.62)	2.82(1.06)	2.61(1.26)	2(1.19)	2.69(1.64)
Total	**3.5(1.54)**	**3.36(0.87)**	**3.56(0.85)**	**3.55(0.84)**	**3.75(0.88)**

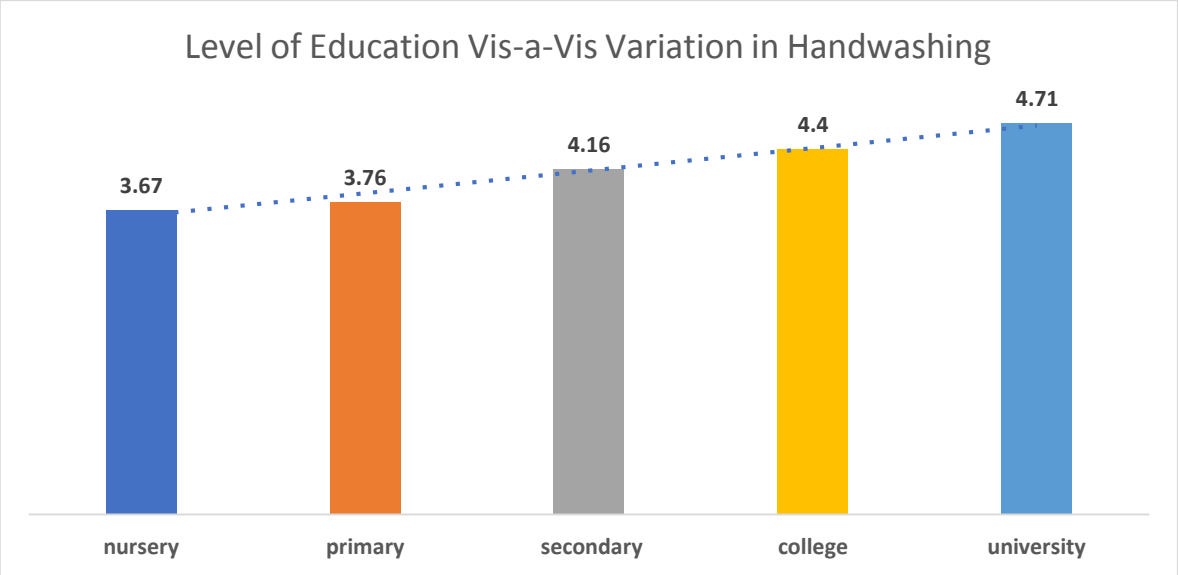

Figure 9: Level of Education Vis-a-Vis Variation in Handwashing

Figure 9 above depicts level of education vis-à-vis the acceptance handwashing preventative measure whereby by a higher level of education signifies a higher acceptance levels. The findings showed that on religion, those who practice Hinduism were more likely to adhere to the preventive measures compared to the other religions (M=4.18, SD=0.21). Regular hand washing,

necessary prevention, and paying attention to how one sneeze in public were highly preferred preventive measures while believing friends for protection and belief on vaccines to control a population had non-adherence, indicating respondents are more likely to disagree with the measures. Results are presented in Table 4.12 below.

Table 4. 12: Variations in Religion on Adherence of Public Health Measures

religion	**Christianity**	**Hinduism**	**Islam**
statistics	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Hand-washing	4.17(0.77)	5(0)	3.99(0.84)
Prevention	4.13(0.87)	5(0)	4.06(0.78)
Coughing/Sneeze	4.22(0.73)	5(0)	4.22(0.58)
Mask wear	3.98(0.94)	4.75(0.5)	3.76(0.91)
Meals with non-family	3.08(1.08)	3.5(1)	3.03(0.98)
Believe on friends	2.53(1.14)	1(0)	2.54(1.01)
Believe on vaccines	2.71(1.37)	5(0)	2.57(1.16)
Total	**3.55(0.99)**	**4.18(0.21)**	**3.45(0.89)**

Overall, approval of the measures is lower on those who practice islam (M=3.45, SD=0.89) than their christians (M=3.55, SD=0.99) and hindus counterparts (M=4.18, SD=0.21). The variation in approval rate is highly attributed to education level. Muslims demonstrated low approval rate due to the majority of their sampled population attained education level lower than secondary level (55%) as shown in figure 10 below.

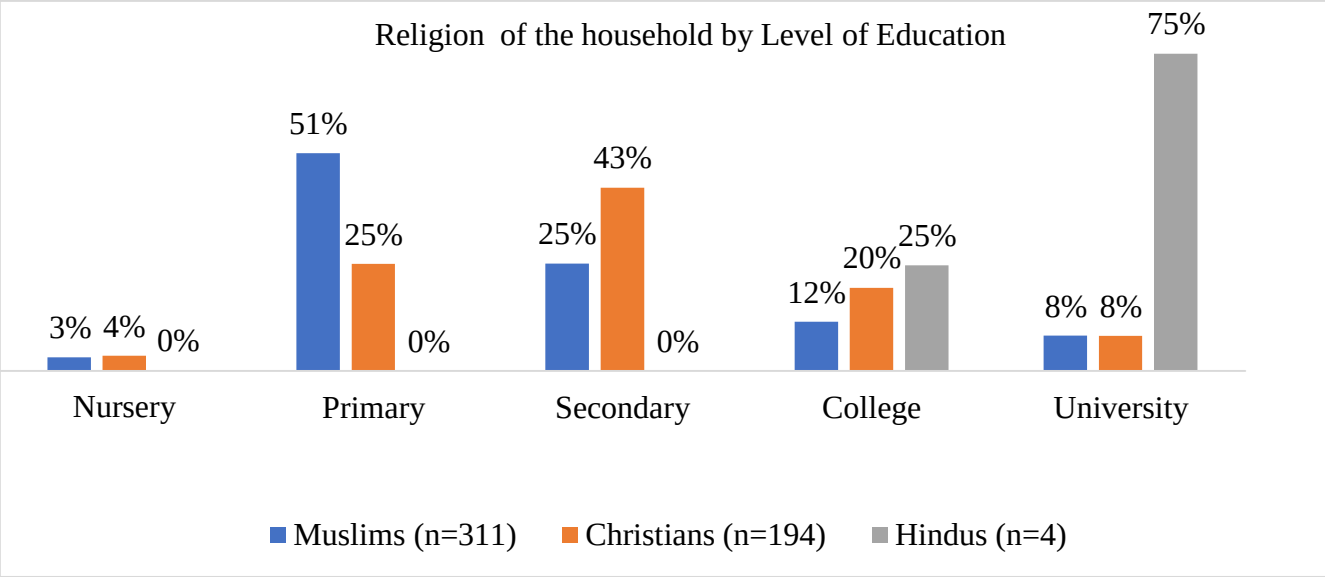

Figure 10: Variation of Religion of the household by education level

Findings showed that healthcare workers tended to adhere to the preventive measures (M=3.7, SD=0.9) compared to the other professions, which shows that they are more likely to agree to the measures. The drivers' category had the lowest adherence (M=3.4, SD=0.9), closely followed by casual laborers (M=3.41, SD=1). Paying attention to coughing/ sneezing in public was more agreeable among the health care workers (M=4.73, SD=0.45). Believe in friend's protection and belief in vaccines recorded the lowest adherence among all the other measures, as shown in Table 4.13.

Table 4. 13: Variations of Profession on Adherence of Public Health Measures

profession **statistics**	**casual laborer** **mean (SD)**	**Driver** **mean (SD)**	**HCW** **mean (SD)**	**mechanics** **mean (SD)**	**teacher** **mean (SD)**	**Others** **mean (SD)**
hand-washing	3.78(1)	4.13(0.56)	4.67(0.48)	4.37(0.6)	4.55(0.51)	4.17(0.59)

prevention	3.94(0.93)	4.03(0.8)	4.61(0.79)	4.05(0.85)	4.58(0.5)	4.11(0.66)
Coughing/Sneeze	4.12(0.72)	4.1(0.6)	4.73(0.45)	4.42(0.51)	4.58(0.5)	4.18(0.58)
Mask wear	3.53(1.08)	3.94(0.63)	4.58(0.5)	3.89(0.88)	4.48(0.51)	3.98(0.73)
Meals with non-family	3.04(0.98)	2.94(1.06)	2.88(1.08)	3.32(0.95)	2.94(1.03)	3.11(1.05)
Believe on friends for protection	2.64(1.08)	2.42(1.09)	2(1.3)	2.79(1.13)	2.26(1)	2.51(0.98)
Believe on vaccines	2.79(1.24)	2.55(1.29)	2.42(1.68)	2.84(1.3)	2.16(1.39)	2.58(1.14)
Total	**3.41(1**)	**3.4(0.86)**	**3.7(0.9)**	**3.67(0.89)**	**3.65(0.78)**	**3.52(0.82)**

As shown in figure 11 below, majority of those with university degrees are health care workers (42%), 6% are casual laborers and drivers, 26% are mechanics, 10% are teachers while 9% are either business people or in self employment. Those with college degrees, 39% are health care workers, 45% are teachers, 21% are mechanics, 16% are drivers, 6% are casual laborers while 15% are practicing other profressions. Majority of those who are casual laborers have primary level of education (62%), majority of the drivers have secondary level qualification (48% same to to mechanics (37%) and those who practice other professoion (40%).

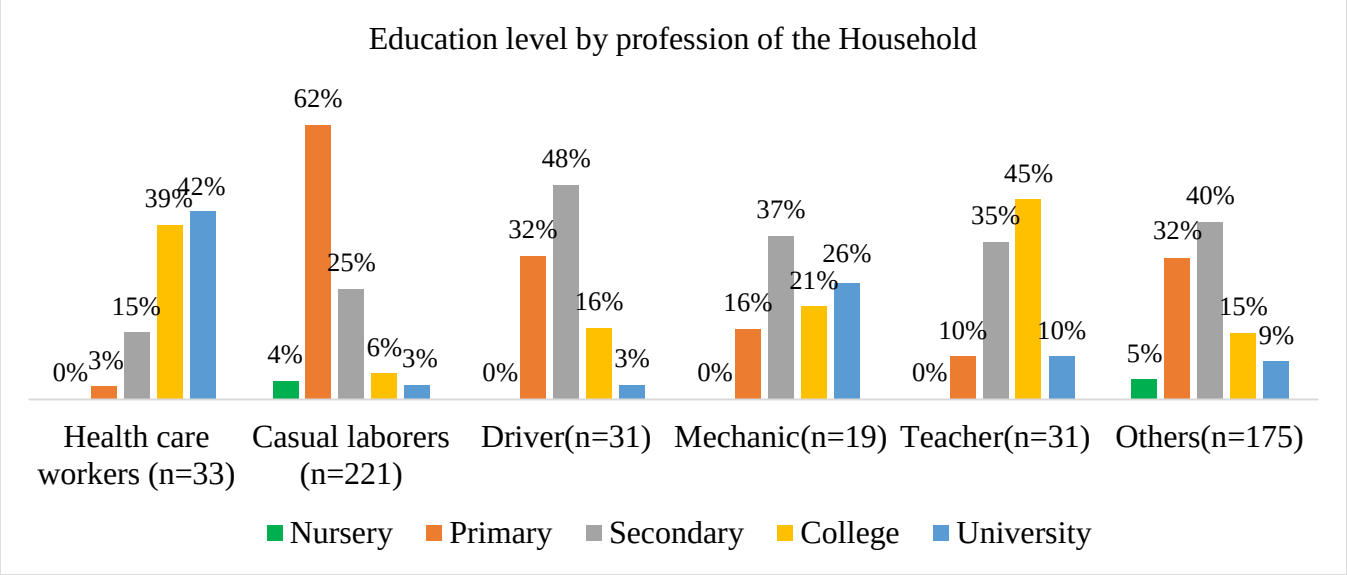

Figure 11: Education level of households heads by profession

In terms of the availability of a continuous water source, respondents who did not have access to a continuous source of water (M=3.40, SD=1.02) had a higher tendency to adhere to public health preventive measures in comparison to those who have a continuous source of water (M=3.35, SD=0.94).

