COVID-19 VACCINE ACCEPTANCE, COMPLIANCE AND ADHERENCE TO WHO COVID-19 PROTOCALS AMONG HEALTH CARE WORKERS IN HOMABAY TOWN SUB COUNTY, HOMABAY COUNTY, KENYA.

BY

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DECLARATION

Declaration by the student

This thesis is my original work and has not been presented for an award of a Master's degree or diploma in any other university or institution.

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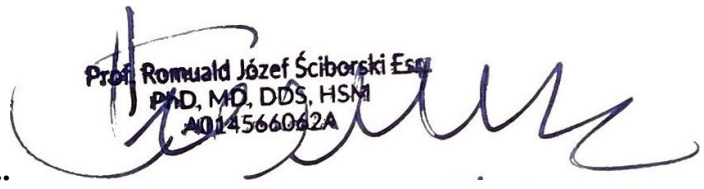

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DEFINITION OF TERMS

Healthcare worker: This is someone who offers services to the sick either directly or indirectly. In this context Clinical officers and Nurses.

Vaccine Acceptance: Is the willingness of the study participants to receive the Covid-19 vaccine. In this context it was synonymous with vaccine uptake

Vaccine Hesitancy: This is delay in acceptance or refusal of vaccination despite the availability of vaccination services. One may decline a vaccine, but they may also delay it or even accept it in due time despite their doubts/reluctance. In this study, vaccine acceptance and non-hesitancy were used interchangeably.

Covid-19: Coronavirus disease 2019 (Covid-19) is a communicable respiratory disease of public health concern caused by SARS-CoV-2 v, which cause illness in humans (World Health Organization, 2020). It originated in Wuhan city of the Hubei region of China and it spread rapidly all over the world. It spreads through infected air droplets that are projected during sneezing or coughing.

Compliance with Covid-19 vaccine: Getting all the doses of Covid-19 vaccination within the stipulated timeframe.

Non-compliance: Missing a dose of Covid-19 vaccine.

Adherence to Covid-19 protocols: Observing handwashing, masking up, keeping social distance

ACRONYMS AND ABBREVIATIONS

HCW - Health Care Worker.

COVID-Corona Virus Disease

CDC – Centre for Disease control

SARs -Severe Acute Respiratory Syndrome

WHO-World Health Organization

FDA-Food and Drug Administration

SITREP-Situational report

ABSTRACT

Health Care Workers are at the front line in the fight against Covid-19. The acceptance or otherwise of the Covid-19 vaccine by health care workers can influence the uptake of Covid-19 vaccines among the general population as they are a reliable source of health information. With the fragile Health care system in low- and middle-income countries, Kenya being among them, the use of Covid-19 preventive measures is also strongly recommended and adherence to preventive measures of Coronavirus disease 2019 (Covid-19) was among the means to tackle the transmission of the virus. However, reluctance to implement the recommended preventive measures has been reported to be a major problem everywhere including in Healthcare workers. This study explored the acceptance of Covid-19 vaccine and compliance and adherence to WHO Covid-19 protocols among the healthcare workers in Homabay town Sub County, Homabay Kenya. The study was a cross-sectional web-based that was done between August 2022 to October 2022 among 300 health care workers where an online survey was used to collect data. Quantitative data was analyzed using SPSS version 23. Pearson's Chi-square test was used to test for statistical significance between the categorical variables. Qualitative data was subjected to thematic analysis. The study recorded a response rate of 85.3%. The acceptance was at 98.8% however, there was delay in time to acceptance where 39.1% of HCWs were vaccine hesitant within the first six months of vaccine roll out. The study reported a 1.2% overall non-compliance rate to Covid-19 vaccine 18 months after vaccine roll-out. The HCWs stated vaccine side effects, safety concerns and low risk of getting Covid-19 as reasons for non-compliance Gender was significantly associated with vaccine hesitancy ($p<0.043$). On the four domains of adherence to Covid-19 prevention protocols, 37.5% did not adhere to handwashing ,51% did not avoid crowds ,48% did not adhere to donning of masks and 43.8% did not observe social distancing. In conclusion, the uptake was good however, there was a delay in time to acceptance and gender was significantly associated with vaccine acceptance. This study therefore recommends Homabay county to focus on male gender in case of any future vaccination drives and another study involving a larger cohort of different HCWs to ascertain the acceptance level since this study only focussed on nurses and clinical officers.

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CHAPTER ONE: INTRODUCTION

1.0 Background Information

Coronavirus disease 2019 (Covid-19) is a contagious respiratory illness caused by SARS-CoV-2 virus, posing a significant public health threat (World Health Organization, 2020).Its epicentre was Wuhan city in China's Hubei region and it rapidly spread worldwide. It spreads via infected air droplets during sneezing or coughing. Transmission occurs primarily through through infected respiratory droplets from coughs and sneezes or via contact with contaminated surfaces followed by touching the eyes, nose, or mouth (Chong & Yin, 2020)

Initially reported in China, Covid-19 has since become a global pandemic. The severity of the disease is influenced by factors such as age, gender, and underlying health conditions. Unfortunately, there is no known cure for Covid-19, emphasizing the urgency of vaccination efforts.(Kannan et al., 2020)

Covid-19 exhibits a range of symptoms, from mild to severe, including fever, dry cough, and fatigue. Less common symptoms encompass aches, sore throat, diarrhea, conjunctivitis, headache, loss of taste or smell, and skin rashes or discoloration of fingers or toes.(Centers for Disease Control and Prevention, 2020).

To mitigate disease transmission, individuals and communities have implemented measures such as improved hand hygiene, physical distancing, and personal protective equipment. Nonetheless, given the global economic challenges and uncertain future, widespread Covid-19 vaccination remains the most promising solution to curb the epidemic (Ackah et al., 2022).

As of December 3, 2022, there have been 645 million reported Covid-19 cases globally, with 6.64 million related deaths. Approximately 64.6% of the world's population has received vaccination. These numbers continue to fluctuate due to daily reports, and certain regions, like South Africa, are grappling with a fourth wave of infections (WHO, Covid 19 Updates, 2022).

In Africa, Covid-19 has affected 47 countries, with over 9,007,048 million reported cases and 81,785 fatalities (Sohrabi et al., 2020). As of November 28, 2022, Kenya has reported 341,515 cases and 5,684 Covid-related deaths (WHO, Covid 19 Updates, 2022)

Kenya's goal is to fully vaccinate 19 million adults, constituting 70% of the adult population, by the end of June 2022. Currently, 8,462,289 adults have been vaccinated, with Homabay County reaching a vaccination rate of 27.3% among its population (Mutahi, June 2022)

Healthcare workers (HCWs) face an elevated risk of contracting and transmitting Covid-19. Notably, Homabay County recorded its first HCW fatality due to Covid-19. HCWs serve as community role models regarding Covid-19 vaccination attitudes, making their acceptance of vaccination pivotal in pandemic containment efforts. Previous research has provided limited insights into HCWs' perspectives.

Vaccine hesitancy entails delaying or refusing vaccination despite availability. It may vary by context, location, and vaccine type, influenced by factors like complacency, convenience, and confidence (MacDonald et al., 2015).

1.1 Problem statement

Covid-19 disease is a serious communicable disease of great public health concern worldwide and much is unknown about it. Currently, there is no known treatment or cure except for prevention by vaccines. If everyone is to be vaccinated, then the spread of this virus from one person to the other would be prevented or, even lessen the symptoms of the disease for those infected. HCWs are the major drivers to the spread of Covid-19 since they handle Covid-19 infected persons and also interact with their family members. This makes HCW to be at risk to the community at large.

According to a survey conducted in USA on medical students in a university, 25% of them became hesitant to be vaccinated as soon as an FDA-approved vaccine was made available despite perceived risk of exposure to Covid-19 infection. A different study done in Kenya in January 2021before availability of Covid vaccine on acceptability of Covid 19 among HCW showed that 29% of HCW would decline it but this was before availability of vaccine .

This is different from other studies which showed risk perception as a central predictor of protection intentions and preventive health behaviours (Lucia et al., 2020). Given the low acceptability as earlier reported, the government of Kenya enhanced campaign to improve the acceptability by HCW however, there has been no evaluation of the improvement of the acceptability and compliance. This study therefore assessed the acceptance, compliance and adherence to Covid protocol among HCWs in Homabay Town Sub county.

1.2 Objectives

1.2.1 Broad objective

To assess Covid-19 vaccine acceptance, compliance and adherence to WHO Covid-19 protocols among the HCWs in Homabay town Sub County, Homabay County

1.2.2 Specific Objectives

1. To assess the uptake of Covid -19 vaccine among HCW in Homabay town sub-county.
2. To determine compliance in Covid-19 vaccination among HCWs in Homabay town sub-county.
3. To assess adherence level to WHO Covid 19 protocols after vaccination among the HCW in Homabay town sub-county.

1.2.3 Research Questions

1. What's the level of uptake of Covid-19 vaccine amongst the HCWs in Homabay town Sub County?
2. What's the level of compliance to Covid-19 vaccination among HCWs in Homabay town Sub County?
3. What's the level of adherence to WHO Covid 19 protocols after vaccination by the HCWs in Homabay town Sub County?

1.3 Study Justification

As of November 2021, a preliminary analysis conducted by the World Health Organization (WHO) revealed that only 27% of healthcare workers in Africa had received full Covid-19 vaccination, leaving the majority of the healthcare workforce vulnerable to the pandemic (OKA, 2021).

According to reports from WHO's African Region, health workers accounted for over 150,400 Covid-19 infections, which constituted 2.5% of all confirmed cases and 2.6% of the total health workforce in the region. Notably, 70% of these Covid-19 infections among health workers were concentrated in Algeria, Ghana, Kenya, South Africa, and Zimbabwe (OKA, 2021).

This data showed that most Health care workers did not get vaccinated by then. However, it's important to note that this might not be the same picture as now since there is an ongoing rapid

result initiative on vaccination but since there's no data to substantiate this, this study informed us of the vaccination uptake, compliance and adherence to WHO Covid-19 protocols amongst Health care workers in Homabay town sub-county. This will help in developing measures that will improve Covid-19 vaccine confidence among healthcare workers and in their communities (Agyekum et al., 2021)

1.4 Study Significance

The study showed that Covid-19 vaccine among the HCWs was accepted by almost all the HCWs with gender playing a role in the acceptance. Very few were not compliant to the vaccine. This might in turn influence the uptake of this vaccine among the general population as HCWs are a reliable source of information. This will also be beneficial since it will help in combating this Covid pandemic and even lead to the opening up of the economy.

