GUARDIAN WILLINGNESS TO VACCINATE ADOLESCENT DAUGHTERS AGAINST HUMAN PAPILLOMAVIRUS FOR CERVICAL CANCER PREVENTION IN HARD-TO-REACH COMMUNITIES IN MANDERA COUNTY KENYA.

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DECLARATION

Student's Declaration

This thesis is my original work and has never been submitted for a degree at another academic institution.

Signed  Date 25/ 06/ 2024

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Declaration by supervisors

We acknowledge that the candidate under our administration is responsible for the work described in this research thesis.

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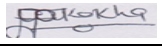
Signed  Date 25/ 06/ 2024

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DEDICATION

I dedicate my thesis to my entire family because without your help, I could not have gotten this far in my studies.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

WHO	World health organization
AIDS	Acquired immunodeficiency syndrome
CACX	Cancer of the cervix
CCSS	Cervical cancer screening services
FAD	Food and drug administration
GLOBOCAN	Global burden of cancer study
HIV	Human immuno deficiency virus
HPV	Human papilloma virus
IARC	International agency for research on cancer
IR	Incidence rate
KDHS	Kenya demographic health survey
KFS	Kenya Fact Sheet
LMICS	Low and middle income countries

ABSTRACT

With an estimated 604,127 (3.1%) new cases of cervical cancer and 342,831 (3.4%) fatalities globally in 2020, cervix cancer is the fourth most frequently diagnosed cancer in women. In Kenya cervical cancer was majorly linked to Human Papillomavirus (HPV), accounting for 12.4% of cases per year with an estimated 5,236 diagnosed cases and approximately 3,211 (11.9%) death attributed to those cases. Vaccination with Human papilloma Virus (HPV) Vaccine has been taunted as one of the main strategy in curbing the disease. However, its utilization has been low, especially among the hard to reach communities. Finding out whether parents are willing to immunize teenage girls against the Human Papillomavirus (HPV) was the main objective of this study. This thesis used a cross-sectional descriptive approach and collected data through; interviews with key informants, discussions in focus groups interviews, and a pretested interviewer-administered questionnaire. Parents or guardians of teenage girls between the ages of 9 and 14 who had lived in Mandera East Sub County for at least six months prior to the study's start and gave their consent for participation in the survey were required for inclusion. A sample size of 278 was randomly selected from 5 community units that had different number of households. Using a simple method of random sampling, the households that satisfied the inclusion criteria were chosen. A structured questionnaire was used for gathering quantitative data, which was then analyzed using both descriptive methods like tables and inferential methods like chi-square tests and multiple regression analysis. Categorical data was also interpreted through pie charts and frequency tables. Focus group discussions and interviews with key Informants yielded qualitative data, which was then transcribed using thematic analysis techniques. The study's findings revealed that although guardians in the region we investigated had high awareness of the HPV vaccine (72%), they had low knowledge of it (62%), which had an impact on how well-liked it was and resulted in low utilization of the HPV vaccine. Low (30%) acceptance of HPV has been documented, with most people being resistant (54%) because of socio-cultural factors. The study also reported a correlation between socio-cultural factors and religion at a p value of 0.01. The two factors being key obstacles in acceptability of HPV vaccine among guardians. In conclusion, despite the participants having substantial awareness levels, the low uptake of the HPV vaccine has been credited to low knowledge and socio-cultural beliefs, despite the availability of healthcare services and staff with adequate training. In order to better inform the community about HPV infection, the HPV vaccine, and cervical cancer, it was advised by the study that the Ministry of Health work with the County Government and increase community education efforts. The study recognized the value of medical staff in raising community awareness of health issues related to internationalization as well as educating spiritual leaders about HPV infection in order to reach a larger audience

CHAPTER ONE

Introduction

1.1 Background to the study

This chapter entails background information on Cervical Cancer mortality across the globe, regionally and nationally, HPV vaccination and its uptake affecting females, problem statement, objectives of the study, research questions, significance of the study, scope of the study and limitations of the study. HPV vaccination uptake is hindered by social -cultural and health-related factors as they are the integral part in determining the level of acceptance of the vaccine, factors such as costs, availability of competent human resources, availability of health resources, cultural values, religion and subjective norms all have a part to play.