4.3.9 Subjective Norms

Those who disagreed/ totally disagreed on the subjective norms were categorized to have a negative belief about the measures, and those who totally agreed/agreed were judged to have a positive belief about the measures. The demographic characteristic is shown in Table 4.14.

Table 4. 14: Descriptive Summary of Subjective Norms

Subjective Norms	Negative belief	Neutral	Positive belief	Min	Max	Mean	SD.
Cover face (mask/hijab)	8%	6%	86%	1	5	4	0.79
Cover mouth when sneezing/coughing	2%	2%	96%	1	5	4.25	0.62
Eat in company of friends	46%	16%	38%	1	5	2.93	1.05

Hand washing before meals	2%	2%	96%	1	5	4.27	0.64
Preference on greetings	61%	21%	18%	1	5	2.51	0.95
Weddings/funerals	47%	26%	27%	1	5	2.77	0.99
seat sharing in matatu/waiting room	30%	25%	45%	1	5	3.15	1
Prayers in congregation	36%	19%	45%	1	5	3.1	1.06
Total	**29%**	**15%**	**56%**			**3.4**	**0.88**

86% of respondents agreed/strongly agreed to cover their faces with Hijab when going out, while only 6% disagreed/strongly disagreed (M=4.0, SD=0.79). Covering the mouth when sneezing or coughing was viewed positively by 96% of respondents, while 2% disagreed (M=4.27, SD=0.64).

Regarding eating out with friends and strangers at the same table, 38 percent had a positive belief in the statement, while the majority (46 percent) had a negative belief in the positive statement (M=2.93, SD=1.05). 96% of participants believed hand washing before meals was important, while only 2% disagreed (M=4.27, SD=0.64). Most participants (61%) aligned themselves with the negative belief of the positive statement regarding hand-shaking greetings (M=2.51, SD=0.95).

Forty-seven percent disagreed with "I can't miss weddings or funerals" (M=2.77, SD=0.99). Forty-five percent of participants agreed with the statement about sharing matatus or waiting for bay seats, while 30 percent disagreed (M=3.15, SD=1.0). In addition to the measures, 36% of respondents had a negative view of praying in congregation, while 45% had a positive view (M=3.1, SD=1.06). On average, 56% of participants believed statements measuring subjective COVID-19 prevention behaviors, while 29% did not (M=3.4, SD=0.88).

4.3.10 Attitudes towards Preventive Public Health Measures

Respondents' attitudes towards preventive measures were also evaluated using a Likert scale. Those who agreed/strongly agreed with the negative statements were categorized as having a negative attitude, while those who disagreed/ strongly disagreed with the negative statements were viewed as having a positive attitude towards the measure.

Table 4. 15: Descriptive Summary of Attitude towards Preventive Public Health Measures

Attitudes (N=510)	Negative attitude	Neutral	Positive attitude	Min	Max	Mean	SD.
hand washing	11%	16%	73%	1	5	2.21	0.97
face masks	9%	15%	76%	1	5	2.09	0.93
infection	8%	17%	75%	1	5	2.04	0.94
travelling	23%	23%	54%	1	5	2.56	1.04
gatherings	50%	19%	31%	1	5	3.14	1.09
going out with friends	10%	24%	66%	1	5	2.36	0.86
closing bars, clubs	26%	27%	47%	1	5	2.72	1.01
restrictions	25%	22%	53%	1	5	2.67	1.16
the rich and poor	80%	16%	4%	1	5	1.82	0.87
Total	**18%**	**20%**	**53%**			**2.4**	**0.99**

As shown in Table 4.15, 73% of respondents had a positive attitude towards hand washing as a preventive measure, 11% had negative attitude while 16% were undecided (M=2.21, SD=0.97). 76% of respondents were positive about facemasks, 15% were undecided while 9% were negative (M=2.09, SD=0.93).

8% of respondents said they would only observe preventive measures if infected, indicating a negative attitude toward the measures. 75% of study participants had a positive attitude toward the negative statement (M=2.04, SD=0.94). 23% of respondents said they will always ignore COVID-

19 precautions and travel with friends due to peer pressure; 54% had a positive attitude towards the negative statement (M=2.56, SD=1.04).

50% of respondents had a negative attitude toward gatherings, while 31% were positive (M=3.14, SD=1.09). 10% of respondents reported being influenced by friends to go out unwillingly due to peer pressure and were automatically??? categorized as having a negative attitude towards the positive statement (M=2.36, SD=0.86). 47% of respondents favored closing bars, clubs, and other entertainment venues, while 26% were opposed (M=2.72, SD=1.01). Twenty-five percent (25%) of respondents said COVID-19 restrictions were too strict, indicating a negative attitude, while 53 percent disagreed/strongly disagreed, indicating a positive attitude (M=2.67, SD=1.16). Eighty percent disagreed with the statement, "COVID-19 mostly affects the rich" (M=1.82, SD=1.16). 53% of respondents had a positive attitude towards preventing COVID-19 (M=2.4, SD=0.87).In overall as shown in figure 12 below , those who attained low levels of education (nursery level=24% and primary levels=8%) recorded higher proportion of households with positive attitudes towards the negative statements while those in secondary level (80%), college level (83%) and university level (73%) reported higher proportions of those with negative atttudes towards the negative statements.

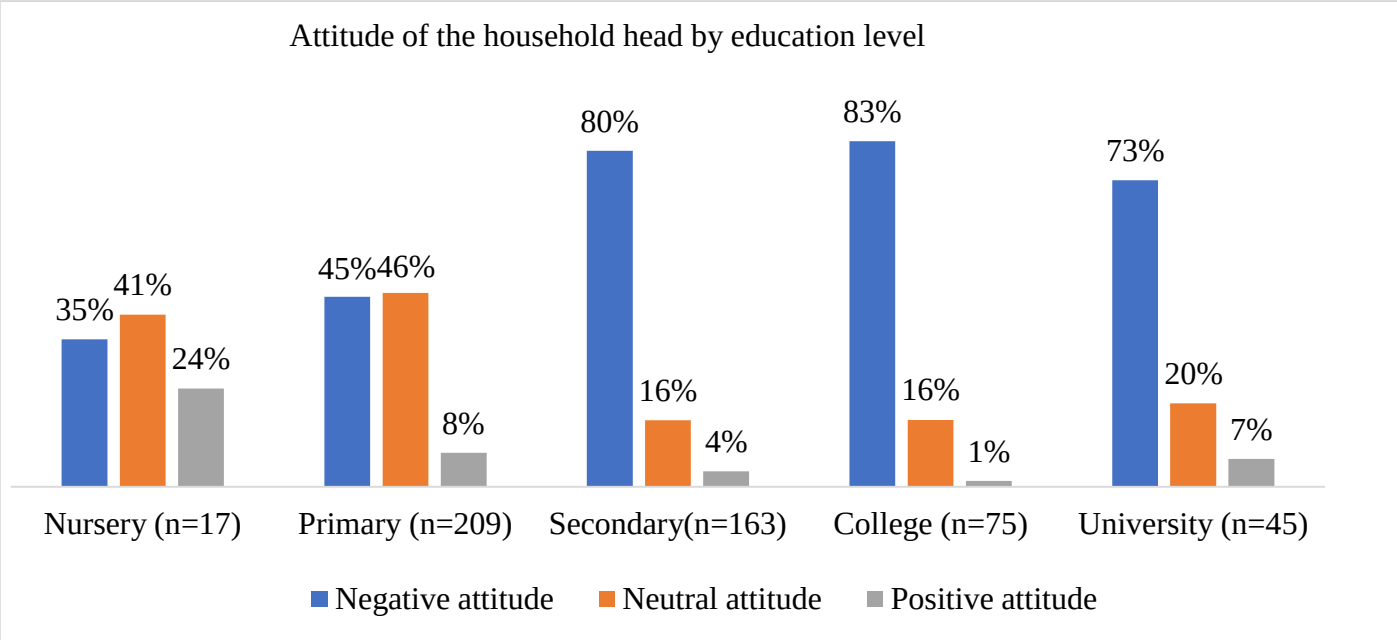

Figure 12: Attitude of the household head by education level

4.3.11 Perceived Controlled Behavior

Findings on perceived control behavior reported in Table 4.16 showed that an overall total of 70% of the respondents had larger scores which indicated a positive control behavior, 14% had less positive self control behaviour while 16% were undecided.

Table 4. 16: Descriptive Summary of Perceived Controlled Behavior

Perceived Controlled Behavior (N=510)	Low	Neutral	High	Min	Max	Mean	SD.
Adherence to public measures	22%	13%	65%	1	5	3.57	1.02
peers' adherence to public measures	22%	21%	57%	1	5	3.38	1.09
confidence on adherence	4%	15%	81%	1	5	3.94	0.72
regular adherence to public measure	7%	15%	78%	1	5	3.84	0.79
Total	**14%**	**16%**	**70%**			**3.7**	**0.91**

Most endorsed with larger scores of public controlled behaviors included "I am confident that if I wanted to, would adhere to public health measures regularly (81%) and "For me to adhere to public measures regularly is not a problem (78%). The two showed a high positive control behavior. On the other hand, "Whether or not I adhere to public health measures regularly is completely up to me (65%), and "Most of my peers whom I am acquainted with adhering to public health measures regularly (57%) showed high positive controlled behavior although not perfect.

Table 4. 17: Descriptive statistics for dependent, independent and confounding variables

Variable		Observations	Mean/Proportion	Standard Deviation	Min.	Max.
Normative Behavior	Subjective	510	.3294	.4705	0	1
	Attitude	510	.3549	.4789	0	1
	Perceived	510	.3157	.4652	0	1
Acceptance	Agree	510	.4902	.5004	0	1
	Disagree	510	.5098	.5004	0	1
Adherence	Agree	510	.4392	.4968	0	1
	Disagree	510	.5608	.4968	0	1
Age		510	42.4059	13.1744	16	79
Gender	Male	510	.5706	.4955	0	1
	Female	510	.4294	.4955	0	1

Education	Nursery	510	.0353	.1847	0	1
	Primary	510	.4098	.4923	0	1
	Secondary	510	.3196	.4668	0	1
	College	510	.1471	.3545	0	1
	University	510	.0882	.2839	0	1
Religion	Pagan	510	.0019	.0443	0	1
	Hinduism	510	.0078	.0883	0	1
	Islam	510	.6098	.4883	0	1
	Christianity	510	.3804	.4859	0	1
Work	Others	510	.3431	.4752	0	1
	Casual laborer	510	.4333	.4960	0	1
	Driver	510	.0607	.2391	0	1
	Mechanics	510	.0372	.1895	0	1
	Teacher	510	.0607	.2391	0	1
	Healthcare worker	510	.0647	.2462	0	1

Attitude was the most prevalent category for normative behaviour (35.49%) followed by subjective (32.94%) and perceived category (31.57%). For acceptance, majority of the respondents (50.98%) were agreable compared to 49.02 per cent who disagreed with public health measures for controlling COVID-19 in Mombasa County. On adherence, 56.08 per cent of the respondents were agreable to adhering to public health measures for controlling COVID-19 in Mombasa County compared to 43.98 per cent who disagreed with the preventive health measures.

Table 4.18:Frequency distribution between the dependent and key independent variable

Dependent Variable		**Key independent variable (Normative behaviour)**			**Total**
Acceptance		Subjective	Attitude	Perceived	
	Agree	72(42.86%)	95(52.49%)	83 (51.55%)	250(49.02%)
	Disagree	96 (57.14%)	86 (47.51%)	78 (48.45%)	260(50.98%)
Total		168(100.00%)	181(100.00%)	161(100.00%)	510(100.00%)
Adherence	Agree	65 (38.69%)	85(46.96%)	74 (45.96%)	224(43.92%)
	Disagree	103 (61.31%)	96(53.04%)	87 (54.04%)	286(56.08%)
Total		168(100.00%)	181(100.00%)	161(100.00%)	510(100.00%)

Majority (57.14%) of the respondents who disagreed with the public health measures for controlling COVID-19 were had a subjective normative behaviour while 52.49 per cent and 51.35 per cent of those agreeing with the public health measures to control COVID-19 had an attitude

normative behaviour respectively. Majority of the respondents with the subjective (61.31%), attitude (53.04%), and perceived (56.08%) normative behaviour were were not agreeable to adhering to the public health measures for controlling COVID-19.