1.5 Study limitations

Recall bias since the Covid-19 vaccination has now lasted for more than a year. However, this was prevented by standardizing the questionnaire for data collection. Consequently, the HCWs were encouraged to sign in to the online health portal to get the vaccination information.

1.6 Scope of the study

The study was done in Homabay town sub-county, Homabay County. Only Clinical officers and nurses working in Homabay town Sub County participated.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The spread of Covid-19 has been rapid since its emergence and scientists have been working on discovering its cure and 67 % of the population needs to be vaccinated for herd immunity to be realized (Ackah et al., 2022).

It was observed that the Covid-19 outbreak had progressed significantly within the WHO African Region since the initial case was reported. This escalation was attributed to the increased incidence resulting from the spread across porous borders, leading to a shift from localized outbreaks to widespread community transmission (Duchmann, 2020). Furthermore, there was a growing occurrence of cross-border transmission of Covid-19 among countries in the continent, primarily facilitated by long-distance truck drivers and illegal movements through inadequately controlled borders. This phenomenon was evident in most countries, where the disease had transitioned into community transmission and was no longer confined to specific regions.

WHO preventive methods like hand washing, maintaining of distance, and confinement were implemented to contain the spread of coronavirus. The measures had limited success in prevention of Covid-19 infection though vaccination drive seemed protecting against the virus (Kumari et al., 2021). However, given the increase in vaccination intervention and the reduction in Covid-19 infections, some of these strategies had been relaxed. An Ethiopian study on prevention measures and its associated factors reported that a big proportion of healthcare workers were non-adherent to Covid-19 mitigation measures where adherence was reported to be at 50.24% from the study (Aemro et al., 2022).

World Health Organization defined vaccines as “pharmaceutical products that help body’s immune system to recognize and fight pathogens like viruses or bacteria, which then keeps people safe from diseases they cause” hence saving lives, prevent diseases and disabilities every year. Nevertheless, vaccine hesitancy is alarming due to potential to cause delays/rejections in vaccination (ERKEKOĞLU et al., 2020b).

Vaccination therefore remains the most effective way of reducing serious morbidities or mortalities that are due to infectious diseases and so measures for increasing uptake and looking into the effects of Covid-19 vaccine should be developed and a global strategic approach be considered.

Mass Covid-19 vaccination programs success is dependent on the number of people at the vaccination centers however, a significant number have not been turning up (Freeman et al., 2021).

Vaccine acceptability was greatly determined by knowledge, attitude, practices, safety concerns, perceived risks and benefits. This was from a study that was looking at scope, determinants and vaccine hesitancy in covid-19 vaccination drive (MacDonald et al., 2015).

The pandemic has been escalating in Africa and gaps in response capacity noted have been on limited supply of personal protective equipment like face masks, Inadequate water supply for handwashing, keeping of physical distance at the health clinics and also human resource to take care of patients. Without addressing these, mortality from Covid infection is expected to be high (Chersich et al., 2020).

From Kenya's Ministry of Health SITREP report, as at 7th July 2021 SITREP report, a total number of vaccine doses given were 1.5 million, out of which 456000 had been fully vaccinated which translated to 0.9% of the population vaccinated (Kagwe, 2021).

2.2 Uptake of COVID-19 vaccine

For an immunization program to be successful, a large area should be covered with vaccination, acceptance needs to be high, different perceptions should be put into consideration and develop confidence with media sources (Malik et al., 2020). Whereas vaccine hesitancy is delay or failure to get vaccination, World Health Organization (WHO) Strategic Advisory Group of Experts on Immunization noted from multiple studies that hesitancy on vaccine was growing worldwide and was among the major global health threats (European Parliament, 19 April 2018)).

Morbidity and mortality from Covid-19 is still in the looming and therefore countries should prioritize distribution of Covid-19 vaccine at the same time strengthening health systems so as to build trust and increase uptake. Vaccination uptake is influenced by factors such as; physical availability, affordability and access to vaccination services, Service quality, cultural specificity interms of place and time are also some of the factors that influence uptake (Larson et al., 2014).

Centres for Disease developed a vaccination framework that prioritized people at a high risk for acquiring and transmitting Covid-19 and those with pre-existing medical cases. Vaccination

of healthcare providers (HCPs) were prioritized to be able to provide services to Covid infected patients (Lucia et al., 2020).

Misinformation about vaccines was a major hinderance to vaccine uptake and therefore there was need to develop vaccine literacy to convince the public to take up vaccination services (Fadda, 2020).

From a study done by systematic and meta-analysis review of studies done among HCWs in Africa, acceptance in HCWs was at 28% with vaccine acceptance intention at 51% (Ackah et al., 2022).

Another survey carried out in China among HCWs reported 77% acceptance rate with 18.3% hesitancy rate (Wang et al., 2021).

In India, from a study done by Harrison *etal* after launching of vaccination, a portion of significant persons eligible failed to take another dose after the first dose notwithstanding the enormous input made. People were still hesitant to accept the vaccine (E.A. Harrison, 2020).

A recent study done in Kenya on the general adult population visiting different health care facilities noted covid-19 vaccine acceptance to be at 79.9%.40.5% cited vaccine side effects for being hesitant while 72.2% were fully vaccinated against Covid (Shah et al., 2022).

Another study carried out on HCWs in Egypt concerning Covid-19 vaccine hesitancy, it was noted that the participants with advancement of age took the vaccine i.e. age 45yrs and above and also those with chronic diseases (Ar & Hussein, 2021).

2.3 Factors influencing COVID-19 vaccine acceptance

For a country's vaccination programme to be successful there should be a mechanism to identify any determinants and barriers to the uptake of the immunization process to inform strategies and mechanisms to address such gaps.

According to a survey conducted in USA on medical students in a university, it was noted that 25% would fail to go vaccination as soon as an approved vaccine would be available. The study differed from a previous one where perception of risk was thought to be a motivator towards behaviour change (Lucia et al., 2020).

Vaccine side effects, mistrust towards health experts, need for transparency and concerns about vaccine development speed were some of the factors they quoted as influencing the uptake of Covid-19 vaccine.(Lucia et al., 2020)These findings also mirrored another study by Fisher *etal* where 57-69% of the general public reported mistrust of the vaccine as a major hinderance to their vaccine acceptance (Fisher KA, September 4,2020).

Since HCWs play a critical role in influencing vaccination decisions; (Reiter PL, 2020) their recommendations should be one of the strongest correlates of vaccine acceptability among patients and the Covid-19 vaccine should be in their list of referrals too. All HCWs at different levels of interaction should have a unified message supporting Covid-19 vaccination to also improve on acceptability and uptake (Schaffer DeRoo S, 2020).

The factors of confidence, complacency, and convenience, when lacking, can exert a detrimental influence on vaccination uptake, thereby contributing to vaccine hesitancy. Importantly, this issue is not limited to any particular setting and can be observed even in high-income countries. Ultimately, it erodes public trust in vaccination, leading to hesitancy and vaccine refusal.

In low and middle-income countries, a notable challenge is the scarcity of communication resources, which limits the capacity to counteract negative information regarding vaccines and garner community support for vaccination initiatives (Elhadi et al., 2021).

Trust is important for an uptake of a prevention program, it also contributes to public compliance and is strongly associated with vaccine acceptance from previous studies that had been done. One of the lessons learnt in a study by Lazarus *etal* on infectious disease outbreaks was that trusted information sources were fundamental to disease control (Lazarus et al., 2021).

From another survey by Lazarus *etal* on potential acceptance of vaccine, the acceptance level was too low to confer herd immunity hence calls for increased trust in the general population and interventions were important to be crafted (J.V. Lazarus, 2021).

Clear and effective communication from authorities plays a crucial role in enhancing public confidence in vaccines. This entails providing explanations about the vaccine's mechanisms, the developmental process from recruitment to regulatory approval, emphasizing safety and efficacy. Successful campaigns should also prioritize conveying information regarding the vaccine's effectiveness, the duration required for protection, and the significance of achieving widespread vaccination coverage (J.V. Lazarus, 2021).

In a study carried out in Finland about Covid-19 vaccine acceptance, (Hammer, 2021) There was decline with vaccine acceptance from 70% to 64%. Complacency and worry about side effects worked against vaccination while disease severity was a strong motivator for vaccination. Enablers for vaccination were vaccine convenience and HCW recommendation in people below 50 years.

In the United States, a study on vaccine hesitancy among nurses revealed that just 37.5% of the nursing staff had received vaccinations. The remaining nurses expressed hesitancy due to various factors, including distrust in government and pharmaceutical companies, concerns about vaccine side effects exacerbated by misinformation on social media, and apprehensions among Black healthcare workers rooted in a history of medical racism (Berry et al., 2021).

In a separate study conducted in India involving medical students, several factors were identified as predictors of Covid-19 vaccine hesitancy. These included concerns regarding the safety and efficacy of the vaccines, apprehension about the expedited testing processes preceding vaccine launch, and a lack of trust in government agencies. Conversely, a lower risk perception regarding contracting Covid-19 and a reduced willingness to participate in Covid-19 vaccine trials were associated with decreased levels of Covid-19 vaccine hesitancy (Jain et al., 2021).

Additionally, the study found that prior adult vaccination did not influence Covid-19 vaccine hesitancy. However, the implementation of targeted awareness campaigns, rigorous regulatory oversight of vaccine trials, the public dissemination of safety and efficacy data, and engagement in trust-building initiatives could serve as effective strategies to further reduce Covid-19 vaccine hesitancy among healthcare workers (Oliver et al., 2021).

N. Puri and colleagues highlighted that vaccine hesitancy can be exacerbated by health information obtained from various sources, including the internet and social media platforms. Unlike traditional media, social media enables individuals to rapidly create and disseminate content worldwide without editorial oversight. This has raised significant public health concerns regarding the dissemination of anti-vaccination messages on such platforms and the potential for subsequent vaccine hesitancy. This includes the potential compromise of public confidence in the development of vaccines for emerging pathogens like SARS-CoV-2, aimed at preventing diseases such as Covid-19 (Puri et al., 2020).

The Health Belief Model helps explain an individual's perceived susceptibility, which relates to their subjective assessment of the risk of contracting an illness or disease. There is significant variability in how individuals perceive their personal vulnerability to specific health conditions.