According to estimates from GLOBOCAN, there will be 604,000 cases that are newly diagnosed and 342,000 confirmed fatalities worldwide from cancer of the cervix in 2020. In Western Europe, Australia, and New Zealand had lower mortality rates of cervical cancer at 7 for every 100,000 and 6 for every 100,000, respectively, Eastern African nations had the highest mortality rates at 40 per 100,000. Eastern and Central Africa have the highest and most common age-standardized rates (ASRs) of cancer of the cervix, at rates of 40.1.7 and 31.6, respectively (Globocan estimates, 2020).Geographical differences in cancer of the cervix incidence were noted; in SSA, Guinea had the highest rates (48%) and Mozambique had the lowest rates (41%). By 2030, 443,000 women would have died from cancer of the cervix worldwide, with Sub-Saharan Africa and nations with low or middle incomes (LMICs) expecting the highest percentage of deaths (98%) (WHO) (Lekoane, 2019).

In Africa, there are an estimated 372.2 million girls under the age of 15 who are at risk of developing cancer of the cervix, which has an annual mortality rate of 119,284 cases and a mortality rate of 68.5%, or 81,687 deaths. 2021) (Asempah E. According to GLOBOCAN statistics projections for 2020, Kenya was expected to experience 3,211 fatalities and 5,236 new cases per year, or 12.4% of the global total. According to Karanja, Chege CM 2020, it was reported that HPV vaccination uptake in Kenya was at 33%, for the first dose, (this had a slight increase from 25% in 2019) while the second dose was reported to have a drop at 16%.

In Kenya, cancer of the cervix was found to have the most fatalities, while cancer of the breast was reported to affect more women than any other type of cancer. (According to GLOBOCAN 2020).The vast majority of these fatalities could have been prevented with better prevention knowledge, effective screening, quick diagnosis, and effective treatment. Cervical cancer in Kenya was majorly linked to Human Papillomavirus (HPV), accounting for 12.4% of cases per year with an estimated 5,236 diagnosed cases and approximately 3,211 (11.9%) death attributed to those cases (GLOBOCAN 2020) and typically the infection occurs through sexual behavior (GLOBOCAN 2020).

Estimates from the Ministry of Health, Kenya (MOHK) indicate that 3211 cases of cancer of the cervix were fatal each year, resulting in 5236 new cases, and that 16.2 million women (females aged 15 and older) were at risk for developing the disease(HPV information Centre 2021).

1.2 Problem statement

According to GLOBOCAN's estimation in 2020, cervical cases were at 604,000 and deaths were at 342,000 worldwide. In Africa, it has been projected that 372.2 million girls under the age of 15 were at risk of developing cancer of the cervix, with 119,284 being diagnosed each year and a rate of fatalities of 68.5% (81,687 deaths)(Asempah E., 2021). By 2040, globally cervical cancer fatalities will rise to 460,000 if no effective strategies will have been put in place while low-income countries like Sub-Saharan Africa will have a hard time managing the disease (WHO, 2021). In Kenya, cervical cancer represented 12% of the total cancer burden, as well as the number one killer in all the cancers, with mortality of about 3200 in 2020 (Sung H, Ferlay J, Siegel RL, et al. 2021) . According to WHO, 2017, it was reported that HPV infection prevalence rate globally was at 11.7%, Latin America and Caribbean had a prevalence rate of 16.1%, while Eastern Europe was at 21%, and Sub Saharan Africa at 24% and the highest prevalence rates were present in Eastern Africa at 33.6%.

The unveiling of the HPV vaccine had varying degrees of utilization around the world. America was at 85% as of June 2020. Europe at 77%, Oceania at 56%, in Asia at 40% & Africa at 31%. Significant regional & income level disparities were evident as per the coverage estimates of the introduction & performance of HPV vaccination program which be- littled estimations in most parts of the world. (Edina A. Dacosta, Varsetile V. Nkwinika, Viola, Chepkurui 2022). The Global HPV vaccine 1st dose uptake rose from 16% in 2021 to 21% in 2022 (WHO, 2022). According to another investigation, states' HPV uptake levels

ranged from 1.1% to 94.4%, while nations like Scotland and Taiwan had successful utilization rates of more than 80 (Loke AY, Kwan ML, Wong Y-T, Wong AKY, 2017).

About 75% of sexually active individuals become infected with the human papillomavirus (HPV) early in the course of their sexual activity. Oncogenic HPV types can cause pervasive infection, which can result in cancerous conditions like cancer of the cervix. The World Health Organization approved the use of an effective HPV vaccine in 2006 for girls between the ages of 9 and 14 to prevent conditions related to HPV(Mabeya , 2018). Although the HPV vaccine has been accessible for about 15 years, only 20% of SSA countries that are enacting the vaccination program have reached dose completion, as opposed to 77% in Australia and New Zealand. There were numerous execution obstacles that prevented sufficient coverage. Real-world HPV vaccination achievement requires methods for getting around implementation difficulties. Therefore, it was crucial to comprehend and map the execution of the techniques used in Sub-Saharan Africa to boost the uptake of HPV vaccination (Mabeya , 2018).