4.4 The Extent to which Normative Behavior is Associated with Acceptance of Public Health Measures

The first objective was to determine the extent of the association between normative behavior and the acceptance of public health measures for controlling COVID-19 in Mombasa County. Chi-square was used to determine the association between normative behavior and acceptance of public health measures for controlling COVID-19 and the confounding variables. A 5% significance level was used to assess the association level.

4.4.1 Association between Age Groups and Acceptance of Public Health Measures

The Chi-square statistic was used to investigate the link between age with acceptance of public health measures to counter COVID-19 in Mombasa. The null hypothesis to be examined was that there is no significant association between age and the acceptability of public health measures. The results in table 4.19 below show that the pearson chi-square is ($\chi 2$ =16.91, df=6, $p=0.01$). We reject the null hypothesis since the p-Value of the results is smaller than our significant *P-Value*($p<0.05$). The findings reveal a significant association between age and inclination to acceptance of public health measures.

Additionally, Cramer's V (0.13) demonstrates the existence of a connection, although a weak one. According to the findings, those between the ages of 30 and 39 years (68%) are more likely to practice the acceptance of the preventive measure (68%) as compared to other age groups, although the acceptance rate decreases as age increases. This study finding is contrary to Wolfe, Sirota, &

Clarke (2021), whose study findings showed that age differences affect the adoption of preventive health measures and that younger adults are less likely to implement the preventive measures compared to older adults. These findings is explained by the majority of the household heads in this study below 30 years old having higher level of education compared the ageing population. According to the findings, 74% of households attained secondary level of education and above compared to 62% of those between 30 and 39 years , 47% for those between 40 and 49 years and 46% for those between 50 and above. Clearly, it shows education level decreases as age increases thus high literacy for the younger population compared to the ageing population. With the high literacy level, the younger population are more likely to adopt the preventive measures.

Table 4. 19: Chi-Square between Age Groups and Acceptance of Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	16.91	6	0.01
Likelihood Ratio	17.95	6	0.006
Cramer's V	0.13		
N of Valid cases	510		

4.4.2 Association between Gender and Acceptance of Public Health Measures

Table 4.20 presented the Chi-square Values between gender and preference for acceptance of public health measures. The results showed that gender is statistically associated with preference for acceptance of public measures ($\chi 2$=8.65, df=2, $p<0.05$). These results highlight the importance of gender variations in affecting the uptake of public health preventative strategies. In this study, males were found to be more inclined than females to take precautions against COVID-19. Men

were more likely to highlight the necessity of washing one's hands (91%) than women (73%). According to the research, the majority of male heads (69%) completed secondary level schooling more than their female counterparts (46%). This indicates that the male heads of households have a high form of knowledge, which in turn indicates that they are more likely to follow recommended health precautions.

Similarly, Tan et al. (2021), in their research on gender differences in health protective behaviors during the COVID-19 pandemic in Taiwan, found out that the female gender was associated with decreased acceptance to receive vaccination compared to the male gender. In contrast to hand washing, for which females had a lower acceptance rate than males whereasmore females than males approved of mask use. According to prior research conducted in the United States, males viewed wearing a mask as a sign of weakness. (Capraro & Barcelo, 2020).

Table 4.20: Chi-Square between Gender and Acceptance of Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	8.65	2	0.013
Likelihood Ratio	10.49	2	0.005
Cramer's V	0.1303		
N of Valid cases	510		

4.4.3 Association between Education Level and Acceptance of Public Health Measures

The results presented in Table 4.21 showed that at a significant level of $p=0.05$, the Chi-square statistics showed that education level is statistically associated with preference for acceptance of public health measures (χ=45.11, df=8, $p<0.05$). According to the findings, acceptance of health

preventive measures increases as the level of education increases. Acceptance of handwashing was highly approved by those who went past the secondary level of education; secondary level (94%), college (100%), and university level (98%) as compared to primary level (64%) and nursery (78%) similar to all other measures on acceptance.

Similar to the findings of Raghupathi & Raghupathi (2020) on the influence of education on health, an empirical evaluation of OECD countries between 1995 and 2015 revealed that those with a high level of education have better health, as evidenced by high levels of self-reported health and low levels of illness, mortality, and disability. Low educational attainment is consequently connected with self-reported poorer health, reduced life expectancy, and reduced survivability when sick.

Table 4.21: Chi-Square between Education and Acceptance of Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	45.11	8	0.000
Likelihood Ratio	45.149	8	0.000
Cramer's V	0.2103		
N of Valid cases	510		

4.4.4 Association between Religion and Acceptance of Public Health Measures

The pearson chi-square value of 113.41 at 6 degrees of freedom with a *P-Value* ($p<0.05$), as presented in Table 4.22, showed a significant relationship between the religion of the respondent and the preference for acceptance of the public health measures. The result implies that acceptance of the practice of public health preventive measures is affected by differences in religion. Hindu believers (96%) were more inclined than their Christian (67%) and Muslim (60%) counterparts to accept the adoption of public health preventive measures. A study in Europe and America on the role of religion in COVID-19 prevention found that religion, especially religious leaders, plays a

vital role in influencing their faithful on the acceptability of public health preventive measures. However, the adoption varies by religion and among the faithful (Senior Editor, 2020).

Table 4. 22: Chi-Square between Religion and Acceptance of Public Health Measures

Test Statistics	Value	df.	asymptotic sig.(2-sided)
Pearson Chi-Square	113.41	6	0.000
Likelihood Ratio	24.98	6	0.000
Cramer's V	0.33		
N of Valid cases	510		

4.4.5 Association between Profession and Acceptance of Public Health Measures

Table 4.23 highlights the chi-square statistics used to check for the association between profession and the preference for acceptance of public health measures. The results showed statistical significance between preference for acceptance of public health measures and profession ($\chi 2=31.79$, $p<0.05$). The findings imply that differences in profession types have a significant effect on how an individual accepts to practice the public health preventive measures. Findings showed that healthcare workers (73%) had a high likelihood of accepting the practice of public health preventive measures compared to other professions. Other corroborating studies in the Gamo zone, southern Ethiopia, showed that health professionals (35.3%) had good practice in the precautionary measures for the COVID-19 pandemic (Mersha et al., 2021).

Table 4.23: Chi-Square between Profession and Acceptance of Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	31.79	10	0.000
Likelihood Ratio	33.90	6	0.000

Cramer’s V	0.18
N of Valid cases	510

4.4.6 Association between the Availability of a Continuous Source of Water and Acceptance of Public Health Measures

The study also evaluated if there is a statistical significance between continuous water sources and preference for acceptance of public health measures. The chi-square statistics, as presented in table 4.24, showed no statistical significance between a continuous water source and preference for acceptance of public health measures ($\chi 2=1.041$, df=2, $p>0.05$). The Crammer's Value (V=0.0452) also validated the chi-square statistics indicating no significant relationship. The results demonstrate that access to running water is not a determining factor in whether or not a household accepts public health initiatives.

The findings indicate that since water is essential for controlling and preventing the spread of the COVID-19 pandemic, respondents were eager to practice handwashing, a key public preventive measure for controlling the COVID-19 pandemic. The results showed that 54% of individuals with access to clean water, only 42% were willing to adopt all the public health precautions while 48% were neutral. On the other hand, 46% of those who have no access to a continuous supply of clean water, 45% accepted the practice of all the public health measures for COVID-19. Variation on hand washing shows that only 76% of those with a continuous supply of clean water accepted the measure, as compared to 90% of those with no access to a continuous water supply. People who don't always have access to clean water are more likely to agree that washing hands often is important.

Table 4. 24: Chi-Square between the Availability of a Continuous Source of Water and Acceptance of Public Health Measure

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	1.041	2	0.594
Likelihood Ratio	1.041	2	0.594
Cramer's V	0.0452		
N of Valid cases	510		

4.4.7 Association between Subjective norms and acceptance of Public Health measures

A chi-square statistic was used to determine the association between subjective norms and acceptance of public health measures. The results are presented in Table 4.25, which shows that at p=0.05, a statistically significant association exists between subjective norms and acceptance of public health measures ($\chi 2$=84.966, df=2, p<0.05). The Cramer's V showed that the two variables were strongly associated. Those households that have indicated that they are willing to accept the COVID-19 preventive measures are more likely to have a favorable belief in implementing the measures.

The study found that there is a strong positive belief in the implementation of public health preventive measures for COVID-19 control. According to the findings, 86% of the households had a positive belief in covering their faces with a hijab or facemask while going out, while only 8% were negative and 6% were undecided. 96% of the households were positive about the measure, while 2% were negative and another 2% were undecided. Handwashing was another measure that was widely reported to be regularly practiced. 96% of the households washed their hands before meals, while 4% didn't or weren't sure.

Table 4.25: Chi-Square between Subjective Norms and Acceptance of Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	84.9664	4	0.000
Likelihood Ratio	87.172	4	0.000
Cramer's V	0.289		
N of Valid cases	510		

4.4.8 Association between Attitude and Acceptance of Public Health measures

Table 4.26 presents the results of the chi-square statistics used to determine the association between subjective norms and acceptance of public health measures. The results show that at *p=0.05*, a statistically significant association exists between subjective norms and acceptance of public health measures ($\chi 2$=33.681, df=2, *p<0.05*). The likelihood ratio was also used to validate the Pearson Chi-square Test Statistics (used to test the significance of the variables for expected frequencies less than 5), which also shows that there exists a statistically significant association between the two variables ($p<0.05$). The Cramer's V also supported the significance of the association. The results showed a high level of societal acceptance of the practice of COVID-19 prevention methods, with 73% of households in Mombasa County having a positive attitude toward hand washing, 76% for face mask-wearing, and 75% citing prevention of COVID-19 prevention is essential. Study results showed that few people viewed the closure of nightclubs and bars as a practical step toward reducing the spread of the COVID-19 pandemic.

Table 4.26: Chi-Square between Attitude and Acceptance of Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	33.681	4	0.000
Likelihood Ratio	20.118	4	0.000
Cramer's V	0.1817		
N of Valid cases	510		

4.4.9 Association between perceiced controlled behavior and acceptance of public health measures

A chi-square test was conducted to determine the effect of perceived control behavior and acceptance of public health measures based on the composite score of Likert responses. The chi-square test results are presented in Table 4.27.

Table 4.27: Chi-Square between Control behavior and acceptance of public health measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	51.993	4	0.000
Likelihood Ratio	33.418	4	0.000
Cramer's V	0.2258		
N of Valid cases	510		

The chi-square results $\chi 2(df=4, N=510) = 51.993$, $p=0.000$, at $p=0.05$ level of significance. From these results, the chi-square *P-Value* is less than 0.05 was significant at $p<0.05$, indicating a statistically significant association between perceived control behavior and acceptance of public health measures. This finding implies that personal control behavior affects how one prefers to accept public measures to mitigate the COVID-19 pandemic. Preventive measures were assessed to be acceptable by 52% of those who reported high levels of personal control and by 28% of those who reported neutral levels of control. Only 5% expressed low levels of self-control, and 16% said they were in favor of the measures. The findings suggest that support for public health preventative measures increases when individuals' perceptions of their behavioral control improve.

Table 4.28: Linear Probability Model (LPM) regression analysis

Variables		**Acceptance of public health measures**
Normative Behavior[1]	Attitude	-.1052** (-1.93)
	Perceived	-.0906 (-1.61)
Gender[2]	Male	-.0306 (-0.61)
Education[3]	Primary	-.1065 (-0.84)
	Secondary	-.0831 (-0.64)

[1] The subjective category is used as reference category in the analysis.
[2] The female category has been used as the reference category.
[3] The nursery category has been used as the reference category.