In a study conducted in France among healthcare workers regarding their intention to receive the Covid-19 vaccine, it was observed that several factors influenced vaccine acceptance. These factors included being of older age, male gender, and experiencing fear concerning the

Covid-19 vaccine. Notably, nurses and assistant nurses were found to be less inclined to accept vaccination against Covid-19 compared to physicians (Gagneux-Brunon et al., 2021).

2.4 Adherence to Covid-19 Protocols

The impact of Covid-19 on public health has been severe, with governments implementing strict public health measures, movement restrictions, and lockdowns. In the absence of a vaccine, one of the primary strategies to control the pandemic has been through behavioural changes, including practices such as physical distancing, frequent hand washing, and the use of face (Daas et al., 2021).

Promoting adherence to Covid-19 preventive measures is essential in curbing the virus's transmission. However, reluctance to follow the recommended protocols has been a widespread issue. A study conducted in Ethiopia to assess adherence levels revealed that they were notably low, and factors such as knowledge and occupation were associated with this reduced compliance (Abeya et al., 2021).

Given the absence of a cure for Covid-19 infection, the World Health Organization (WHO) recommends key containment measures, including mask-wearing, maintaining social distance, and avoiding crowded gatherings. These measures are crucial in limiting the spread of the virus. (Abeya et al., 2021).

According to a study conducted in Vietnam, a significant proportion of participants demonstrated adherence to Covid-19 preventive measures. Specifically, 88.2% adhered to physical distancing rules, 99.5% wore face masks, 94.9% covered their mouth and nose during coughing and sneezing, and 97.4% practiced regular handwashing with water and soap (Abeya et al., 2021).

In contrast to the previously mentioned findings in Vietnam, the adherence level to Covid-19 preventive measures in Africa was considerably lower . A knowledge, attitude, and practice assessment survey conducted in Africa revealed that only 12.3% of the study participants adhered to the recommended Covid-19 preventive measures. However, some preventive measures, such as avoiding handshakes, refraining from consuming uncooked food, limiting gatherings, and practicing frequent handwashing, were implemented by 81.4%, 77.2%, 69.9%, and 65.8% of the participants respectively (Abeya et al., 2021).

2.5 CONCEPTUAL FRAME WORK

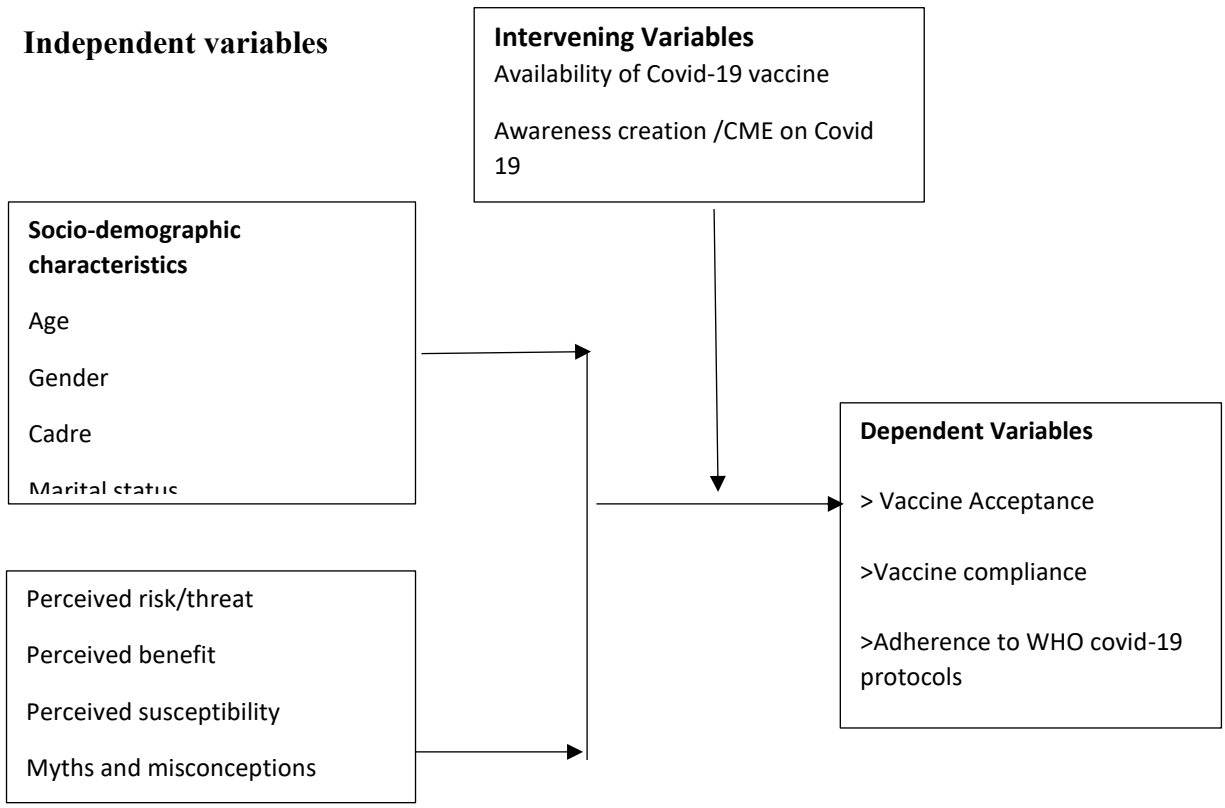

Figure 2.1: Conceptual Framework (Source: Author C. Akoth,2022)

This frame work was borrowed from Health Belief Model (HBM) It's a model that can be used to guide health promotion and disease prevention programs. It explains that a person's beliefs in personal threat of an illness or disease and the benefits from a particular behaviour would predict the likelihood of that person to adopt the behaviour. Individuals course of action depends on the persons perceptions of the benefits and barriers to a health behaviour. In this case I focussed on the same to understand Covid-19 vaccine acceptance and compliance (Rosenstock et al., 1988).

CHAPTER THREE: METHODOLOGY

3.1 Study area

Study area is Homabay Town Sub County and is one of the 8 sub counties in Homabay County. It's lies on the south shore of Winam Gulf of Lake Victoria, in western Kenya. It lies near Mount Homa with a population of 117,439 (2009 census). Homabay Town Sub County has a total of 23 health facilities out of which 10 are of either private practice or NGOs. It has 2 Sub county hospitals, 10 health centres, 3 dispensaries with 7 private practice and one County Referral and Teaching Hospital.

3.2 Study Design

A web-based cross-sectional survey using a validated questionnaire assessed the uptake of Covid-19 vaccine, compliance to the vaccine and adherence to the Covid-19 protocols after vaccination among health care workers in Homabay town Sub County.

3.3 Study population

Study participants were 300 HCWs (clinical officers and nurses) in different Health facilities in Homabay town Sub County.

3.4 Inclusion Criteria

1. Either a nurse or a clinical officer working within Homabay Town Sub County.
2. Key informant was a sub county public Health nurse, a Sub County clinical officer or any other member of a County/Sub County Health Committee.

3.5 Exclusion Criteria

1. Inaccess to smart phone or internet
2. Incomplete questionnaires

3.6 Sample size determination

Sample size was a census of all Clinical officers and nurses within Homabay Town Sub-County both in private sector and Public health facilities.

3.7 Sampling technique

Non-probability sampling technique (convenience sampling) was used to recruit the Health care workers for the study. Purposive sampling technique was used to recruit Key informant interviewees.

3.8 Data collection tools

Google link close-ended questionnaire was used to collect quantitative data on the uptake level of Covid-19 vaccine. Semi-structured questionnaire was used to collect qualitative data.

3.9 Data Collection Procedures

The lead investigator obtained formal authorization from the Director of Health Services in Homabay County before commencing the enrolment of participants into the study. Data collection was carried out using a Google Form and through key informant interviews. Prior to questionnaire administration, participants were provided with a clear explanation of the study's objectives, assurances of confidentiality, and the voluntary nature of their participation.

Data collection took place over the period from August to October 2022.

The web link was sent by investigator to the Homabay town nurses and Clinical officers WhatsApp messenger. The WhatsApp groups were different for Clinical Officers and nurses. The questionnaire was filled by respondents then submitted back. It was retrieved from the google link form in an excel form, data was cleaned, incomplete forms were removed then summarized for analysis.

3.9.1 Data storage

Data collected from the participants was stored in the principal investigators cloud and Gmail account.

3.9.2 Data Security

Data security was ensured through anonymizing data and use of a strong password protection of both the cloud account and the laptop used while accessing the data.

Physical data in the form of paper records, such as key informants' responses was transcribed and stored in principal investigators cloud account.

The computer used in data collection and analysis was installed with an anti-virus to keep it safe from any virus.

3.9.3 Data dissemination

After completion of the study the findings was to be published and then shared in a scheduled meeting with Homabay CHMT (county health management team) and disseminated online, a copy was to be shared with the Study team.

3.9.4 Data destruction

Data would be stored for at least 3 years then shall be destroyed by deleting from the principal investigators cloud account.

3.10 Data quality control

The data was checked for completeness and consistency for the Google form link questionnaire filled by participant electronically. Incomplete questionnaires were not analyzed.

3.11 Data validity

Validation of the questionnaire was done through content validity where the researcher engaged the relevant expert, the county vaccine coordinator to review the questions to ensure they were relevant to the topic and research questions. Results from pilot test done were also considered in improving the validity of Google-link form questionnaires. Data cleaning was also done to ensure the collected data was valid.

3.12 Reliability

A pilot test was done with 10 % of the sample size from a different sub-county (Rangwe). This included 30 HCWs from Rangwe Sub-county and the questionnaires were reviewed. Feedback and suggestions gathered during the pre-testing phase were incorporated to enhance

the instrument's quality. The researcher assessed the instrument's reliability using Cronbach's alpha test method, resulting in a coefficient value of 0.8. This outcome confirms that the tool utilized in the study was both acceptable and reliable.

3.13 Quantitative Data Analysis

Fully completed questionnaires were sent, uploaded then extracted from Google form and exported to Microsoft Excel 2016(Microsoft Corporation) for cleaning and coding. Data analysis was completed using SPSS version 23. The overall socio-demographic characteristics of the study population were described using frequencies. Pearson's Chi-square test was used to test for statistical differences between the categorical and outcome variables. Confidence level was set at 95% and a p value of less than 0.05 was considered significant. Findings were presented in form of tables for easy interpretation.