Girls between the ages of 9 and 13 should receive an HPV vaccine, according to the World Health Organization. In Kenya, a rollout of HPV vaccination program had been developed, which targeted girls (3,079,482) which represent 12.3% of the total female population in Kenya. (Global World Population Prospects 2017) with the goal of vaccinations for teenage girls is comparable to one that was carried out in nations like Rwanda, Uganda, Cameroon, Tanzania, Lesotho, and South Africa, which had integrated HPV vaccine in a school-based scheme. (A Helland. Br. J.Cancer 2014; Ladner et al. 2014). Several nations in sub-Saharan Africa are considering HPV vaccination because of the prevalence of helminth infections

and malaria, which act as modulators and stimulate the body's immune responses (Elliott AM, Mawa PA, Webb EL., 2010.

In Kenya, a study conducted by MOH in Kitui County in a school set up for a 2 yrs duration reported that the HPV uptake was at 96% for a population of 22,500 girls aged 9-12 yrs enrolled in grade 4. The national HPV uptake was reported at 33%, for the first dose, (this had a slight increase from 25% in 2019) while the second dose was reported to have a drop at 16%. (Karanja, Chege CM, 2020). Only 20% of the focused on girls (3.2 M) were vaccinated in West Pokot, Marsabit, Samburu, Turkana, Isiolo, Wajir, Garissa, and Mandera counties, according to reports on the inadequate use of the HPV vaccine(Standard newspaper, 2023). The investigation was beneficial because it established a baseline for decision-making in the future regarding the national rollout of the HPV vaccine, its addition to the schedule of usual vaccinations, and how to address difficulties encountered in the pilot studies. Another school-based program was reported in Rwanda in 2011 where the HPV vaccine coverage was at 95% targeting 10-14 yrs girls. (Karanja, Chege CM ,2020).To prevent cervical cancer in hard-to-reach areas in Mandera County, Kenya, this study attempted to ascertain guardian willingness to immunize teenage daughters against the human papillomavirus.

1.3 Study Broad Objective

1.3.1 Main Objective

In order to prevent cancer of the cervix in hard-to-reach communities in Mandera County, Kenya, the research's main objective was to investigate the guardians' willingness to immunize teenage daughters against the human papillomavirus.

1.3.2 Specific objectives

1. To determine the level of knowledge on HPV vaccine among guardians residing in Mandera East Sub-County, Mandera County, Kenya.

2. To determine the level of acceptability of HPV vaccine among guardians residing in Mandera East Sub-County, Mandera County, Kenya.

3. To determine socio-cultural factors influencing HPV vaccine acceptability among guardians residing in Mandera East Sub–County, Mandera County, Kenya.

4. To determine the health facility-related factors that influence HPV vaccine acceptability among guardians residing in Mandera East Sub-County, Mandera County, Kenya.

1.4 Research Questions

1 What is the level of HPV vaccine knowledge among guardians residing in Mandera East Sub-County, Mandera County, Kenya?

2 What is the level of acceptability of HPV vaccines among guardians residing in Mandera East Sub-County, Mandera County Kenya?

3 What are socio-cultural factors influencing HPV vaccine acceptability among guardians residing in Mandera East Sub–County, Mandera County Kenya?

4 What health facility-related factors influence HPV vaccine acceptability among guardians residing in Mandera East Sub-County, Mandera County, Kenya?

1.5 Significance of the study

This thesis sought to ascertain whether parents/guardians in Mandera's hard-to-reach communities would consent to having their teenage daughters immunized against the Human Papilloma Virus with the aim to avert cancer of the cervix. The study will help spur changes in policy making, County Government of Mandera, Households/ community, Health education and promotion practitioners and Body of knowledge.

1.5.1 In regard to policymakers

The findings of the research will assist policy makers in creating educational public health strategies to reach a variety of audiences and raise consciousness regarding issues relating to HPV infection, HPV vaccination, and cancer of the cervix.

1.5.2 In regard to Household & Community

The study's findings will help in creating awareness and sensitization of the larger community on matters regarding health and most importantly HPV infection also the findings will help boost the involvement of community members through the use of local leaders and religious leaders to wider the audience range and ensure proper coverage.