	College	-.1358 (-0.98)
	University	.0245 (0.16)
Religion[4]	Hinduism	-.7875 (-1.36)
	Islam	-.3999 (-0.77)
	Christianity	-.4597 (-0.89)
Work[5]	Casual laborer	-.0044 (-0.08)
	Driver	.0484 (0.48)
	Mechanics	-.0988 (-0.79)
	Teacher	.0445 (0.44)
	Healthcare worker	-.0829 (-0.79)
Log age		-.1371** (-1.93)

[4] The pagan category has been used as reference category.
[5] The others category has been used as reference category.

Constant	1.6139*** (2.80)
Observations	510
R-Squared	0.0331
Model P-Value	0.0000

*** p<.01, ** p<.05, * p<.1

Using the subjective category of normative behavour as the reference category and running a Linear Probility Model (LPM) Regression Analysis, the results indicate that respondents with attitude and perceived contolled behaviours were less likely to accept public health measures implemented to control COVID-19 as compared to those with the subjective normative behaviour. Specifically, respondents with attitude normative behaviour were 10.52 per cent less likely to accept the public health measures while those with the perceived contolled behaviour were 9.06 per cent less likely to accept public health measures implemented to control COVID-19 compared to those with the subjective normative behaviour.

4.5 Association between normative behavior and adherence to public health measures for controlling COVID-19

The second goal is to examine the association between normative behavior and adherence to public health measures for controlling COVID-19 in Mombasa County. The Chi-square test was used to analyze the data to evaluate whether there was a significant relationship between normative behavior and adherence to public health interventions for controlling COVID-19, as well as whether or not there was a confounding variable. When evaluating the relationships' strength, a significance level of 5% was utilized.

4.5.1 Association between Age Groups and Adherence to Public Health Measures

The study examined the relationship between the age of respondents and adherence to public health measures to control COVID-19. The pearson chi-square value is 9.3431 with df =6, and the *P-Value* is 0.155. The *P-Value* computed is greater than α=0.05, which means the difference is not statistically significant. Hence there is no statistically significant relationship between the age of the respondents and the preference for adherence to the public measures in controlling the COVID-19 pandemic. The results are presented in Table 4.29

Table 4.29: Chi-Square test results between Age Groups and Adherence to Public Health Measures

Test Statistics	Value	df.	Asymptomatic.(2-sided)
Pearson Chi-Square	9.3431	6	0.155
Likelihood Ratio	9.0951	6	0.168
Cramer's V	0.0957		
N of Valid cases	510		

4.5.2 Association between Gender and Adherence to Public Health Measures

The study examined the relationship between the gender of respondents and the adherence to public health measures to control COVID-19. The pearson chi-square value is 12.14 with df =2, and the *P-Value* is *0.002*. *The P-Value* computed is less than α=0.05, which means the difference is statistically significant. Hence there is a significant relationship between the gender of the respondents and the preference for adherence to the public measures in controlling COVID-19. The results of the test are presented in Table 4.30.

Table 4.30: Chi-Square between Gender and Adherence to Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	12.14	2	0.002
Likelihood Ratio	12.26	2	0.002
Cramer's V	0.15		
N of Valid cases	510		

Males were more likely than females to express a positive attitude toward adhering to public health preventative measures (66% vs. 51%, respectively; M = 3.55 vs. SD = 0.94). These findings imply that males are more likely than females in a similar setting to follow public health precautions.

4.5.3 Association between Education and Adherence to Public Health Measures

The relationship between education level and preference for adherence to public measures is presented in Table 4.31. The test statistics showed a significant relationship between the education level of the respondents and the preference for adherence to public health measures for controlling COVID-19 ($\chi 2$=87.6278, df=8, $p<0.05$). The study's findings indicated that those with higher levels of education were more likely to follow public health guidelines. According to the data, compliance rates with the measures were greater among individuals with post-secondary education than among those with only a primary or pre-primary education. Favorable perceptions about following public health preventive measures were found among 82% of university graduates (M=3.75, SD=0.88), 68% of graduates (M=3.55, SD=0.84), and 69% of high school graduates

(M=3.56, SD=0.85). The numbers for those who progressed to primary school were 38% (M=3.36, SD=0.87), while those who stayed in nursery school were 64% (M=3.5, SD=1.54). The results show that people are more likely to support public health preventive measures when their level of education increases.

Table 4.31: Chi-Square between Education and Adherence to Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	87.627	8	0.000
Likelihood Ratio	69.4218	8	0.000
Cramer's V	0.2931		
N of Valid cases	510		

4.5.4 Association between Religion and Adherence to Public Health Measures

The study examined the relationship between the religion of practice of respondents and the adherence to public health measures to control COVID-19. The pearson chi-square value is 90.657 with df =6, and the *P-Value* is *0.00001*. The P-Value computed is less than α=0.05, which means the difference is statistically significant. Hence there is a significant relationship between the religion of the respondents and the preference for adherence to the public measures in controlling COVID-19. The results of the test are presented in Table 4.32.

Table 4.32: Chi-Square between Religion and Adherence to Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	90.657	6	0.00001

Likelihood Ratio	29.255	6	0.00001
Cramer’s V	0.2981		
N of Valid cases	510		

Findings indicated that those who practiced Hinduism were more likely to adhere to public health preventive measures than their counterparts who practiced Christianity (M = 3.55, SD = 0.99) and Islam (M = 3.45, SD = 0.89). According to the findings, those who practice Hinduism have a mean score of 4.18, with a standard deviation of 0.21.

4.5.5 Association between Profession and Adherence to Public Health Measures

The results presented in table 4.33 showed that at a significant level of $p=0.05$, the chi-square statistics showed that the respondent's profession was statistically associated with a preference for adherence to public health measures (χ=45.11, df=8, $p<0.05$). However, the relationship is weak, as indicated by Cramer's V (V=0.2314). According to the findings, healthcare workers were more likely to adhere to the public health preventive measures than casual laborers (M=3.41, SD=1.0), drivers (M=3.4, SD=0.86), mechanics (M=3.67, SD0.89), teachers (M=3.65, SD=0.78), and other professions (M=3.52, SD=0.82). The likelihood that healthcare workers adhere to public health preventive measures is indicated by a mean of 3.7 and a standard deviation of 0.9.

Table 4. 33: Chi-Square between Profession and Adherence to Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	54.623	10	0.000
Likelihood Ratio	58.7107	10	0.000
Cramer’s V	0.2314		
N of Valid cases	510		

4.5.6 Association between the Availability of Continuous Source of Water and Adherence to Public Health Measures

Table 4.34 highlights the Chi-square statistics used to check for the association between the water source and the preference for adherence to public health measures. The results show that at *p=0.05*, there is statistical significance between preference for adherence to public health measures and water source ($\chi 2$=31.79, df=2, *p=0.005*). Study results showed that people who don't have a steady water supply were more likely to follow public health guidelines than those who have (M=3.40, SD=1.02). The findings suggest that variations in water access are a major determinant of how well people follow public health precautions.

Table 4.34: Chi-Square between the Availability of Continuous Source of Water and Adherence to Public Health Measures

Test Statistics	**Value**	**df.**	**Asymptotic Sig.(2-sided)**
Pearson Chi-Square	10.5789	2	0.005
Likelihood Ratio	10.9837	2	0.004
Cramer's V	0.1440		
N of Valid cases	510		

4.5.7 Association between Subjective Norms and Adherence to Public Health Measures

A chi-square statistic was used to determine the association between subjective norms and adherence to public health measures. The results were presented in Table 4.35, which showed that at *p=0.05*, a statistically significant association exists between subjective norms and adherence to public health measures ($\chi 2$=64.778, df=4, $p<0.05$). Cramer's V shows that the two variables are strongly associated. According to the findings, 39% of those who had a favorable belief towards

the preventive measures also had a positive approach towards adherence to the public health preventive measures, whereas 59% of those who had a neutral orientation also had a positive orientation, which was only 22%. The results of the study indicated that individuals who had a positive belief toward the measures were more likely to adhere to the measures than individuals who were either undecided or non-adherent to the measures.

Table 4.35: Chi-Square between Subjective Norms and Adherence to Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	64.778	4	0.000
Likelihood Ratio	68.297	4	0.000
Cramer's V	0.2520		
N of Valid cases	510		

4.5.8 Association between Attitude and Adherence to Public Health Measures

Table 4.36 presents the results of the Chi-square statistics used to determine the association between attitude and adherence to public health measures. The results show that at $p=0.05$, a statistically significant association exists between attitude and adherence to public health measures ($\chi 2=70.239$, df=4, $p<0.05$). The likelihood ratio was also used to validate the pearson chi-square test statistics (used to test the significance of the variables for expected frequencies less than 5), which also shows that there exists a statistically significant association between the two variables ($p<0.05$). The Cramer's V also supported the significance of the association, according to the findings, a total of 64% of the respondents who had a positive attitude towards the measures, 65%

reported having a positive orientation towards the measures, whereas 30% of those who had a neutral attitude to the measure, 49% reported having a positive orientation towards the measures. The findings show that those with positive attitudes towards the measures were more likely to adhere to the public health preventive measures.

Table 4.36: Chi-Square between Attitude and Adherence to Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	70.239	4	0.000
Likelihood Ratio	43.798	4	0.000
Cramer's V	0.2624		
No. of Valid cases	510		

4.5.9 Association between Perceived Controlled Behavior and Adherence to Public Health Measures

A chi-square test was conducted to determine the effect of perceived control behavior and acceptance of public health measures based on the composite score of Likert responses. The chi-square test results are presented in Table 4.37.

Table 4.37: Chi-Square between Perceived Controlled Behavior and Adherence to Public Health Measures

Test Statistics	Value	df.	Asymptotic Sig.(2-sided)
Pearson Chi-Square	96.1414	4	0.000
Likelihood Ratio	54.321	4	0.000

Cramer's V	0.307
No. of valid cases	510

The chi-square results $\chi 2(df=4, N=510) = 96.1414$, $p=0.000$, at $p=0.05$ level of significance. From these results, the chi-square *P-Value* is less than *0.05* was significant at $p<0.05$, indicating a statistically significant association between perceived control behavior and adherence to public health measures. This finding implied that personal control behavior affected how one prefers to adhere to the public measures aimed at mitigating COVID-19.

Table 4.38: Linear Probability Model (LPM) Regression Analysis

Variables		**Adherence to public health measures**
Normative Behavior[6]	Attitude	-.0974* (-1.82)
	Perceived	-.0806 (-1.45)
Gender[7]	Male	-.0481 (-0.98)
Education[8]	Primary	-.1395 (-1.11)
	Secondary	-.0817 (-0.64)

[6] The subjective category is used as reference category in the analysis.
[7] The female category has been used as the reference category.
[8] The nursery category has been used as the reference category.

	College	-.0786 (-0.57)
	University	.0719 (0.49)
Religion[9]	Hinduism	-.7617 (-1.33)
	Islam	-.3083 (-0.60)
	Christianity	-.3805 (-0.75)
Work[10]	Casual laborer	.0347 (0.66)
	Driver	.0864 (0.86)
	Mechanics	-.1479 (-1.19)
	Teacher	.0364 (0.36)
	Healthcare worker	-.1261 (-1.22)
Log age		-.1582** (-2.26)

[9] The pagan category has been used as reference category.
[10] The others category has been used as reference category.

Constant	1.6446*** (2.89)
Observations	510
R-Squared	0.0448
Model P-Value	0.0000

Using the subjective category of normative behaviour as the reference category and running a Linear Probability Model (LPM) Regression Analysis with adherence as the dependent variable, the results further indicate that respondents with the attitude and perceived contolled behaviours were less likely to adhere to public health measures implemented to control COVID-19. Specifically, respondents with the attitude were 9.74 per cent less likely to adhere to publich health measures while those with the perceived contolled behaviour were 8.06 per cent less likely to adhere to the control measures implemented to control COVID-19 compared to those with the subjective normative behaviour.

4.6 Association between acceptance and adherence of public health measures

Acceptance and adherence to the preventive measures were evaluated using an 7-item personality scale. Table 4.39 below demonstrates chi square test statistics for the association between acceptanace and adherence of public health measures for COVID-19.