3.14 Qualitative Data Analysis

Key informant interviews were transcribed verbatim in text and recorded word by word of what had been reported by the Key informants. Data was analyzed thematically where the transcribed verbatims were grouped into specific themes under the research questions.

3.15 Ethical Considerations

Study proposal was submitted to JOOUST Board of Post graduate studies, then (ERB) Ethical Review Board at Jaramogi Oginga Odinga Teaching and Referral Hospital to ensure the study was valid and promotes contribution to scientific knowledge. After approval by ERB, the researcher applied for a NACOSTI permit. Then approval from Homabay County Director of Health before data collection. Informed consent from the study participants and key informants was also sought.

CHAPTER FOUR: RESULTS

4.0 Sociodemographic characteristics

This study anticipated 300 HCWs (202 Nurses and 98 Clinical officers) in Homabay town Subcounty. Two hundred and seventy-nine participants consented to participate and filled the online version of the questionnaire out of which two hundred and fifty-six returned a correctly and completely filled form that yielded an 85.3% response rate. Almost half of the respondents, (121;47.3%) were aged between 31 to 40 years. (147;57.4%) of the respondents were female and sixty six percent of the respondents, (171;66.8%) were nurses. Gender was significantly associated with vaccine hesitancy ($p<0.043$). However, age category, Cadre, education level, religion, marital status, and facility level were not significantly associated with vaccine hesitancy. This is as summarized on table 4.1

Table 4.0: Sociodemographic characteristics

Factor	Total (%)	Hesitant (%)	Non- hesitant (%)	P value
Age Category(years)				
21-30	110(43%)	1(0.9%)	109(99.1%)	0.896
31-40	121(47.3%)	2(1.7%)	119(98.3%)	
41-50	22(8.6%)	0	22(100%)	
51 and above	3(1.2%)	0	3(100%)	
Gender				
Female	147(57.4%)	0	147(100%)	**0.043**
Male	109(42.6%)	3(2.8%)	106(97.2%)	
Cadre				
Nursing Officer	171(66.8%)	2(1.2%)	169(98.8%)	0.996
Clinical Officer	85(33.2%)	1(1.2%)	84(98.8%)	
Marital Status				
Married	195(76.2%)	2(1%)	193(99%)	0.983
Widowed	3(1.2%)	0	3(100%)	
Divorced	1(0.4%)	0	1(100%)	
Single	52(20.3%)	1(1.9%)	51(98.1%)	
Separated	5(2%)	0	5(100%)	
Religion				
Christian	233(91%)	2(0.9%)	231(99.1%)	0.251
Muslim	3(1.2%)	0	3(100%)	
Prefer not to say	20(7.8%)	1(5%)	19(95%)	
Education Level				
Specialist	12(4.7%)	0	12(100%)	0.896
Degree	47(18.4%)	1(2.1%)	46(97.9%)	
Diploma	192(75%)	2(1%)	190(99%)	
Certificate	5(2%)	0	5(100%)	

Healthcare facility level				
Dispensary	45(17.6%)	0	45(100%)	0.419
Subcounty hospital	104(40.6%)	2(1.9%)	102(98.1%)	
County hospital	34(13.3%)	1(2.9%)	33(97.1%)	
Referral hospital	73(28.5%)	0	73(100%)	
Total	**256(100%)**	**3(1.2%)**	**253(98.8%)**	

4.1: Uptake of Covid-19 Vaccine

The level of Covid-19 vaccine uptake was over ninety eight percent, (253;98.8%). The overall uptake and level of vaccine uptake was equally among the two cadres of health care workers. (Figure 4.1)

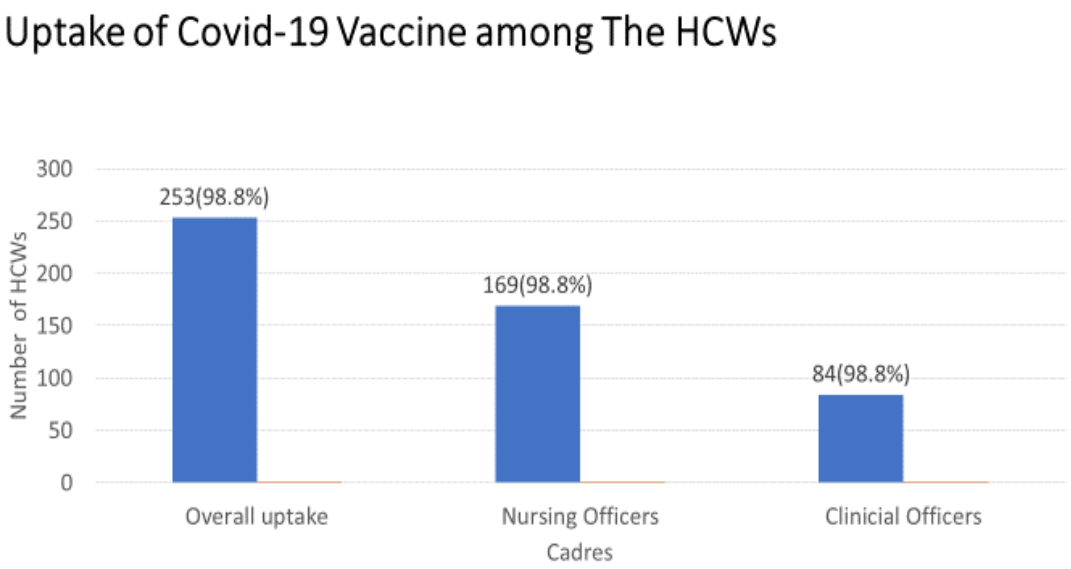

Figure 4.1: Level of COVID-19 vaccine uptake

Type of vaccine and time to acceptance

Majority of respondents (156;61.7%) accepted vaccine within the 6 months of roll out. However, the acceptance of AstraZeneca was the highest with 73% followed up by Moderna. The overall acceptance for each vaccine was; 64.4% for astrazeneca,8.7% for Moderna,20.9% for Johnson and Johnson and 5.9% for Pfizer. (Table 4.2)

Table 4.2: Time to Vaccine Acceptance

Time to vaccination	AstraZeneca	Moderna	Johnson &Johnson	Pfizer	Total
<6months	119(73%)	13(59.1%)	16(30.2%)	8(53.3%)	156(61.7%)
7-12 months	23(14.1%)	8(36.4%)	22(41.5%)	5(33.3%)	58(22.7%)
>12 months	21(12.9%)	1(4.5%)	15(28.3%)	2(13.3%)	39(15.2%)
Overall Acceptance	163(63.7%)	22(8.6%)	53(20.7%)	15(5.8%)	253(98.8%)

From figure 4.2, within a period of 6 months of the roll out, the acceptance was 61.7% and six months later it was 83.6% and after one year it was 98.8% (Figure 4.2)

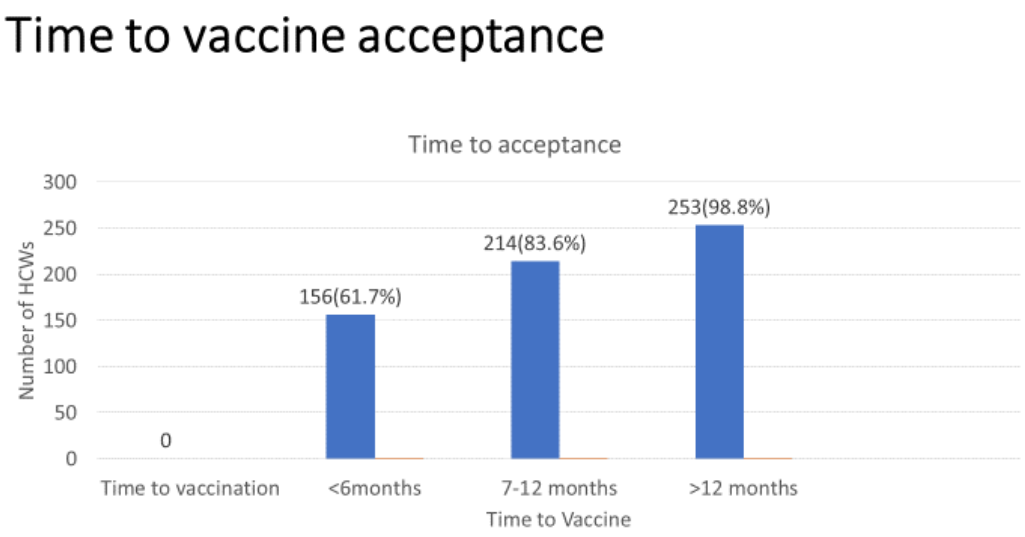

Figure 4.2: Time to vaccine acceptance

The study assessed a subcounty public health nurse/ Vaccine coordinator and Subcounty Clinical Officer regarding their views on Covid-19 vaccine uptake. Regarding vaccine acceptance they acknowledged acceptance still to be very low generally among all HCW regardless of the cadre whether being a nurse or clinical officer. They also stated that some got first doses but did not turn up for second doses or booster doses. Below was one of their responses.

"Acceptance of vaccine is very low generally amongst all HCW regardless of the cadre being RCO/RNO. Some got first doses but did not turn up for 2nd doses or booster doses" Sub County Public Health Nurse/Vaccines Coordinator**.**

They were also asked why they think some of the HCWs are not ready to go for the vaccine. Lack of adequate knowledge; rumours and misconception e.g. that its associated with blood clotting and also that exposure to Covid infection confers lifelong immunity against future infection and the policy of liberty to opt out since vaccination is not mandatory as reasons for vaccine hesitancy as evidenced by their responses below.

"Lack of adequate knowledge; Rumours and misconception e.g. that its associated with blood clotting and also that exposure to Covid infection confers lifelong immunity against future infection. The policy of liberty to opt out. It's not mandatory". Sub County Public Health Nurse/Vaccines Coordinator**.**

"There's inadequate information about the vaccine that needs to be shared". Sub-County Clinical Officer

Vaccine adverse events

Regarding their views on vaccine adverse events, they felt these need to be reported for documentation and classification and that anxiety regarding such events need to be addressed to allay the fears. Below are some of their views.

"Common side effects of vaccines and possible management should be shared. However, there are no reported adverse events because they are never reported for documentation and classification". Sub County Public Health Nurse/Vaccines Coordinator**.**

"Allay anxiety". Sub-County Clinical Officer

"They should be encouraged on encouraging the community vaccinated to report any adverse events experienced". Sub County Public Health Nurse/Vaccines Coordinator.