15.3Regarding Health education and promotional practitioners

The results of the investigation gave information about the community members' degree of health literacy and their current position in terms of seeking out medical care.

1.5.4In regard to body of Knowledge

The study's findings will provide knowledge in regard to future research to ensure health interventions being culturally tailored to suit specific population so as to encourage and promote vaccination i.e. HPV and the results of the investigation will also aid in the provision of knowledge regarding how to guarantee successful outcomes.

1.6 Scope of the study

The investigation was done in Mandera East, Mandera County, to determine the factors that affected guardians' acceptance of the HPV vaccine. Key informants, interviewee-administered questionnaires, and focus group discussions were used to gather the data, and qualitative, quantitative, and thematic analysis methods were used to analyze it.

1.7 Limitation of the study

Due to the low rate of education enrollment among guardians, it was difficult to understand some facts about HPV vaccine included in the study. This was resolved by use of research assistants to inform the investigation's target guardians of the facts.

CHAPTER TWO:

LITERATURE REVIEW

2.1 Preamble

This segment entailed factors that hinder the uptake of HPV injection among guardians of juvenile girls in Communities that have been rendered hard to reach in Mandera County, Kenya. A description of cancer of the cervix, comprehension of the HPV vaccine, the degree of acceptability of the HPV vaccine, socio-cultural factors, and aspects of health-based facilities that affect the uptake of the HPV vaccination were all covered in this section.

Cancer has been noted as a major killer disease in the world and it's a serious concern liked to reduced life expectancy among the affected persons. In a report released by WHO, among 112 in 183 countries globally, cancer is the major cause of mortalities among citizens aged below 70 years, this is consistent in another 23 nations where cancer is the third and fourth noted killer disease. With increased intervention to reduce mortality cases related to coronary heart disease and stroke, cancer is emerging as the most killer disease in the globe. (GLOBOCAN, 2020).

The HPV virus remains to be most abundant virus transmitted through unprotected sex worldwide (WHO, 2020). From studies done, it has been noted that sexually active teenagers will get diseased by this disease once in their period. Scientists have separated HPV into two categories: highly transmissible HPV and minimal-risk HPV. (Kombe Kombe AJ, Li B, Zahid A, Mengist HM, Bounda GA, Zhou Yet al., 2021). For instance Low risk HPV has been linked with the presence of cutaneous warts and anogenital among the infected

individuals whereas high-risk HPV has been linked with oropharyngeal medical conditions with a high-risk of anogenital cancer such cervical, penile, anal and vulvar cancer. (Kombe Kombe AJ, Li B, Zahid A, Mengist HM, Bounda GA, Zhou Y, Jin). Cancer of the cervical cavity is the second most common cancer in women of reproductive age and is also the second most lethal disease, after cancer of the breasts. (Kombe Kombe AJ, Li B, Zahid A, Mengist HM, Bounda GA, Zhou Y, et al. 2021). Globally the epidemiological dispersal of HPV and its linked problem varies across regions. Studies done have identified social-economic, genetical factors, and social-cultural factors as the major cause of mortality and morbidity linked with this killer disease. Other factors such as the age of the respondent, sex, anatomic position, and status of health have been noted as risk factors for HPV (Kombe Kombe AJ, Li B, Zahid A, Mengist HM, Bounda GA, Zhou Yet al., 2021).

Cancer of the cervical cavity, which has a predicted mean age rate of 42.7 and 30.6 as opposed to 2-5 in Western Europe and Australia, was the most common type of malignancy in Central and Eastern Africa. Eastern African nations have been ranked as the most affected nations by this burden with a greater death rate of 27 / 10000 compared to 2/10000 in the developed nations. (Western Europe and Australia. (Hillary Mabeya, Sonia Menon, Steven Weyers et al., 2018). GLOBOCAN statistics for 2020 show that there were roughly 604,127 new cases of cancer of the cervix reported, with a mortality rate of 341,831 and varying incidence rates by region. With forty instances per 100,000 women and 36,497 fatalities, Eastern Africa had the highest rate of incidence, followed by Southern Africa (thirty-six cases per 100,000 women and 6,867), middle Africa (31 instances per 100,000 women and 10,572), Western Africa (twenty-three instances per a hundred thousand women and 18,776), and Northern Africa (six cases per 100,000 women and 4,033) (GLOBOCAN