Table 4.39: Association between acceptance and adherence to public health measures

Preference	**Acceptance**		**Adherence**		**Test statistic**		
Preventive measure	**Mean**	**SD**	**Mean**	**SD**	**χ^2**	**Crammer's V**	***p-value***
Handwashing	4.08	0.84	4.06	0.83	1200	0.767	0.00
Necessary COVID-19 prevention	4.12	0.8	4.09	0.83	833	0.639	0.00

Paying when coughing/Sneezing	4.25	0.64	4.21	0.66	728	0.598	0.00
Mask wear when going out	3.85	0.94	3.85	0.94	1300	0.793	0.00
Meals with non-family members on the same table	3	1.04	3.05	1.02	1100	1.00	0.00
Believe on friends for protection	2.53	1.07	2.53	1.07	1000	1.00	0.00
Believe on vaccines for controlling a population	2.66	1.27	2.64	1.26	1300	1.00	0.00
Total	**3.5**	**0.94**	**3.49**	**0.94**			

The results of the chi-square test indicated that the association between an individual accepting handwashing as a preventive strategy and subsequently adhering to the measure is statistically significant ($\chi 2=1200$, df=16, $p<0.05$). According to the findings, participants agreed to accept handwashing on a regular basis as a preventive measure (M = 4.08, SD = 0.84) and almost on an equal measure agreed to adhere to the measure (M = 4.06, SD = 0.83).

There exists a statistically significant association between acceptance of necessary COVID-19 prevention and adherence to the measure ($\chi 2=833$, df=16, $p<0.05$). Most of the participants agreed to put the measure into practice, and the measure was put into place to stop COVID-19.

At a 5% level of significance, the findings in Table 4.39 also show a statistically significant association between the acceptance and adherence of paying attention to how one sneezes in public, wearing masks while going out, believing that friends will protect you from contracting COVID-19, not taking precautions while eating meals with non-family members at the same table, and believing that vaccines are used to control a population. However, participants remained neutral on acceptance of having meals with non-family members at the same table (M = 3.0, SD = 1.05) and adherence to the measure (M = 3.05, SD = 1.02). Similar findings were made regarding the acceptance and adherence of belief in friends for protection and belief in vaccines to control a

population, in which participants were neutral on whether or not they preferred to accept and adhere to the measure.

Overall, the findings show that there exists a statistically significant association between the acceptance and adherence of public health preventive measures. Due to its rapid spread, high transmissibility, and high fatality rate among the susceptible population, COVID-19 generated a significant degree of terror. The general public became familiar with COVID-19 infection prevention techniques, which were widely disseminated in the news, in print, and on social media. Together with efforts made by the Ministry of Health, this increased the acceptance and adherence of public health preventive measures by the general public.

Table 3.40: Association between normative behaviour, acceptance, and adherence

Normative Behavior	**Acceptance**				**Adherence**			
	Degrees of Freedom (DF)	*Chi-Square Statistic (χ^2)*	*P-value*	*Cramer's V*	*Degrees of Freedom (DF)*	*Chi-Square Statistic (χ^2*	*P-value*	*Cramer's V*
	2	3.8368	0.047	0.0867	2	2.8178	0.044	0.0743

The evidence indicates that normative behaviour has a positive association with acceptance (χ^2=3.8368, P=0.047) and adherence (χ^2=2.8178, P=0.0743). The implication is that normative is a key determinant of whether individuals accept and adhere to public health measures implemented to control COVID-19.

4.7 Diagnostic tests for Multinomial Logit

In a preliminary examination, potential multicollinearity among variables was examined and determined to have no potential impact on model estimations. The maximum pairwise correlation was 0.45. However, multicollinearity becomes a significant concern when the pairwise correlation among explanatory variables exceeds 0.5(Donath et al., 2012). Variance inflation factor (VIF) analysis revealed no problem, as none of the single-variable VIFs exceeded 8(Marcoulides & Raykov, 2018).

To test for the model's fitness for the acceptance of preventive measures, the likelihood ratio $\chi 2$(Chi2) of 204.45 with a *P-Value <0.05* tells us that our model fits significantly better than an empty model, i.e., with no predictors. In addition, the probability of pearson $\chi 2$(Chi2) of 1.00 and that of deviance of $\chi 2$ of 1.000 confirmed that the acceptance of preventive measures model models fit well with the data.

For the case of adherence to preventive measures, the likelihood ratio $\chi 2$(Chi2) of 161.252 with a *P-Value <0.05* tells us that our model fits as a whole significantly better than an empty model, i.e., with no predictors. In addition, the probability of pearson $\chi 2$(Chi2) of 1.00 and that of deviance of $\chi 2$ of 1.000 confirmed that the adherence to preventive measures models fit well with the data.

4.8 A Multinomial Logit Regression model for the factors that influence the Acceptance and Adherence to Public Health Measures aimed at the public to control the COVID-19 pandemic in Mombasa County

In order to achieve objective three of the study that determined the factors that influenced the respondent's behavior to accept and adhere to the public health measures for controlling COVID-19 in Mombasa County, this study conducted a multinomial logit model. There were two

dependent variables; acceptance of public health measures and adherence to public health measures. Two models will be fitted for the two dependent variables with the independent variables. The base category selected in both models was those who were neutral to the measures.

4.8.1 Acceptance of public health measures and age groups, education level, gender, religion, profession, water-source, residence, subjective norms, attitudes and perceived control behavior

The results presented in Table 4.41 below presents the likelihood ratio test results for the model which shows that only 5 of the 10independent variables are statistically significant at the $p<0.05$ level.

Table 4.41:Likelihood ratio test for acceptance to public health measures model

	model fitting criteria	likelihood ratio tests		
Effect	-2 Log Likelihood of reduced model	chi-square	df	Sig.
Intercept	596.58	10.12	2	0.006**
Age	596.23	9.77	2	0.008**
Gender	592.08	5.62	2	0.06
Education	594.23	7.77	2	0.021**
Religion	591.46	5	2	0.08
Work	590.51	4.05	2	0.13
Water source	586.98	0.52	2	0.77
Residence	601.28	14.82	2	0.001**
Attitude	607.56	21.09	2	0.000**
Subjective Norm	648.88	62.42	2	0.000**
Perceived controlled behavior	591.97	5.51	2	0.06

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the finalmodel. The null hypothesis is that all parameters of that effect are 0.

$p < .05$, df = 2, n =510

Age ($\chi2$=596), education ($\chi2$=594.46), residence ($\chi2$=601.28), attitude ($\chi2$=607.56), and subjective norms ($\chi2$=648.88) were all significant in the model's ability to predict adoption of the public health preventative measures. We found no statistically significant effects of gender, religion,

occupation, water source, or perceived control behavior on the model's capacity to predict uptake of public health preventative measures at the $p<0.05$ level. It's also worth noting that Table 4.42 only provides an estimate for the overall model improvement, not for the specific effects of variables in each given set of comparisons.

Table 4.42:Regression results for acceptance of public health measures model

Parameter Estimates

Acceptance[a]		*B*	Std. Error	Wald	Sig.	*Exp(B)*
Non-acceptance	Intercept	8.59	7.711	1.241	0.265	
	Age	0.177	0.112	2.501	0.114	1.194
	Gender	-21.15	9346.86	0	0.998	0.000
	Education	-1.882	1.882	0.999	0.318	0.152
	Religion	-20.65	0.000	.	.	0.000
	Profession	-1.911	1.776	1.158	0.282	0.148
	Water source	1.023	2.002	0.261	0.609	2.781
	Residence	-21.17	9720.65	0	0.998	0.000
	Attitude	5.459	2.13	6.573	0.01	234.978
	Subjective norms	-1.06	1.277	0.69	0.406	0.346
	Perceived controlled behavior	0.177	1.406	0.016	0.9	1.194
Acceptance	Intercept	-2.115	0.673	9.871	0.002	
	Age	-0.021	0.008	6.294	0.012	0.980
	Gender	0.122	0.213	0.33	0.566	1.130
	Education	0.272	0.108	6.309	0.012	1.313
	Religion	0.208	0.213	0.955	0.328	1.231
	Profession	0.075	0.065	1.316	0.251	1.078
	Water source	-0.109	0.217	0.252	0.616	0.897
	Residence	0.652	0.215	9.17	0.002	1.920
	Attitude	-0.608	0.212	8.256	0.004	0.545
	Subjective norms	0.813	0.108	56.865	0.000	2.255
	Perceived controlled behavior	0.294	0.126	5.425	0.020	1.341

a. The reference category is: Neutral.

The results from Table 4.42 show the results of the multinomial logit model for the different categories of acceptance of the preventive measures towards control of COVID-19. The results

generally show that gender, religion, profession, and water source were not significant in all categories for determining how an individual prefers to accept the practice of COVID-19 preventive measures.

The findings from Table 4.42 shows that age was only significant in the case of those who accepted the public health measures for COVID-19. The variable age had a negative value with *p=0.012*, odd ratio=0.98. The odd ratio of 0.98 implies that if there is a unit increase in age, the odds of acceptance of public health measures for controlling COVID-19 decrease by 0.98. These results are consistent with the research findings by Pasion et al. (2020), who discovered that people's prophylactic behavior decreases as they become older and that the risk of perception of the elderly tend to be lower than those of the young. Specifically, older persons appear to engage in more routine habits that were severely discouraged during the quarantine, and fewer health measures that are recommended to prevent contamination. However, the risk-taking behavior of older persons cannot be attributed solely to the absence of active household management since these individuals also exhibited a marked decrease in the use of prevenive health measures aimed at preventing disease transmission (e.g., washing the hands or covering the nose and the mouth when coughing or sneezing). In the past SARS (Wong and Tang, 2005) and H1N1 (Rubin et al., 2009) pandemics, where the elderly were likewise at a greater risk, the older population was less inclined to follow protective guidelines.

Another study in Ghana on compliance with COVID- 19 preventive measures and associated factors among pregnant women reported that for every one unit increase in a woman's age, there was a 10% increase in the probability that she would washed her hands and or used hand sanitizer (Adjusted odds Ratio: 1.10, 95% CI: 1.03, 1.16). The findings showed that the coefficient for education was a significant predictor of the acceptance of preventive measures for controlling

COVID-19 at a 5% significance (B=0.272, *p=0.012*, odd ratio=1.13). The coefficient had a positive sign which implies that an increase in the education level will increase the odds of an individual to accept the public health preventive measures for mitigating COVID-19 by 1.13 or 13% (1-1.13=13). A corroborating study by da Silva et al. (2021) found a strong positive relationship between education and health knowledge outcome: the higher the level of education, the higher the health knowledge regarding COVID-19. According to Apanga & Kumbeni (2021) research on COVID-19 preventive measures and associated factors in Ghana, the likelihood that a woman will wash her hands or use hand sanitizer increases by 10% for every 1-unit increase in her age. This research also demonstrates that people with higher levels of education are more likely to support public health preventive initiatives. A whopping 100% of college-educated people were found to have good hand-washing practices, 98% of secondary-educated people, and 94% of high-school-educated people. In comparison, the approval percentage of individuals with a nursery level education was 78%, while those with a primary level education were at 64%. The findings also show that the individual's residence had a significant predictive Value for acceptance of the preventive measures and not significant non-acceptance. The coefficient for residence had a positive Value of 0.65 (B=0.65, odds ratio=1.92, *p=0.05*). The odds ratio of 1.92 implies that when the residence of an individual increases by 1 unit will lead to an increase in the acceptance rate by 92% (1-1.92=0.92). According to the findings of Tinson & Clair (2020), higher-quality housing is essential for human well-being.

Furthermore, the COVID-19 recovery showed that for owner-occupiers and private renters, residing in low-quality dwellings is associated with lower self-rated health. This study's findings indicated that most respondents lived in rented dwellings (56%), with 79% of them living in

common residences. In crowded situations, where more than six people per home are usually habited, it can be challenging to implement public health preventive measures.