Experiences during COVID-19 Vaccination

Their experience on challenges encountered with the provision of vaccination in Homabay town subcounty was also sought. Vaccination apathy, erratic vaccine supply (not all types are available at a point in time), non-availability of commodities associated with the vaccination process e.g. stock out of cotton swabs, syringes, delays in system messaging. Porous system

(some HCWs had access to the messaging system hence are in the system as having been vaccinated when in real sense did not receive the vaccine. Rights have since been restricted) and lack of enough cold chain management were some of the main challenges they experienced.

"Adverse events reporting. HCWs/community complaining about associated vaccines side effects but are never reported through the right channel" Sub County Public Health Nurse/Vaccines Coordinator.

"Stock out of vaccines" Sub-County Clinical Officer

"Porous system (some HCWs had access to the messaging system hence are in the system as having been vaccinated when in real sense did not receive the vaccine. Rights have since been restricted)" Sub County Public Health Nurse/Vaccines Coordinator.

"Lack of enough cold chain management" Sub County Public Health Nurse/Vaccines Coordinator.

4.2 Compliance to COVID-19 Vaccine

This study reports a 1.2%. non-compliance rate to Covid-19 vaccine among the HCWs. (figure 4.1). The study also assessed reasons for non-compliance among this non-vaccinated group and reasons for not going for the second dose among the vaccinated group. The HCWs stated vaccine side effects, concerns about safety and perceived low risk of getting infected with Covid-19 as reasons for lack of uptake of vaccination. Those who took the first dose and failed to go for the second dose mentioned adverse side effects, fear, getting sick, belief that a single jab is enough to boost immunity and some mentioned taking a vaccine that is only administered once (a single/ one dose only Covid-19 vaccine) as reasons for not going for the second dose and thus their preference for one dose indeed the minority,13.2% that were not willing to take the second dose had preference for Johnson and Johnson a once dose only vaccine.(table 4.3).Below are some of their views:

"Concerns about safety" 27-year-old clinician

"Perceived low risk of getting Covid-19" 27-year-old nurse

"Because of adverse side effects" 25-year-old clinician

"I believe that a single jab is enough to boost immunity" 32-year-old nurse

"It was a once / single dose drug" 31-year-old nurse

Table 4.3: Proportion of HCWs not willing to take Second dose of Vaccine

Vaccine type	Total	Willingness for second dose	
		No	Yes
AstraZeneca	163(64.4%)	0	163(100%)
Moderna	22(8.7%)	0	22(100%)
Johnson & Johnson	53(20.9%)	7(13.2%)	46(86.8%)
Pfizer	15(5.9%)	0	15(100%)
Total	**253(100%)**	**7(2.8%)**	**246(97.2%)**

4.3 Adherence to WHO Covid-19 Protocols after Vaccination

The HCWs were asked their views on relaxing the four domains of Covid-19 infection prevention and control protocols after receiving the vaccine. Over thirty percent ,96(37.5%) percent agreed that handwashing could be relaxed after being Covid-19 vaccinated. About half of the HCWs, 130(51%) agreed that it was not necessary to avoid crowds after receiving vaccine and over forty percent agreed that donning of masks, 123(48%) and social distancing, 112(43.8%) was not necessary after receiving Covid-19 vaccine. (Table 4.4)

Table 4.4: Adherence to WHO Covid-19 protocols after vaccination.

Variable			Agree (%)	Disagree (%)	P value
Handwashing		Nursing Officer	67(39.2%)	104(60.8%)	0.431
		Clinical Officer	29(34.1%)	56(65.9%)	
		Overall	96(37.5%)	160(62.5%)	
Avoiding crowds		Nursing Officer	90(52.9%)	80(47.1%)	0.376
		Clinical Officer	40(47.1%)	45(52.9%)	
		Overall	130(51%)	129(49%)	
Donning masks		Nursing Officer	83(48.5%)	88(51.5%)	0.823
		Clinical Officer	40(47.1%)	45(52.9%)	
		Overall	123(48%)	133(52%)	

Social distancing		Nursing Officer	75(43.9%)	96(56.1%)	0.96
		Clinical Officer	37(43.5%)	48(56.5%)	
		Overall	112(43.8%)	144(56.3%)	

CHAPTER FIVE: DISCUSSION

Health care workers (HCWs) are the first point of contact for those seeking healthcare services and they act as role models for communities with regards to attitudes towards Covid-19 vaccination. Thus, hesitancy (delay in acceptance or refusal of vaccination despite availability of vaccination services) of HCWs towards any vaccination of public interest can crucially affect the efforts aiming to contain any pandemic. Previously published studies on Covid-19 vaccine acceptance have inadequately paid special attention to healthcare workers. In this study, level of vaccine uptake, compliance and adherence to Covid-19 protocols post vaccination among healthcare workers in Homabay Town Sub County, Homabay county were investigated.

5.1 The uptake of Covid-19 vaccine

This study showed that 98.8% of HCWs took up the vaccine, this is contrary to a study by Martin Ackah *etal* 2022 on Covid-19 acceptance among HCWs in Africa where the pooled estimated Covid-19 acceptance rate was 37% in North Africa, 28% in Central Africa, 48% in West Africa, 49% in East Africa, and 90% in Southern Africa.(Ackah et al., 2022)

Over sixty percent, 163(64.4%) of the HCWs took AstraZeneca vaccine similar to a study by Shah et al 2022 that showed more than half (61.9%) reported getting the AstraZeneca vaccine; the first vaccine available in Kenya. Also, a recent study done in Kenya involving online survey given to general adult population in six different healthcare facilities between November 2021 and January 2022 reported that 72.2% of those vaccinated had received full vaccination.(Shah et al., 2022) Possible reasons for the sharp contrast to previous findings could be due to increased supply of vaccines and accelerated roll out and increased priority to this group of healthcare workers within this time period. Another possible reason for the difference to previous findings could be due to the fact that this study focussed on two cadres of HCWs (Nurses and clinical officers) who mostly directly handle Covid-19 patients.

Given the rapidly changing information on Covid-19 disease, most recent updates are needed of which this study addresses, especially when Covid-19 vaccine fears had been addressed coupled with the increased availability of evidence-based data and increased supply of a variety of vaccines, more HCWs might have now become non-hesitant to vaccination. Indeed, this study focussed on two cadres of frontline HCWs who mostly deal directly with patients at a tertiary level facility hence this difference in study population characteristics could account for

the high uptake of vaccine in this study population. This study showed that 64.4% of healthcare workers received AstraZeneca vaccine, the first vaccine to be rolled out in Kenya. Gender was significantly associated with vaccine hesitancy ($p<0.043$). More female healthcare workers received vaccine compared to male healthcare workers. This finding is similar to a study on Covid-19 vaccine uptake roll out in the first month in Saudi Arabia where 66.5% of females were vaccinated and 59.2% were nurses.(Barry et al., 2021) However, age category, Cadre, education level, religion, marital status and facility level were not significantly associated with vaccine uptake.

5.2 Compliance with the Covid-19 vaccine

1.2% of the respondents were hesitant to take the vaccine after more than one year (18 months) of rollout. The study findings show a much lower rate of vaccine hesitancy in sharp contrast to previous findings. As at 25th November 2021, a preliminary analysis by World Health Organization (WHO) showed that only 27% of health workers in Africa had been fully vaccinated against Covid-19 (OKA, 2021). Another study involving a self-administered online survey between 16 January to 15 February 2021 showed that only 39.3% of HCWs intended to receive the vaccine. However, this study was done way back in earlier when vaccines were initially being introduced into the market for the first time in contrast to our study (Agyekum et al., 2021).

While this study population generally showed good uptake of Covid vaccine the minority that showed hesitancy and those who failed to comply by not taking all required doses had their reasons for non-compliance. The HCWs stated vaccine side effects, safety concerns and low risk of getting Covid-19 as reasons for lack of vaccination. Those who did not take the second dose mentioned adverse side effects and some stated taking a vaccine that is only administered once (a single/ one dose only Covid-19 vaccine) as reasons for not going for the second dose. However, this group that took once dose only vaccine is taken to have complied. It could be true that fear of side effects could have prevented complete compliance to vaccination or not going for vaccinations at all. This is well reflected in a Finland study about acceptance of Covid-19 vaccine which showed complacency and worry about side effects were the main reasons against vaccination while concern about severe disease was a strong motive for vaccination (Hammer, 2021). Another study reported that 40.5% of respondents reported being hesitant to take the vaccine primarily due to side effects (Shah et al., 2022) Similarly, an Indian study showed that a significant proportion of eligible candidates had not turned up for their

second dose of vaccine despite immense efforts made to develop a safe and effective vaccine (E.A. Harrison, 2020).

5.3 Level of adherence to Covid-19 protocols after vaccination

The healthcare workers were asked their views on relaxing adherence to Covid-19 infection prevention and control protocols after receiving the vaccine.37.5% agreed that handwashing could be relaxed after being Covid-19 vaccinated.51% agreed that it was not necessary to avoid crowds after receiving vaccine and 48% agreed that donning of masks and social distancing was not necessary after receiving Covid-19 vaccine. This is similar to a study that showed that a significant proportion (49.86%) of healthcare workers did not adhere to Covid-19 mitigation measures (Aemro et al., 2022). The Covid-19 measures such as travel bans, quarantine, social distancing, donning of masks have since been lifted, two and half years after start of the pandemic, driven by recognition that vaccination has helped in reduction of the number of cases of Covid globally and the current conditions of Covid infection are very different from the way it started. However there still remains a need for the population to protect themselves from Covid and in general, other infections through observation of handwashing and also donning of masks in high transmission areas such as hospitals.

In this study, perception on effectiveness and safety of vaccine, riskiness of Covid-19 disease if not vaccinated appeared to be a significant factor in the uptake of vaccines among the HCWs. It was also observed that respondents who were willing to recommend their family to go for vaccination also took the vaccination initiative themselves. This is similar to a study that showed that participants who believed that general vaccines were safe, and that pharmaceutical companies develop safe and effective vaccines were more likely to have received a vaccine compared to those who believed in the contrary (Shah et al., 2022). In this study, underlying medical condition was not a significant predictor of vaccine hesitancy. The need for the second dose to be considered to be fully vaccinated and recommending family members to go for vaccination were significantly associated with vaccine hesitancy ($p<0.05$). The provision of Covid-19 vaccine in a healthcare facility where one worked, awareness of ongoing vaccination and working in Covid-19 isolation centre were not significantly associated with vaccine hesitancy ($p>0.05$). Moreover, having received a training on Covid-19 disease and vaccination process, working in isolation centre and awareness of ongoing Covid-19 vaccination appeared not to be associated with uptake of Covid-19 vaccine. Having a colleague who has tested

positive of Covid-19 and having managed a patient with Covid-19 infection were not significantly associated with vaccine hesitancy.