2020). Although the occurrence rate of cancer of the cervix varies greatly worldwide, low- and middle-income countries account for 80% of cases, with Sub-Saharan Africa encompassing over 90% of this global problem. Women in SSA are highly affected by the consequences of having cervical cancer, this often leads to higher numbers of comorbidities and mortality rates which have an adverse economic effect. Cancer of the cervical area affects 43.1 women out of every 100,000 in Southern Africa, making it a serious public health issue with an uncertain future. According to a 2018 study, cancer of the cervix, which accounted for 21.7% of all cancer-related deaths in women of reproductive maturity in SSA, was the leading cause fatalities among them (Jedy, 2020). Kenya has not been spared either as mortality cases related to cervical cancer are on the rise among reproductive active women and the second most prevalent type of malignancy among females of reproductive age. The cervical cancer incidence rate is estimated to be 2,500 cases per year, with more than 1500 mortality cases being recorded every year with an estimated life expectancy of 25 years. The incidence rate of cancer of the cervix is expected to double by the year 2025 if no interventions are not put in place (Hillary Mabeya, Sonia Menon, Steven Weyers et al., 2018).

Immunization of girls before HPV exposure is crucial in developing countries, for example in Kenya, where women often lack access to cancer screening and treatment facilities. (MOHK, 2021) HPV vaccines are safe and effective, and they can avert up to 90% of cervical cancer occurrences (MOHK, 2021). Collaboration is required to effectively deploy and introduce new vaccinations into routine immunization programs to promote awareness and build demand. “Vaccination can prevent nearly all incidences of cervical cancer, potentially sparing the lives of roughly 3,000 Kenyan women each year”. (MOHK, 2021).

According to WHO and In order to completely eliminate and decrease this worldwide health burden by 2030, UNICEF predicts of HPV administration from 2010 to 2019 are linked to the ninety percent target of HPV vaccinations. 107 (55%) of the 194 WHO the Member States, as of June 2020, had implemented HPV vaccination. By far, the WHO areas with the most introductions are the Europeans and the Americans. 85 percent of Americas and 77 percent of Europe nations have done so. In 2019, there were a record number of introductions, the majority of which were LMICs with limited admittance. The first dose of HPV had a performance coverage of roughly 67 percent, while the final dose had a coverage of about 53 percent. LMICs outperformed developed nations on average for the first dosage administration, but for the last dosage, they underperformed due to increased drop-out rates. (Bruni L, Saura-Lázaro A, Montoliu et al., 2020).

The presence of inadequate worldwide cancer intervention measures is likely to exacerbate cancer cases to 460,000 by 2040. In a report by WHO resource-constrained nations like Sub-Saharan Africa do experience a lot of challenges to hold the disease at bay. (WHO, 2020). The substantial prevalence of the disease in countries with low or middle incomes (LMICs) has been connected to social problems, a lack of adequate political support, and the existence of insufficient healthcare systems that cannot identify and treat cancer at its earliest stages(Asempah E, 2021)

2.2 Knowledge of HPV vaccine

Adequate knowledge on vaccination against HPV, cancer of the cervix, and the presence of national immunization programs against HPV influences how the HPV vaccine is accepted (Lopez, N.,Garces-sanchez, M.,Panzio M.B. et al.2020). In resource-constrained nations,

however, communal discernment of the HPV inoculation is not understood. (Dereje, N., Ashenafi, A., Abera, A et al., 2021). With the anticipated morbidity of newly diagnosed cases ranging from 570,000 to 311,000 mortality cases of women (middle-aged women) in 2018, cancer of the cervix is the fourth executioner ailment globally. Cancer of the cervix mortality is distributed differently in different parts of the world, with developing regions accounting for 85 percent of all deaths. Globally, 90% of cervical cancer cases are within the Sub Sahara Africa. The efficiency of the Papanicolaou (Pap) examination in aiding the diagnosis of the Human Papilloma Virus (HPV) has been linked with the considerable variations in epidemiologic designs of cancer of the cervix in current eras. (Zhang, X., Zeng, Q., Cai, W et al., 2021).

Cancer of the cervix is projected to affect 45.7 out of every 100,000 people worldwide each year, closely followed by breast cancer (33.5 per 100,000) and oesophageal cancer (9.8 per 100,000) among cancers which strike women in East Africa. (Globocan fact sheet for Kenya, published in 2018 by the World Health Organization and the International Agency for Cancer Research; 2019.) Cervical cancer is a major health concern for Kenyan women due to its high frequency and poor prognosis. Between 1998 and 2011, incidence rates increased tenfold, with 414 out of 100,000 women diagnosed in 2011 compared to 48 out of 100,000 in 1998. According to statistics, cervical cancer is responsible for 5,250 (12.9%) newly diagnosed cases linked to cervical cancer with 3286 (11.84%) mortality cases. It's projected that, the frequency rate of cancer of the cervix with increase by 50 % in the year 2034 among women aged 15 to 24 if no prevention measures are put in place. It's estimated that 9 women succumb to cancer of the services in their twenties every day in Kenya. (Irene Ngune, Fetch Kalembo, Barbara Loessl et al., 2021).