The findings showed that the respondent's attitude was a significant factor for both acceptance and non-acceptance of the public health measures for COVID-19 at a 5% significance level. The acceptance of the measures displayed a negative coefficient (B=-0.608, Odds ratio=0.545, p=0.004). This study's findings implied that if there was a unit change in the attitude of the individual accepting the preventive measures for controlling COVID-19, the odds of an individual who is undecided turning to accepting the measures is decreased by 45.5% (1-0.545=0.455), an indication that it will be that difficult to convert an individual who is undecided to the measures. On the other hand, the non-acceptance of the measures displayed a positive coefficient of attitude towards the measures (B=5.459, Odds ratio=234.978, *p=0.01*). The category had a very large odds ratio which implied that when there is a unit change in attitude, the odds of an individual converting to the neutral category is increased by 234.978. Since the statements for measuring attitude were all negative, there is a high acceptance of the COVID-19 measures hence the positive predictive nature of the coefficient. A study on public acceptability of vaccination in China and Russia reported high attitudes toward vaccination to mitigate COVID-19, clearly indicating a higher acceptance level (Lazarus et al., 2020). The findings are similar to our study findings showing participants' high acceptability of the measures with vaccination included.

The findings also showed that the coefficient for subjective norms was significant for the case of acceptance of the measures but not significant for the non-acceptance. The variable displayed a positive coefficient of 0.813, *p=0.000,* and Odds ratio=2.255. The coefficient had a positive sign which implied that a one unit change in the subjective norm of an individual would increase the odds of the individual accepting the preventive measures by 2.255, and an individual will choose

to agree/strongly agree to the measure over being neutral. The findings are supported by Rad et al. (2022) in their study, which found that subjective norms had a positive relationship with individual acceptability of being vaccinated to control COVID-19 (B=0.265, $p<0.001$).

Perceived control behavior was another variable with a significant predictive Value for acceptance of the public health measures at a significance level of $p=0.05$. The variable displayed a B=0.294, Odds ratio=1.341, $p=0.02$. The coefficient of the variable is positive, which indicates that a one-unit increase in perceived control behavior of an individual will increase the odds of the individual accepting the public health preventive measures by 1.131 than those undecided. From the study's findings, the proportion of individuals who had a high perceived controlled behavior (66%) was higher than those who had low positive controlled behavior (4.9%) or perceived neutral control behavior (28.5%). A study by Aschwanden et al. (2021) showed that perceived control behavior, attitude, and subjective norms had a significant independent association with each preventive behavior of COVID-19. The models fitted are given below:

$$\ln\left[\frac{p(y=Negative)}{p(y=Neutral)}\right] = 8.59 + 0.177Age - 21.15Gender - 1.82Education - 20.65Religion - 1.911Profession + 1.023Water_{Source} - 21.17Residence + 5.46Attitude - 1.06Subjective_{norms} + 0.177Control\ behaviour$$

$$\ln\left[\frac{p(y=positive)}{p(y=Neutral)}\right] = -2.115 - 0.021Age + 0.122Gender + 0.272Education + 0.208Religion + 0.075Profession - 0.109Water_{Source} + 0.652Residence - 0.608Attitude + 0.813Subjective_{norms} + 0.294Control\ behaviour$$

4.8.2 Adherence of public health measures and age groups, education level, gender, religion, profession, water-source, residence, subjective norms, attitudes and perceived control behavior.

The multinomial logit model was fitted to determine the influence of normative behavior and the co-founding variables on adherence to COVID-19 preventive measures. The results in Table 4.43 below present the likelihood ratio test results for the model.

Table 4. 43: Likelihood ratio test for adherence to public health measures model

	model fitting criteria	likelihood ratio tests		
Effect	-2 Log Likelihood of reduced model	Chi-square	df	Sig.
Intercept	590.88	9.36	2	0.01
Age	584.73	3.21	2	0.20
Gender	582.56	1.03	2	0.60
Education	597.18	15.66	2	0.000*
Religion	586.52	5	2	0.08
Profession	596.69	15.17	2	0.001**
Water source	588.3	6.78	2	0.034**
Residence	600.96	19.43	2	0.000**
Attitude	599.41	17.89	2	0.000**
Subjective Norm	619.5	37.97	2	0.000**
Perceived Controlled Behaviour	590.34	8.82	2	0.012**

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final

model. The null hypothesis is that all parameters of that effect are 0.$p < .05$, df = 2, n =510

As demonstrated in table 4.43 above, only 7 of the 10 independent variables have a significant effect on the model at $p<0.05$ level. Variables with significant effect on the model's ability to predict household's adherence of the public health preventive measures were education ($\chi2=15.66$), residence ($\chi2=19.43$), profession ($\chi2=15.17$), water source ($\chi2=6.78$), attitude ($\chi2=17.89$), and subjective norms ($\chi2=37.97$) and perceived controlled behavior ($\chi2=8.82$). On the

other hand age, gender and religion had no predictive significant effect on the model's ability to predict adherence of the public health preventive measures.

Table 4.44: Regression results for adherence to public health measures model

Parameter Estimates

Adherence[a]		*B*	Std. error	Sig.	Exp *(B)*
Non-adherence	Intercept	1.986	5.078	0.696	
	Gender	0.030	1.042	0.977	1.030
	Education	-1.450	0.851	0.09	0.236
	Religion	0.825	1.025	0.421	2.282
	Work	-1.670	1.662	0.316	0.189
	Water source	-1.400	1.486	0.346	0.247
	Residence	-0.380	1.3	0.773	0.687
	Subjective norm	0.100	0.601	0.868	1.105
	Attitude	0.741	0.849	0.383	2.099
	Perceived controlled behavior	-0.500	0.545	0.359	0.606
	Age	0.001	0.05	0.978	1.001
Adherence	Intercept	-2.070	0.697	0.003	
	Age	-0.020	0.009	0.075	0.985
	Gender	0.224	0.221	0.310	1.252
	Education	0.365	0.117	0.002	1.441
	Religion	0.480	0.225	0.033	1.615
	Profession	0.223	0.068	0.001	1.250
	Water source	-0.550	0.224	0.014	0.577
	Residence	0.959	0.224	0.000	2.609
	Subjective norm	0.695	0.118	0.000	2.003
	Attitude	-0.900	0.235	0.000	0.406
	Perceived controlled behavior	0.346	0.128	0.007	1.414

a. The reference category is: Neutral.

The results from Table 4.44 presents the multinomial logit regression model for the categories of adherence of households to the COVID-19 preventive measures. Generally, Age and gender were not significant in all categories in determining the influence of the orientation of an individual to

adhere to the preventative measures. More specifically, no variable had a significant predictive Value of the non-adherence of the preventive measures. Further, adherence to the measures, religion, profession, water source, residence, subjective norms, attitude, and perceived controlled behavior had predictive importance to the model at 5% significance.

Findings show that on adherence to the preventive measures, an individual's education level has positive predictive importance at a 5% significance level. The results displayed show that B=0.365, Odds ratio=1.441, *p=0.02*. The odds ratio of 1.441 suggests that a unit increase in an individual's education will increase the likelihood of individual adherence to the preventive measures of COVID-19 by 44.1% (1-1.441=0.441) as compared to those of the reference category. The findings are similar to the findings in Oromia state in Ethiopia, which found that the odds of a good level of adherence to COVID-19 preventive measures increase with an increase in education level (Abeya et al., 2021). Practically, education increases awareness of the health benefit of the preventive measures of an individual or even those around them. The findings of this study corroborate with the study of Apanga & Kumbeni (2021), whose findings showed that the odds of practicing handwashing or hand sanitizing were five times more likely among women who had a secondary or tertiary level of education compared to the odds of practicing handwashing or hand sanitizing among women who had no formal education (Adjusted odds ratio: 5.04, 95% CI: 2.42, 10.50).

The results show that the religion of an individual was significant in predicting the individual adherence to the preventive measures, with a positive coefficient of B=0.480, Odds ratio=1.615, and *p=0.033* showing that it was significant at a 5% level of significance. The odds ratio of 1.039 implies that a unit increase in religion will increase an individual's likelihood of positively adhering to the preventive measures by 61.5% (1-1.615=0.615). Some of the recommended preventative

behaviors may be incongruent with religious traditions; therefore, it seems counterintuitive that religious people would be more likely to embrace them. However, a study by Munthan et al. (2022) showed that religion positively impacts community adherence to preventive measures for controlling COVDI-19 infection, which is consistent with the findings of this study. The results also show that an individual's profession significantly has positive predictive importance on adherence to COVID-19 preventive measures. The coefficient of religion B=0.223, Odds ratio=1.250, and *p=0.001* are significant at a 5% significance level. The odds ratio of 1.250 indicated that a unit increase in the profession would increase the likelihood of individual adherence to the preventive measures by 25%(1-1.250=0.250) compared to the neutral category. The findings of this study are consistent with that of Abeya et al. (2021), whose findings show that occupation of an individual increase the level of adherence to COVID-19 preventive measures.

The results show that although it has a negative coefficient, the water source has significant predictive importance on adherence to COVID-19 preventive measures (B=-0.550, Odds ratio=0.577, *p=0.014*). The findings imply that a unit change in the water source will decrease the likelihood of an individual adhering to the preventive measures by 42.3% (1-0.577=0.423) compared to one choosing a neutral category. The majority of the households had no continuous access to water within their households which means they were dependent on alternative sources of water. This negatively affected households' ability to adhere to protective public health measures during the COVID-19 pandemic.

Findings also show that residence was significantly associated with adherence to the preventive measures of COVID-19. A unit change in residence of an individual will increase the likelihood of the individual practicing adherence to the protective COVID-19 measures by 2.609 than the neutral category (B=0.959, Odds ratio=2.609, *p<0.05*). The study findings showed that most

respondents (56.2%) reside in rentals, with 78% residing in communal houses. Since social isolation is impractical in shared dwellings, residents are more likely to take other precautions, such as washing their hands frequently and wearing face masks, against the spread of the virus.

Subjective norm is significantly associated with adherence to public health preventive measures. The variable had a positive coefficient (B=0.695, Odds ratio=2.003, $p<0.005$), which means that a unit increase in a variable subjective norms increases the likelihood of an individual to practice adherence of the preventive measures than those who are neutral to the measures by 2.003. This study corroborates a study by Akther & Nur (2022) that shows that subjective norms and self-efficacy are significant predictors of COVID-19 measures, especially on vaccination. In addition, the study revealed that the subjective norms that had the most impact on responders were when friends and family members responded Positively to vaccination. Individuals with a positive view of COVID-19 vaccinations would encourage their friends, family, and community. Another study in Chile corroborates this study's findings and indicates that the opinions and actions of close friends and family members significantly influence the likelihood that young people will engage in preventative behaviors against COVID-19 (Gerber et al., 2021).

The respondent's attitude also shows its significance at a 5% level of significance in predicting a practice of adherence to preventive measuring for COVID-19. The model's attitude coefficient has a negative Value of 0.902, an odds ratio of 0.406, and $p<0.005$. The odds ratio of 0.406 implies a unit change in the statement describing attitude decreased the likelihood of an individual to practice adherence to the COVID-19 preventive measures by 40.6% (1-0.406=0.594) compared to those who are neutral to the measures.