In bivariate logistic regression analysis of factors associated with vaccine hesitancy, healthcare workers were significantly more likely to be Covid-19 vaccine non-hesitant if they said they could recommend their family members to go for vaccination compared to those who said they could not recommend their family members to go for vaccination (OR: 166.6; 95% CI, 11.6–2374.8, p <0.0001). Those who thought Covid-19 vaccines are effective were significantly more likely to be vaccine non-hesitant compared to those who said no (98.8; 95% CI, 7.64–1276.17, p< 0.0001). However, the wide confidence interval could be explained by the relatively small sample size in this study thus need for a study with a larger cohort of HCWs. In multivariate logistic analysis, none of the variables could fit in the model due to collinearity of variables. As per a systematic review of factors are associated with vaccine hesitancy, determinants of vaccine hesitancy were found to be complex and context specific varying across time, place and vaccines. (Larson et al., 2014)

This study had strengths and limitations. One of the strengths is that it stratified vaccine hesitancy in terms of timeline. This allowed observation of hesitancy within various time periods. To the best of our knowledge this is the first study to characterize hesitancy with regards to timeline. One of the limitations was that study population was only two cadres of healthcare workers specifically clinical officers and nurses. HCWs attending directly to patients may be more likely to perceive a need to get the vaccine given their knowledge and training on Covid-19 virus. Hence this study might not be truly reflective of the general population of all healthcare cadres in Kenya. Secondly the survey was only conducted in Homabay town sub county hence making generalization of these results difficult. Thirdly even though the data was collected anonymously, some healthcare workers might not have disclosed their true vaccination status for fear of being reprimanded. A study involving a larger cohort of HCWs in various facilities is therefore suggested.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

1.In conclusion, the Covid-19 vaccine was highly accepted with good uptake, gender played a role in the uptake where most females took up the vaccine as compared to males. However, there was delay in time to acceptance of the Covid-19 vaccine.

2.Non-compliance to the vaccine was very low and most HCWs went for the subsequent doses and of those that did not go for the second doses took up a single dose vaccine i.e. Johnson and Johnson vaccine.

3.Overrally, WHO Covid-19 prevention protocols were not adequately observed by the HCWs.

6.2 Recommendations

6.2.1 Recommendation for action

To County Government of Homabay, rolling out any vaccination drive that is targeting HCWs will have a good uptake however, alot of efforts and emphasis should be put to focus on the male gender since from this study, more females went for the Covid-19 vaccine as compared to their male counterparts

6.3.2 Recommendation for future research

For future research, there's need to conduct other studies on vaccine acceptance involving a larger cohort of all healthcare cadres to get a clear picture of vaccine acceptance among general population of healthcare workers. Also, a different approach could be used in conducting the study for example having the WHO Covid-19 prevention protocols be done as an observational study to document the actual practice.

REFERENCES.

Abeya, S. G., Barkesa, S. B., Sadi, C. G., Gemeda, D. D., Muleta, F. Y., Tolera, A. F., Ayana, D. N., Mohammed, S. A., Wako, E. B., Hurisa, M. B., Bayisa, D. A., Sarbesa, M. K., Yesuf, E. Y., & Tufa, A. A. (2021). Adherence to COVID-19 preventive measures and associated factors in Oromia regional state of Ethiopia. In *PLoS ONE* (Vol. 16, Issue 10 October 2021). https://doi.org/10.1371/journal.pone.0257373

Ackah, M., Ameyaw, L., Salifu, M. G., Asubonteng, D. P. A., Yeboah, C. O., Annor, E. N., Ankapong, E. A. K., & Boakye, H. (2022). COVID-19 vaccine acceptance among health care workers in Africa: A systematic review and meta-analysis. *PLoS ONE*, *17*(5 May), 1–15. https://doi.org/10.1371/journal.pone.0268711

Aemro, A., Fentie, B., & Wassie, M. (2022). Adherence to Covid-19 mitigation measures and its associated factors among health care workers at referral hospitals in Amhara regional state of Ethiopia. *PLoS ONE*, *17*(8 August), 1–13. https://doi.org/10.1371/journal.pone.0272570

Agyekum, M. W., Frempong Afrifa-Anane, G., Kyei-Arthur, F., Addo, B., & Author, C. (2021). Acceptability of COVID-19 vaccination among health care workers in Ghana. *MedRxiv*.

Ar, -Aliae, & Hussein, M. (2021). A national survey of potential acceptance of COVID-19 vaccines in healthcare workers in Egypt. *MedRxiv*.

Barry, M., Temsah, M. H., Aljamaan, F., Saddik, B., Al-Eyadhy, A., Alenezi, S., Alamro, N., Alhuzaimi, A. N., Alhaboob, A., Alhasan, K., Alsohime, F., Alaraj, A., Halwani, R., Jamal, A., Temsah, O., Alzamil, F., Somily, A., & Al-Tawfiq, J. A. (2021). COVID-19 vaccine uptake among healthcare workers in the fourth country to authorize BNT162b2 during the first month of rollout. In *Vaccine* (Vol. 39, Issue 40, pp. 5762–5768). https://doi.org/10.1016/j.vaccine.2021.08.083

Berry, S. D., Johnson, K. S., Myles, L., Herndon, L., Montoya, A., Fashaw, S., & Gifford, D. (2021). Lessons learned from frontline skilled nursing facility staff regarding COVID-19 vaccine hesitancy. *Journal of the American Geriatrics Society*. https://doi.org/10.1111/jgs.17136

Centers for Disease Control and Prevention. (2020). Symptoms of Coronavirus (COVID-19). *Cdc*.

Chersich, M. F., Gray, G., Fairlie, L., Eichbaum, Q., Mayhew, S., Allwood, B., English, R., Scorgie, F., Luchters, S., Simpson, G., Haghighi, M. M., Pham, M. D., & Rees, H. (2020). Covid-19 in Africa: Care and protection for frontline healthcare workers. In *Globalization and Health*. https://doi.org/10.1186/s12992-020-00574-3

Chong, P. Y., & Yin, H. (2020). System dynamics simulation on spread of COVID-19 by traffic and transportation. *Jiaotong Yunshu Gongcheng Xuebao/Journal of Traffic and Transportation Engineering*. https://doi.org/10.19818/j.cnki.1671-1637.2020.03.009

Daas, C. Den, Hubbard, G., Johnston, M., DIxon, Di., Allan, J., Cristea, M., Davis, A., Dobbie, F., Fitzgerald, N., Fleming, L., Fraquharson, B., Gorely, T., Gray, C., Grindle, M., Harkess-Murphy, E., Hunt, K., Ion, R., Kidd, L., Lansdown, T., … Wyke, S. (2021). Protocol of the COVID-19 Health and Adherence Research in Scotland (CHARIS) study: Understanding changes in adherence to transmission-reducing behaviours, mental and general health, in repeated cross-sectional representative survey of the Scottish populat. *BMJ Open*, *11*(2), 1–8. https://doi.org/10.1136/bmjopen-2020-044135

Duchmann, R. (2020). COVID-19 COVID-19 COVID-19 COVID-19 COVID-19 COVID-19. *Endo-Praxis*. https://doi.org/10.1055/a-1229-5048

Elhadi, M., Alsoufi, A., Alhadi, A., Hmeida, A., Alshareea, E., Dokali, M., Abodabos, S., Alsadiq, O., Abdelkabir, M., Ashini, A., Shaban, A., Mohammed, S., Alghudban, N., Bureziza, E., Najah, Q., Abdulrahman, K., Mshareb, N., Derwish, K., Shnfier, N., … Msherghi, A. (2021). Knowledge, attitude, and acceptance of healthcare workers and the public regarding the COVID-19 vaccine: a cross-sectional study. *BMC Public Health*, *21*(1). https://doi.org/10.1186/s12889-021-10987-3

ERKEKOĞLU, P., ERDEMLİ KÖSE, S. B., BALCI, A., & YİRUN, A. (2020a). Vaccine Hesitancy and Effects of COVID-19. *Journal of Literature Pharmacy Sciences*. https://doi.org/10.5336/pharmsci.2020-76102

ERKEKOĞLU, P., ERDEMLİ KÖSE, S. B., BALCI, A., & YİRUN, A. (2020b). Vaccine Hesitancy and Effects of COVID-19. *Journal of Literature Pharmacy Sciences*, *9*(2), 208–220. https://doi.org/10.5336/pharmsci.2020-76102

Freeman, D., Loe, B. S., Chadwick, A., Vaccari, C., Waite, F., Rosebrock, L., Jenner, L., Petit, A., Lewandowsky, S., Vanderslott, S., Innocenti, S., Larkin, M., Giubilini, A., Yu, L. M., McShane, H., Pollard, A. J., & Lambe, S. (2021). COVID-19 vaccine hesitancy in the UK: The Oxford coronavirus explanations, attitudes, and narratives survey (Oceans) II. *Psychological Medicine*. https://doi.org/10.1017/S0033291720005188

Gagneux-Brunon, A., Detoc, M., Bruel, S., Tardy, B., Rozaire, O., Frappe, P., & Botelho-Nevers, E. (2021). Intention to get vaccinations against COVID-19 in French healthcare workers during the first pandemic wave: a cross-sectional survey. *Journal of Hospital Infection*, *108*. https://doi.org/10.1016/j.jhin.2020.11.020

Jain, J., Saurabh, S., Goel, A. D., Gupta, K., Bhardwaj, P., & Raghav, P. R. (2021). Title: COVID-19 vaccine hesitancy among undergraduate medical students: results 2 from a nationwide survey in India. *MedRxiv*.

Kannan, S., Shaik Syed Ali, P., Sheeza, A., & Hemalatha, K. (2020). COVID-19 (Novel Coronavirus 2019) - recent trends. *European Review for Medical and Pharmacological Sciences*. https://doi.org/10.26355/eurrev_202002_20378

Kumari, A., Ranjan, P., Chopra, S., Kaur, D., Kaur, T., Upadhyay, A. D., Isaac, J. A., Kasiraj, R., Prakash, B., Kumar, P., Dwivedi, S. N., & Vikram, N. K. (2021). Knowledge, barriers and facilitators regarding COVID-19 vaccine and vaccination programme among the general population: A cross-sectional survey from one thousand two hundred and forty-nine participants. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, *15*(3), 987–992. https://doi.org/10.1016/j.dsx.2021.04.015

Larson, H. J., Jarrett, C., Eckersberger, E., Smith, D. M. D., & Paterson, P. (2014). Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007-2012. In *Vaccine* (Vol. 32, Issue 19, pp. 2150–2159). Elsevier BV. https://doi.org/10.1016/j.vaccine.2014.01.081

Lazarus, J. V., Ratzan, S. C., Palayew, A., Gostin, L. O., Larson, H. J., Rabin, K., Kimball, S., & El-Mohandes, A. (2021). A global survey of potential acceptance of a COVID-19 vaccine. *Nature Medicine*. https://doi.org/10.1038/s41591-020-1124-9

Lucia, V. C., Kelekar, A., & Afonso, N. M. (2020). COVID-19 vaccine hesitancy among medical students. *Journal of Public Health*. https://doi.org/10.1093/pubmed/fdaa230

MacDonald, N. E., Eskola, J., Liang, X., Chaudhuri, M., Dube, E., Gellin, B., Goldstein, S., Larson, H., Manzo, M. L., Reingold, A., Tshering, K., Zhou, Y., Duclos, P., Guirguis, S., Hickler, B., & Schuster, M. (2015). Vaccine hesitancy: Definition, scope and determinants. *Vaccine*, *33*(34), 4161–4164. https://doi.org/10.1016/j.vaccine.2015.04.036

Malik, A. A., McFadden, S. A. M., Elharake, J., & Omer, S. B. (2020). Determinants of COVID-19 vaccine acceptance in the US. *EClinicalMedicine*.

https://doi.org/10.1016/j.eclinm.2020.100495

Oliver, K., Raut, A., Pierre, S., Silvera, L., Boulos, A., Gale, A., Baum, A., Chory, A., Davis, N., D'Souza, D., Freeman, A., Goytia, C., Hamilton, A., Horowitz, C., Islam, N., Jeavons, J., Knudsen, J., Li, S., Lupi, J., … Maru, D. (2021). Factors associated with COVID-19 vaccine receipt at two integrated healthcare systems in New York City: A Cross sectional study of healthcare workers. *MedRxiv*.

Puri, N., Coomes, E. A., Haghbayan, H., & Gunaratne, K. (2020). Social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases. *Human Vaccines and Immunotherapeutics*. https://doi.org/10.1080/21645515.2020.1780846

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social Learning Theory and the Health Belief Model. In *Health Education & Behavior* (Vol. 15, Issue 2, pp. 175–183). https://doi.org/10.1177/109019818801500203

Shah, J., Abeid, A., Sharma, K., Manji, S., Nambafu, J., Korom, R., Patel, K., Said, M., Mohamed, M. A., Sood, M., Karani, V., Kamandi, P., Kiptinness, S., Rego, R. T., Patel, R., Shah, R., Talib, Z., & Ali, S. K. (2022). Perceptions and Knowledge towards COVID-19 Vaccine Hesitancy among a Subpopulation of Adults in Kenya: An English Survey at Six Healthcare Facilities. *Vaccines*, *10*(5), 1–15. https://doi.org/10.3390/vaccines10050705

Sohrabi, C., Alsafi, Z., O'Neill, N., Khan, M., Kerwan, A., Al-Jabir, A., Iosifidis, C., & Agha, R. (2020). World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). In *International Journal of Surgery*. https://doi.org/10.1016/j.ijsu.2020.02.034

Wang, M. W., Wen, W., Wang, N., Zhou, M. Y., Wang, C. Y., Ni, J., Jiang, J. J., Zhang, X. W., Feng, Z. H., & Cheng, Y. R. (2021). COVID-19 Vaccination Acceptance Among Healthcare Workers and Non-healthcare Workers in China: A Survey. *Frontiers in Public Health*, *9*(August), 1–8. https://doi.org/10.3389/fpubh.2021.709056

World Health Organization. (2020). Q&A on coronaviruses (COVID-19). In *Who*.

European Parliament. (19 April 2018)). Vaccine hesitancy. *European Parliament*, t (2017/2951 RSP). https://www.europarl.europa.eu/doceo/document/TA-8-2018-0188_EN.pdf (2018).,.

Aemro, A. A. (2022). Determinants of COVID-19 vaccine hesitancy among health care workers in Amhara region referral hospitals, Northwest Ethiopia: A cross-sectional study. *Epidemiology and Infection*.

E.A. Harrison, J. W. (2020). Vaccine confidence in the time of COVID-19. *Eur J Epidemiol, 35 (4) (2020), pp. 325-330*, 325-330.

Fadda, M. A. (2020). When a COVID-19 vaccine is ready, will we all be ready for it? . *Int. J. Public Health 65,*, 711–712.

Fisher KA, B. S. (September 4,2020). Attitude towards potential SARS-CoV-2 vaccine. *Ann Intern Med*.

Hammer, C. C. (2021). High but slightly declining COVID-19 vaccine acceptance and reasons for vaccine acceptance, Finland April to December 2020. *Epidemiology and Infection, 149, E123. doi:10.1017/S0950268821001114*, 149.

J.V. Lazarus, S. R. (2021). A global survey of potential acceptance of a COVID-19 vaccine. *Nat Med, 27 (2)* , 225-228.

Kagwe, M. (2021, July 7). Retrieved from https://portal.health.go.ke

Lane, S. M. (2015–2017.). Vaccine hesitancy around the globe: analysis of three years. *WHO/UNICEF Joint Reporting Form data—Vaccine 36,* , 3861–3867 (2018).

Mutahi, K. (June 2022). *Situational Covid Report* . Nairobi.

OKA, S. (2021). *Africa Health* .

Reiter PL, P. M. (2020). Acceptability of a COVID-19 vaccine among adults in the United States:. *how many people would get vaccinated? Vaccine 2020;38(42):6500–7.*, 38.

Schaffer DeRoo S, P. N. (2020). Planning for a COVID-19 vaccination program. . *JAMA 2020;.* , 323(24):2458–9.

WHO. (2022, June 3RD). Covid 19 updates.

WHO. (2022, June 3rd). *Covid 19 Updates.*

WHO. (2022). *Covid 19 Updates.*

Appendix i: Informed Consent

Study Title: Covid-19 vaccine acceptance and compliance among health care workers in Homabay town sub county, Homabay County

Principal Investigator: CHRISTINE AKOTH

MOBILE NO: +254727787977 Email Address: christie142@gmail.com

Study Funder: Self/Sponsored

Introduction

Dear participant, I am undertaking Master's degree in Public Health (Epidemiology and Disease Control) in the School of Health Sciences at Jaramogi Oginga Odinga University of Science and Technology conducting a study on the *Covid-19 vaccine acceptance and compliance among the Health Care Workers in Homabay town Sub County.* Kindly note that this is an academic exercise and the information that you provide will be treated with utmost confidentiality.

Study Background

Covid-19 disease is a communicable disease of great public health concern worldwide and much is unknown about it. Currently, there is no known treatment or cure except for prevention by vaccines. If everyone is to be vaccinated, then the transmission of this virus from one person to the other would be prevented or, even lessen the symptoms of the disease for those infected. HCWs are the major drivers to the spread of Covid-19 since they handle Covid-19 infected persons and also interact with their family members. This makes HCW to be at risk to the community at large.

According to a survey conducted in USA on medical students in a university, 25% of them were hesitant to be vaccinated as soon as an FDA-approved vaccine became available despite self-perception of elevated risk of exposure to Covid-19 infection. Another study done in Kenya in January 2021before availability of Covid vaccine by Masika *etal* on acceptability of Covid 19 among HCW showed that 29% of HCW would decline it but this was before availability of vaccine .This is different from previous studies that showed risk perception as a central predictor of protection intentions and preventive health behaviours (Lucia et al., 2020). Given the low acceptability as earlier reported, the government of Kenya enhanced campaign to improve the acceptability by HCW however, there has been no evaluation of the improvement of the acceptability and compliance. This study therefore will assess the

acceptance, compliance and adherence to Covid protocol among HCWs in Homabay Town Sub county.

Purpose

You are invited to participate in this survey that seeks to assess Covid-19 vaccine acceptance and compliance among HCW. You are invited because you are a health care worker and working in Homabay Town Sub County.

Study duration

The study shall be conducted within a period of 1 month since it's an online survey thereafter data shall be analyzed.

Study Procedure

Data will be collected through Google Form and key informant interviews.

The web link will be sent by investigators to the participant's personal and social contacts via WhatsApp messenger. Data shall be collected over a period of 4 weeks then summarized for analysis.

Risks/discomfort

The study is not associated with any risk since participation in this study will not involve any invasive procedure.

All study documents will be secured and will only be accessible to authorized study personnel.

Benefits

There is no direct benefit for participating in the study, but the findings of the study will be used to enhance Covid-19 vaccine uptake especially in identifying the key factors that contributed to hesitancy and non-compliance.

Compensation

There is no direct compensation or benefits for participating in this study however airtime worth ksh.50 will be reimbursed for bundles used.

Voluntariness

Participation is voluntary. There is no penalty for refusing to participate if you choose not to. You can withdraw at any point during the study. You may also decline to answer any question that you do not wish to. Any such decision will not interfere with any benefits that are due to you as a participant in this study.

Confidentiality

Electronic files will be saved on Password. There will be no way to identify individual participants. We will not identify you or use any information that would make it possible for anyone to identify you in any presentations or written reports.

Questions

In case of questions about the content of this study or have been offended as a result of being in this study you may call or email the investigator Christine Akoth, on +254727787977 or christie142@gmail.com If you have any questions about your rights as study participant you can contact the Jaramogi Oginga Odinga Teaching and Referral Hospital - Kisumu Ethics Committee, on ercjootrh@gmail.com

Consent statement

I have read and understood this consent form. The risks and benefits of being in the study have also been clearly explained to me. I have chosen freely to take part in the study and I can also choose to opt out of the study at any time. It has been explained to me that my personal information will not be shared with anyone except the authorized study personnel.

If there is any part of this consent agreement that you do not understand, please talk the researcher before signing

Are you willing to participate in this study?