On the other hand, perceived controlled behavior had significant predictive importance on the practice of adherence to COVID-19 preventive measures. At a 5% significance level, the variable

displayed a positive coefficient which implies a positive effect on the model. Perceived controlled behavior displayed (*B*=0.346, Odds ratio=1.414, p=0.007) implies that a unit change in behavior of an individual increases the likelihood of practicing adherence to the measures by 41.4% (1-1.414=0.414) as compared to the neutral category. This finding is in line with Li et al. (2021), who conducted an empirical study based on the extended theory of planned behavior to determine what factors influence COVID-19 preventive behaviors among university students in Beijing, China. They found that the more positive students' attitudes and subjective norms are toward COVID-19 preventive behavior, the stronger the perceived behavioral control and the more likely students are to engage in it. The equations models fitted are as below.

$$\ln\left[\frac{p(y = Negative)}{p(y = Neutral)}\right] = 1.986 + 0.001Age + 0.03Gender - 1.45Education + 0.825Religion - 1.67Profession - 1.4Water_{Source} - 0.38Residence + 0.741Attitude + 0.1Subjective_{norms} - 0.5Control\ behaviour$$

$$\ln\left[\frac{p(y = positive)}{p(y = Neutral)}\right] = -2.07 - 0.02Age + 0.224Gender + 0.365Education + 0.48Religion + 0.223Profession - 0.55Water_{Source} + 0.959Residence - 0.9Attitude + 0.695Subjective_{norms} + 0.346Control\ behaviour$$

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study aimed to explore the association between normative behaviors, acceptance, and adherence to COVID-19 disease public health measures among communities in Mombasa. This chapter discusses the demographic characteristics of the households and the key findings according to the study's objectives regarding the relationship between normative behavior with acceptance and adherence to public health measures. The confounding variables' results are also discussed, and conclusions and recommendations.

5.2 Summary

Below is a summary of the significant findings obtained in the study to establish the association between normative behavior, acceptance, and adherence to public health measures during the COVID-19 pandemic in Mombasa County, Kenya.

i. The results indicated that respondents with attitude and perceived contolled behaviours were less likely to accept public health measures implemented to control COVID-19 as compared to those with the subjective normative behaviour. Specifically, respondents with

attitude normative behaviour were 10.52% cent less likely to accept the public health measures while those with the perceived contolled behaviour were 9.06% less likely to accept public health measures implemented to control COVID-19 compared to those with the subjective normative behaviour.

ii. The results further demonstrated that respondents with the attitude and perceived contolled behaviours were less likely to adhere to public health measures implemented to control COVID-19. Specifically, respondents with the attitude were 9.74% less likely to adhere to publich health measures while those with the perceived contolled behaviour were 8.06% less likely to adhere to the control measures implemented to control COVID-19 compared to those with the subjective normative behaviour.

iii. Normative behaviour has a positive association with acceptance ($\chi 2$=3.8368, P=0.047) and adherence ($\chi 2$=2.8178, P=0.0743) and the implication is that normative is a key determinant of whether individuals accept and adhere to public health measures implemented to control COVID-19.

iv. The results revealed that 63% of the respondents practice accepting public health measures to control COVID-19. In addition, paying attention to how one sneezes or coughs in public was the best reported preventive measure, with 95% of the respondents reporting acceptance. Conversely, relying on friends for protection against COVID-19 infection was the least acceptable measure, with only 23% showing acceptance of the measure and 59% showing non-acceptance.

v. Gender was significantly associated with acceptance to be public health measures ($\chi 2$=0.013, *p=0.013*). Males were more likely than females to have an unfavorable

orientation towards the preventive measures, with 30% of the males skewed towards non-acceptance of the measures while only 23% of the females had a negative orientation.

vi. Other confounding variables, including age group, religion, profession, and education level, were found to have a statistically significant association with acceptance of public preventive measures toward COVID-19 ($\chi2=16.91$, $p=0.01$), ($\chi2=113.41$, $p=0.000$), ($\chi2=31.79$, $p=0.000$), ($\chi2=87.67$, $p=0.000$) respectively. There was no statistically significant association between continuous water sources with acceptance of public health measures ($\chi2=1.041$, $p=0.594$).

vii. The results show that 53% of the respondents had a positive attitude to the measures, with 73% favoring handwashing, 76% facemasks, and 53% favoring stringent measures towards the public. However, half of the respondents (50%) highly unfavored restrictions on gatherings. The Chi-square test found that attitude significantly correlates with acceptance of public preventive health measures ($\chi2=33.68$, $p<0.05$).

viii. 86% of respondents had a positive belief about covering their faces with Hijab when going out (Mean=4.0, SD=0.79), 38% were happy about eating with friends and strangers at the same table, whereas 46% were Negative (Mean=2.93, SD=1.05). Further, 47% disagreed with "I can't miss weddings or funerals" (Mean=2.77, SD=0.99), while 36% of respondents had an unfavorable view of praying in congregation, whereas 45% did (Mean=3.1, SD=1.06). Overall, 56% of participants believed positively in the statements evaluating subjective COVID-19 preventive practices (Mean=3.4, SD=0.88).

ix. The Chi-square test shows that there is a significant association between subjective norms and perceived controlled behavior with acceptance of public health measures ($\chi2=84.966$, $p<0.05$) and ($\chi2=51.993$, $p<0.05$), respectively.

x. The majority of the respondents agreed to adherence to the preventive measures for mitigating COVID-19 (Mean=3.49, SD=0.94), with paying attention to how one sneezes or coughs in public being the most preferred measure (Mean=4.21, SD=0.66) and relying on friends for protecting was the least preferred measure (Mean=2.53, SD=1.07).

xi. The association between age and adherence to public health interventions for the prevention of COVID-19 was not statistically significant, with a Value of $\chi 2=9.3431$ and a *P-Value* of *0.155*. This suggests that individuals of all age groupings will most likely observe adherence to the measures.

xii. There was a statistically significant relationship between gender and adherence to public health measures, with a chi-square value of 12.136 and a significance level of 0.002. This suggests that gender played an important role in determining which gender was more likely to adhere to the preventive measures.

xiii. The chi square test showed that there was a significant relationship between the level of education and adherence to public health measures, $\chi^2=87.62$, $p<0.05$. This finding shows that respondents with higher levels of education are more likely to adhere to the public health measures.

xiv. There was a statistical significance between religion and adherence to public health preventive measures, $\chi 2=90.657$, $p<0.05$. This indicates that religion is a determinant of adherence to the COVID-19 measures.

xv. The results also show a statistically significant association between an individual's profession and water source with the practice of adherence to public health measures, $\chi 2=54.623$, $p<0.05$, $\chi 2=10.578$, and $p<0.05$, respectively.

xvi. The association between subjective norms and adherence to public health was statistically significant at $\alpha=0.05$, $\chi2=64.77$, *p=0.000*.

xvii. The chi-square test of association showed a statistically significant relationship between attitude towards preventive behavior and adherence to the public preventive measures for controlling COVID-19, $\chi2=70.239$, *p<0.05*, which implies that the individual's attitude directly affects how they adhere to the measures.

xviii. There was a statistically significant relationship between perceived control behavior with adherence to public health measures, $\chi2=96.1414$, *p<0.05*. This finding implies that personal control behavior affects how one prefers to adhere to the public measures aimed at mitigating COVID-19.

xix. The multinomial logit regression showed that attitude was statistically significant for acceptance and non-acceptance of the public health measures($\beta=5.459$, *p=0.01*, odds ratio=234.97) and ($\beta=-0.608$, *p=0.004*, odds ratio=0.545) respectively. On the hand, age ($\beta=-0.021$, *p=0.012*, odds ratio=0.98), education level ($\beta=0.272$, *p=0.012*, odds ratio=1.313), place of residence ($\beta=0.652$, *p=0.002*, odds ratio=1.92), subjective norms ($\beta=0.813$, *p=0.000*, odds ratio=2.255) and perceived controlled behaviour ($\beta=0.294$, *p=0.02*, odds ratio=1.341) were significant for acceptance of the public health measures for controlling COVID-19 in Mombasa County as compared to the neutral category.

xx. Gender, profession, source of water, and religion have no predictive significance on the acceptance of public health measures in Mombasa County.

xxi. No variable significantly affected non-adherence of the public health measures at $\alpha=0.05$.

xxii. Multinomial logit regression shows education level ($\beta=-0.365$, *p=0.002*, odds ratio=1.441), religion ($\beta=0.48$, *p=0.033*, odds ratio=1.615), place of residence ($\beta=0.959$, *p=0.000*, odds

ratio=2.609), profession (β=0.223, *p=0.001*, odds ratio=1.25), water source (β=-0.55, *p=0.014*, odds ratio=0.577), subjective norms (β=0.695, *p=0.000*, odds ratio=2.003), attitude (β=-0.9, *p=0.000*, odds ratio=0.406), and perceived controlled behaviour (β=0.346, *p=0.007*, odds ratio=1.414) had a significant effect adherence of public health measures as compared to the neutral category. Furthermore, age and gender showed no significant effect.

5.3 Conclusions

The primary purpose of this study was to explore the association between normative behaviors, acceptance, and adherence to COVID-19 disease control guidelines among communities in Mombasa. The study's first objective was to establish the extent to which normative behavior is associated with the acceptance of public health measures for controlling COVID-19. Based on this objective, a hypothesis was developed suggesting that normative behaviors, defined in terms of attitude, subjective norms, and perceived controlled behaviors, do not substantially impact the acceptance of public health preventive measures. According to the findings, an association can be considered statistically significant between normative behaviors and how individuals prefer to accept public health preventive measures. In addition, confounding factors such as age, gender, profession, level of education, and religious affiliation all have a statistically significant impact on a person's acceptance of public health initiatives. It was discovered that having a continuous water source did not have a statistically significant effect on the measures' level of acceptance. The conclusion that normative behaviors are statistically associated with the acceptance of public health measures to control the COVID-19 pandemic can thus be drawn.

The study's second objective was the nature of the association between normative behaviors and adherence to public health interventions to control COVID-19 in Mombasa County. Based on this

objective, it was hypothesized that an individual's attitude, perceived controlled behaviors, and subjective norms do not have a statistically significant effect on adherence to public health measures for controlling COVID-19 disease. According to the findings, there is statistically significant evidence to suggest disparities in individuals' normative behaviors regarding their adherence to public health preventive measures for controlling COVID-19. These findings were presented to us. The influence of confounding variables demonstrated that variations in education level, religion, gender, profession, and the availability of a continuous water source have a statistically significant effect on adherence to public health measures. There was not a statistically significant association found between the respondents' ages and their level of adherence to public health measures.

The third objective of this research was to test the hypothesis that an individual's normative behavior and the confounding variables do not substantially mediate acceptance or adherence to public health preventative measures. According to the findings, factors such as one's attitude, age, level of education, type of residence, subjective norms, and perceived amount of self-control all have a statistically significant role in determining one's level of acceptance of public health measures. Acceptance of public health preventative measures are not influenced by factors such as a person's gender, religion, profession, or even the availability of a continuous water supply. In addition, factors such as level of education, religion, occupation, residence, continuous source of water, subjective norms, attitude, and perceived controlled behavior had a statistically predictive effect on adherence to public health preventive measures. Based on the statistical investigation, there was no strong linkage between age and gender and adherence to public health preventative measures for COVID-19.

5.4 Recommendations

The study recommends the following based on study findings

1. Considering that subjective norms are vital predictors of adopting preventive health behaviors, people responsible for planning and implementing risk communication models may choose to engage influential groups to raise social pressure on adopting protective behaviors
2. Activities to improve or enhance attitude, perceived controlled behaviors, acceptance, and adherence to COVID-19 and its preventive measures should be intensified through appropriate information outlets such as posters, Facebook, Twitter, television, and radio.
3. Legal enforcement for the prevention of COVID-19 must be renewed, as well as the potential that stringent precautions be followed and put into practice.
4. Religion should be considered in the execution of health directives as an essential element of the community's everyday activities, attitudes, and beliefs. Incorporating health directives into religious events by religious experts could increase the community's commitment to health-related directives.
5. The report proposes focusing on the less educated, people in communal housing, and the elderly. These findings may be helpful to policymakers in identifying the target populations for the COVID-19 prevention and health education programs

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APPENDICES

Appendix 1: Household Questionnaire Guide

Household: 'Lived Experienced Survey'

Compliance to public health strategies in response to the pandemic in Mombasa, Kenya varies widely. Some members of the community strictly adhere to preventive behaviors while others don't. There has never been consistent among the community members to strictly adhere to preventive behavior for COVID-19. This investigation focuses on finding why some members in the community strictly adhere or fail to adhere to public health measures defined by the government. The area of interest is your personal 'lived experience' regarding regular adherence to preventive behavior. Regular adherence to preventive behaviors means proper wearing of face mask, hand sanitization, immunization, maintaining social distance and avoidance of gatherings. You are kindly required to read each question carefully and respond to the best of your ability. Whatever answer you provide is acceptable; we are merely interested in your personal lived point of view.