Circle clearly Yes No If yes, please sign below:

Participant Name: ……. Sign: …..…… Date……

Researcher's Name: …….....Sign: ……...…… Date……

Appendix ii: Questionnaire (V1.1)

TITLE: TO ASSESS COVID-19 VACCINE HESITANCY AMONG HEALTH CARE WORKERS IN HOMABAY TOWN SUB COUNTY

SCETION A: SOCIO-DEMOGRAPHIC DATA

Q 1. Do you consent to participate in this survey?

a) Yes
b) No

Q 2 What is your age in years……....

Q 2.2 What is your gender?

a) Female
b) Male

Q 2.3 What is your cadre (please tick one)

a) Clinical officer
b) Nursing Officer

Q 2.4 What is your marital status

a) Single
b) Married
c) Divorced
d) Widow
e) Separated

Q 2.5 Which is your religion?

a) Christian
b) Muslim
c) Prefer not to say

Q 2.6 What is your level of education?

a) Nurse-BSc
b) Nurse-Diploma
c) Nurse-Certificate
d) Clinical officer-BSc
e) Clinical Officer-Diploma
f) Clinical officer specialist

SECTION B

Uptake level, Compliance and Adherence to Covid-19 Protocols.

Q 3.1 Does your Health facility provide Covid-19 vaccination?

a) Yes
b) No

Q 3.2 Are you aware of the ongoing Covid-19 Vaccination?

a) Yes
b) No

Q 3.21 If yes, can you recommend your any member of your family to go for the vaccine?

a) Yes
b) No

Q 3.3 Did you receive Covid-19 Vaccine?

a) Yes
b) No if no, *(go to 3.7)*

Q 3.31 which type of Covid-19 vaccine did you receive?

a) AstraZeneca
b) Johnson and Johnson
c) Moderna
d) Pfizer
e) Sinopharm
f) Other, specify
g) Don't know

Q 3.311 If yes approximately when did you receive the first vaccine since roll out (It was rolled out for HCW in March 2021) ……...

Q 3.312 Currently how many rounds of vaccines have you received?

a) First round
b) Second round
c) Both
d) Booster

Q 3.4 Did you experience any adverse event post vaccination?.....

Q 3.41 If yes could you please state them……...

Q 3.411 How convenient was it for you to get the Covid-19 vaccines?

a) Extremely convenient
b) Somewhat convenient
c) A little convenient
d) Not convenient

Q 3.42 Do you think after Covid vaccination you can relax or avoid following the WHO guidelines on Covid in a scale of 1 to 5 (where 1 is strongly disagree and 5 is strongly agree.)

	Strongly Disagree	Disagree	Undecided	Agree	Strongly agree
Hand washing					
Social Distancing					
Masking up					
Avoiding crowds					

Q3.5 Do you think the Covid-19 vaccines are safe?

a) Strongly agree
b) Agree
c) Disagree
d) Strongly disagree
e) Not sure

Q3.6 Do you think the Covid-19 vaccines are effective?

a) Yes
b) No

Q 3.7 If no why didn't you go for the vaccine?

a) Because of the side effects
b) Because of its availability
c) Concerns about Safety
d) Perceived low risk of getting Covid-19
e) Underlying medical condition
f) I was engaged or was committed somewhere
g) Others, please specify

Q 3.71 How risky do you think Covid infection is if not vaccinated?

a) Very risky
b) Moderately risky
c) Not risky

Q 3.8 If you took the 1st dose of Covid-19 vaccine will you go for the 2nd dose?

a) Yes
b) No
c) Don't know

Q 3.81 If no why.....

Q 4.1 Do you work at an isolation Centre for Covid-19

a) Yes
b) No

Q 4.2 What level of Health facility do you work at?

a) Dispensary
b) Sub county Hospital
c) County Hospital
d) Referral Hospital

Q4.3 Has any of your colleagues tested positive for Covid

a) Yes
b) No

Q 4.4 As a HCW, did you receive any training on Covid-19 and the vaccination process?

a) Yes
b) No

Q 4.5 If yes above, did the training change your perception or view to Covid-19 vaccination?

a) Yes
b) No

Q. 4.2 If No, what do you think should have been done right to improve the outcome?

Thank you for participating in the survey, would you like to be reimbursed airtime to cover for your internet cost?

a) Yes
b) No

If yes please share your telephone number for reimbursement……...**END.**

Appendix iii: Key Informant Interview Tool

I am Christine Obinju Akoth, a postgraduate student from Jaramogi Oginga Odinga University of Science and technology conducting a study on assessing the Covid-19 vaccine hesitancy among Health care workers in Homabay town Sub County, Homabay County.

The study is seeking to assess Covid-19 vaccine Acceptance, compliance and level of adherence to WHO Covid protocols post vaccination among HCWs in Homabay Town sub county.

This study through data collected and analysed will provide insights into the Health Care Workers perception for the low uptake and evidence-based information on how to scale the vaccination uptake. Their acceptance of Covid-19 vaccination will influence the uptake of this vaccine within the general population as they are a reliable source of information which will in turn help in combating this Covid pandemic.

Facilitator's Notes

Administer the questionnaire using the relevant sections only.

Introduce the purpose of the discussion (Covid -19 vaccine hesitancy among HCW)

Obtain Informed Consent (verbal)

Guided by research objective

Key Informant Interview Questionnaire for Sub county Public Health Nurse, Sub county clinical officer and Sub county vaccines coordinator.

Questions

1. What do you say about the acceptance of Covid-19 vaccine among HCW in Homabay town Sub County?
2. Why do think some of the HCW are not ready to go for the vaccine?
3. What do you think should be done to improve on the uptake?
4. Which fake news from the social media do you think has influence on the uptake?
5. With the adverse events such as death what information would you recommend to be given to the HCWs?
6. What do you think should be done to the HCW who have refused to go for the vaccination?

7. Could you please share with me challenges that were encountered with the provision of vaccine in Homabay town Sub County?
8. What are the effects of the vaccination on incidences of Covid-19 infection among the Health Care Workers?
9. Personally, could you share with me any reservations or concerns you have about the vaccine.

Appendix iv: Authority to Collect Data

DEPARTMENT OF HEALTH

Telegrams: "MOH" Homa Bay
Telephone: 21039
When replying please quote
homabaychc@gmail.com

MINISTRY OF HEALTH
HOMA BAY COUNTY
P.O. BOX 52
HOMA-BAY.

Ref: MOH/HB/CTY/RA /VOL.VI/156

1st August, 2022

Christine Obinju Akoth
P O Box 4826 – 40100
KISUMU

RE: AUTHORITY TO COLLECT DATA

Your request to collect data on your research title **"The Covid 19 vaccine Hesitancy among Health Care Workers in Homa Bay Town Sub County Homa Bay - Kenya"** has been approved with effect from 1st August, 2022 to 31st July, 2023.

You will be required to adhere to the hospital's norms regulations and you are also expected to communicate your findings to the Directors' Office at the end of the research period.

Wish you all the best in your study.

DEPARTMENT OF HEALTH SERVICES,
COUNTY DIRECTOR OF HEALTH
01 AUG 2022
P. O. BOX 52 - 4300, HOMA BAY - KENYA

Dr. Gordon Okomo
County Director of Health Services
HOMA BAY COUNTY

Appendix v: Introductory Letter to the ERC

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF HEALTH SCIENCES

INTERNAL MEMO

TO: Director, Board of Postgraduate Studies **DATE:** 11 /02/2022

FROM: Postgraduate Coordinator - SHS **REF:** JOOUST/SHS/216

SUBJECT: ETHICAL APPROVAL (Christine Obinju Akoth - H152//4193/17)

The above matter refers.

This is to verify that the above mentioned is a postgraduate student in JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY in the School of Health Sciences undergoing a course leading to MASTER OF SCIENCE In Public Health (Epidemiology and Disease Control)

She has completed his course work. On 29th October, 2021, at departmental level, she defended her proposal. After working on the comments given and with the approval of her supervisors as evidenced in the signed proposal, the title is *"Covid 19 vaccine hesitancy among healthcare workers in Homabay Town Sub County"*.

The purpose of this letter therefore is to request you to write her an introductory letter so that she can submit her proposal for ethical approval at JOOUST Ethics Committee.

Attached is the abstract and copy of a proposal for your action.

Thank you.

Esther Osir, PhD
Postgraduate Coordinator
School of Health Sciences

Copied, Dean, SHS

Appendix vi: Ethical Review Report

COUNTY GOVERNMENT OF KISUMU
DEPARTMENT OF HEALTH

Telephone: 057-2020801/2020803/2020321
Fax: 057-2024337
E-mail: medsuptnpgh@yahoo.com
ceo@jaramogireferral.go.ke
Website: www.jaramogireferral.go.ke
When replying please quote

JARAMOGI OGINGA ODINGA TEACHING & REFERRAL HOSPITAL
P.O. BOX 849
KISUMU

Ref. No. IERC/JOOTRH/601/22

14th July, 2022
Date.....

To: Christine Obinju Akoth

Dear Christine,

Supervisors – George Ayodo & Prof Romuald Jozef Sciborski

RE: APPROVAL: STUDY TITLE
THE COVID-19 VACCINE HESITANCY AMONG HEALTH CARE WORKERS IN HOMABAY TOWN SUB COUNTY, HOMABAY COUNTY, KENYA

REF: IERC/JOOTRH/601/22

RE: STUDY TITLE

This is to inform you that JOOTRH ISERC has reviewed and approved your above research proposal. Your application approval number is ***IERC/JOOTRH/601/22.*** The approval period is ***14th July, 2022 to 14th July, 2023.***

This approval is subject to compliance with the following requirements;

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

1

viii. Submission of an executive summary report within 90 days upon completion of the study to JOOTRH ISERC.

ix. In case the study site is JOOTRH, kindly report to Chief Executive Officer before commencement of data collection.

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

Yours sincerely,

ANTONY AYORA
SECRETARY – ISERC
JOOTRH - KISUMU

Appendix vii: Research License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 730034

Date of Issue: 28/July/2022

RESEARCH LICENSE

This is to Certify that Miss., CHRISTINE OBINJU AKOTH of Jaramogi Oginga Odinga University of Science and Technology, has been licensed to conduct research in Homabay on the topic: THE COVID-19 VACCINE HESITANCY AMONG HEALTH CARE WORKERS IN HOMABAY TOWN SUB COUNTY,HOMABAY-KENYA. for the period ending : 28/July/2023.

License No: **NACOSTI/P/22/19222**

730034

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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