Please enter the date, the ward code, and household code (the 2 initials of the First, Second and Last Name of the head of household) in designated spaces. The research assistants have nothing to do with this study. All responses of this survey are completely confidential. All identifying

information will be removed from this questionnaire and destroyed as soon as all data has been collected. Participation is voluntary through verbal consent.

Thank you for your participation in this research

A. Social Demographic Characteristics

1. Age:
2. Gender: tick where appropriate

   Male Female Transgender Intersex Others
3. Level of Education: tick where appropriate

   Nursery Primary Secondary College University
4. Religion: tick where appropriate

   Christianity Islam Hinduism Pagan Others (specify)
5. Work related experience (Professional qualification):

   Casual Laborer Mechanics Driver Teacher Health Care Worker Others (specify) – question should have been open as the responses are inadeaquate

B. Household Characteristics

1. Number of people in that household?
2. The youngest at what age?
3. The oldest at what age?
4. Do you have a continuous source of water? Probe further
5. Do you reside in a permanent or a rental house – [Direct Measures of Subjective norms, Attitude, and PerceivedControlled Behavior)]

C. Practice of acceptanceto public health measures

1. I wash my hands often

Strongly disagree [] Disagree [] Not sure [] Agree [] Strongly agree []

2. For me, prevention of COVID-19 is necessary

   Strongly disagree [] Disagree [] Not sure [] Agree [] Strongly agree []

3. I pay attention to how I cough/sneeze in public places

   Strongly disagree [] Disagree [] Not sure [] Agree [] Strongly agree []

4. I wear a mask when I go outside

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

5. I have meals with non-family people at the same table

   Strongly disagree [] Disagree [] Not sure [] Agree [] Strongly agree []

6. If I believe in my friends, I may not use any protection against COVID-19 when I am around them

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly agree []

7. For me, vaccines are used to control the population

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly agree []

D. Practice of adherence to public health measures

8. I wash my hands often

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

9. For me, prevention of COVID-19 is necessary

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

10. I pay attention to how I cough/sneeze in public places

    Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

11. I wear a mask when I go outside

    Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

12. I have meals with non-family people at the same table

Strongly disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

13. If I believe in my friends, I may not use any protection against COVID-19 when I am around them

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

14. For me vaccines are used to control the population

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

E. Subjective norms

1. I normally cover my face with mask or hijab when going out

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

2. It is normal to cover my mouth when sneezing or coughing

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

3. I normally eat in the company of friends and strangers on the same table

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

4. It is normal for me to wash hands when I want to eat

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

5.The best way I prefer greetings is by shaking someone's hand

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

6. I can't miss weddings or funerals

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

7. Most of the time I have no problem sharing a sit with people in a matatu or in a waiting room

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

8. I normally perform my prayers in congregation

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

F. Attitude towards preventive behavior

1. I don't think washing hands regularly will prevent me from getting COVID-19 infection

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly agree []

2. I don't think it is a big deal to put on a face mask because I can naturally heal without medical care even if COVID-19 infect me

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

3. I will not think about COVID-19 preventive measures until I get infected

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

4. If there's a travel offer or a ride, I will always travel despite COVID-19

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

5. I may participate in gatherings (e.g., prayers, weddings, and funerals) especially those I think are important to me

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

6. If my good friends are going out, I will go even if I don't want to

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

7. I do not think it is necessary to continue closing bars, clubs, and other meeting points

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

8. I think COVID-19 restrictions are too much

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

9. COVID-19 mostly affects the rich and I am not into that circle

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

G. Perceived Controlled Behavior

1. Whether or not I adhere to public health measures on a regular basis is completely up to me:

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

2. Most of the peers whom I am acquainted with adhere to public health measures on a regular basis:

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

3. I am confident that if I wanted to, I would adhere to public health measures on a regular basis:

   Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

4. For me to adhere to public health measures on a regular basis is not a problem:

Strongly Disagree [] Disagree [] Not sure [] Agree [] Strongly Agree []

Appendix 2: Work plan

Time Frame 2021

Activity Description	April-August	September	October	November	December
Drafting of the Research Proposal					
Review and approval of the Draft by the Supervisor					
Defending the proposal in a panel of lecturers and students					
Data Collection:					
ODK tool questionnaire					
Interviews Conducted					
Data Analysis					
Finalizing on the research project					

Appendix 3: Map of the study sites

Figure 13: Changamwe Sub- County Map

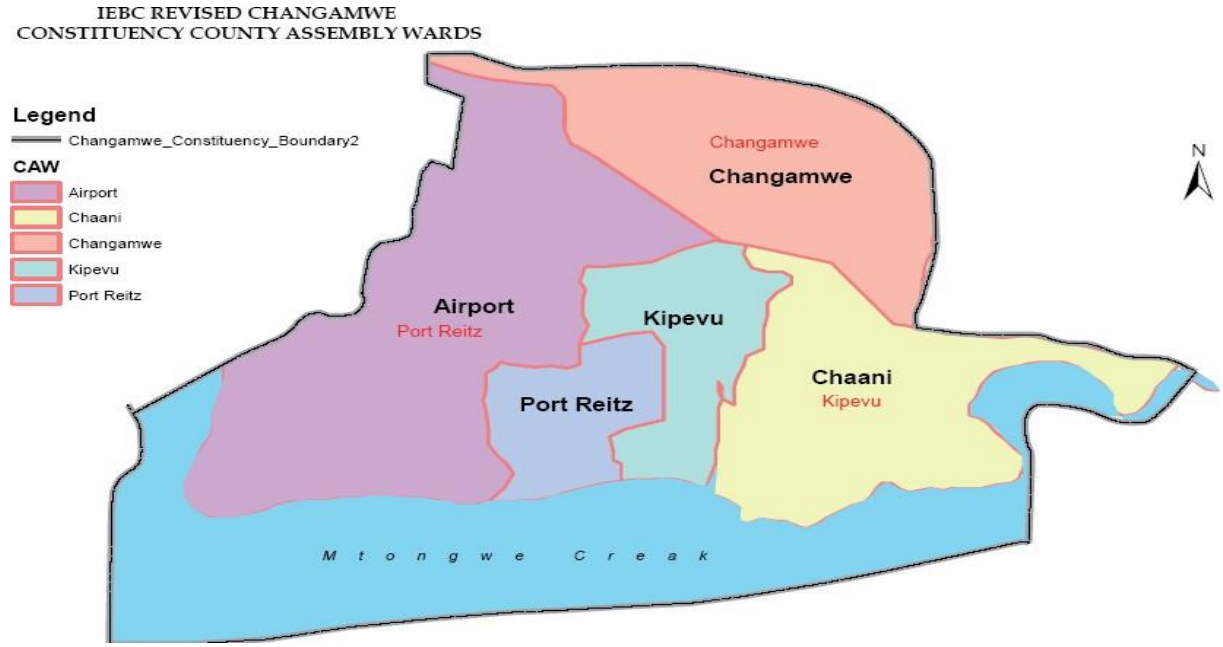

Figure 14: Jomvu Sub- County Map

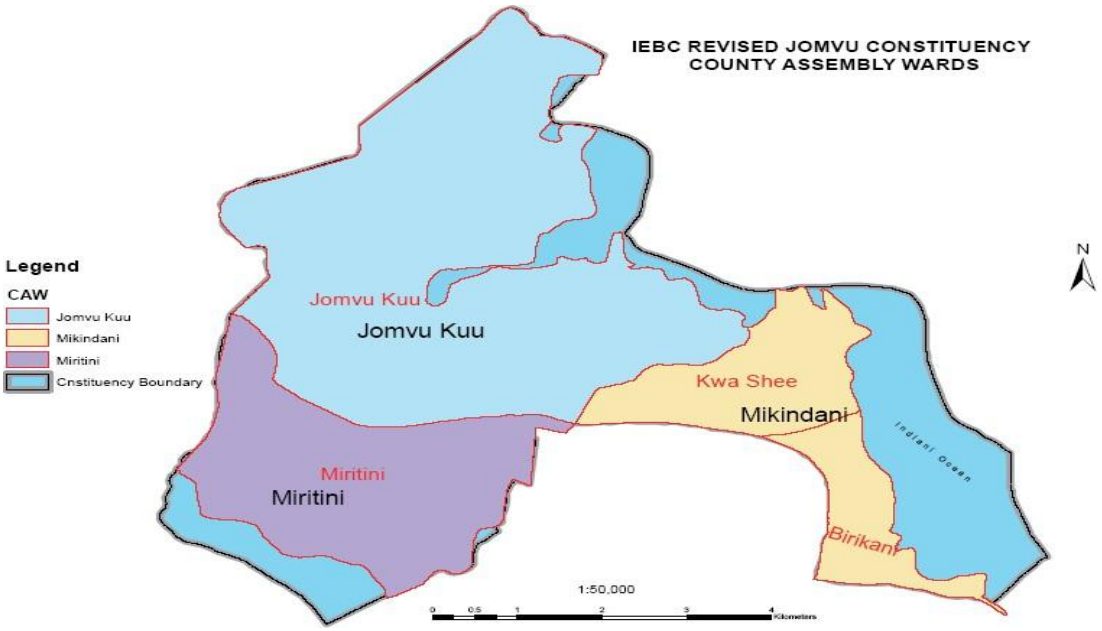

Figure 15: Mvita Sub-County

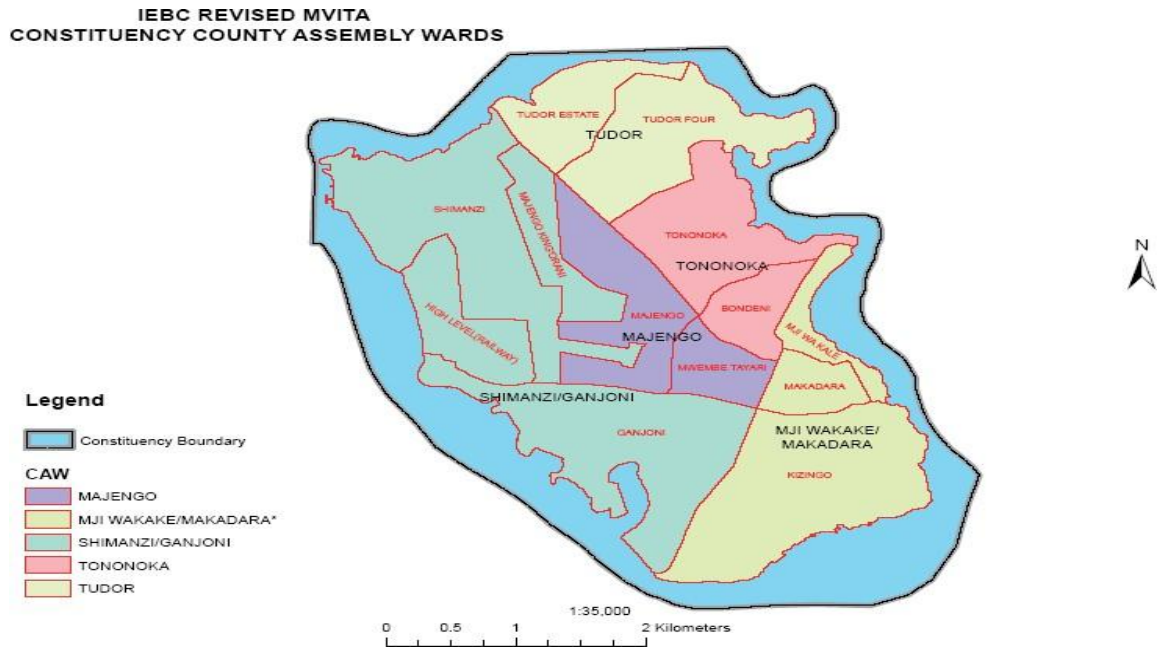

Figure 16: Kisauni Sub-County