Although immunization against high-risk HPV strains has resulted in the ailment being prevented prophylactically, cervical cancer remains a life-threatening disease worldwide. In as much as many developed nations have researched and merged HPV immunization alongside other traditional interventions such as screening into their healthcare programs (e.g., national immunization) this does not reflect in resource-constrained nations like SSAs, where both morbidity and death rates are skyrocketing. This is brought on by a lack of access to vaccinations in countries with limited resources, where primary medical access is typically restricted or nonexistent, impeding the screening of cancer of the cervix as a secondary prevention strategy, which is common in High Income Countries (HICs)(Asempah E, 2021).

Cancer of the cervical cavity is a serious problem in SSA, where economic, cultural, and social aspects are at play. The HPV vaccine is costly to acquire and has a number of stringent preservation demands, making it difficult to stock and distribute in the developing country. Local social hurdles to higher vaccine uptake include beliefs that the inoculation will inspire inappropriate change in social behavior among children and teens who get immunized with the HPV vaccine, as well as various forms of disinformation. Another important impediment is the general' 'public's lack of understanding regarding inoculation of HPV and prevention strategies for cervical cancer of the cervix in upcoming nations. All these factors work against measures put to avert cervical cancer inefficaciously in upcoming nations. Low-resource communities need a new perspective on how to improve knowledge about the threat of cancer of the cervical cavity and the best ways to handle the threat through scientifically validated preventative strategies due to the complexity of the obstacles to preventing and controlling the spread of the disease (Magdiel, 2021.)

2.3 Acceptability of HPV vaccination

Numerous factors impact the acceptance of the HPV shot and how it's accepted by society (Wong, 2014). The cost linked to this vaccine has been racked a major blockage for the uptake of this vaccine. Other factors such as side effects linked to these vaccines play a vital role in its uptake (Waller, 2016).

Studies done in the western nations and resource-constrained nations indicated high-interest rates in these vaccines despite the high cost, safety issues, and cultural factors linked with them. Because these vaccines are relatively new to the market and primarily target women who are sexually active, there is cause for concern. In spite of the fact that cancer of the cervical cavity education and knowledge are frequently lacking, additional investigations conducted in Sub-Saharan Africa (SSA) have reported comparable results. Research in Ghana found a high level of readiness for vaccination, although many respondents raised concerns about the side effects such as 'altering girls' fertility and vaccination management that was dangerous. Becker-Dreps, 2010, observed great acceptance (95%) in Kisumu, West Kenya, however, this number reduced when it was mentioned that vaccination needs three doses (31%). Furthermore, it has been proposed that acceptability varies by ethnicity. (Vermandere, 2014).

2.4 Influence of social-cultural factors on the uptake of the HPV vaccine

To promote vaccine uptake, it is critical to educate people about the advantages of vaccination against HPV and to understand the association between HPV Infection and HPV-linked concerns. The cultural backdrop and existing societal morality in a given republic or communal must also be put into consideration to alleviate any concern. For

instance, in culturally marginal communities, social perceptions of sexual activity beliefs and values may contribute to aversion to receiving the HPV vaccine. The process of informed consent is made more complex by language barriers. These obstacles are not impossible, and initiatives to educate adolescents, parents, and health care providers can help enhance vaccination knowledge and willingness. (Zheng, 2021).

The auspicious perspective of HPV vaccine brings about negative moral overtones in different regions globally, including Western countries and Asia. (Wong LP, Wong PF, Megat Hashim MMAA, Han L, Lin Y, Hu Z, Zhao Q, Zimet GD et al., 2020). Due to the fact that Asian countries are more sexually avant-garde than nations in the West, acquiring the HPV vaccine in Asia has caused humiliation since the introduction of the first HPV vaccine. Concerns related to sexual activities are off-limits in Asian culture and are considered indecent. Sensitivities about sex-related topics, for example in Malaysia a Muslim-dominated nation have led to barriers in accessing reproductive health support and information Parents are unable to discuss sex with their children due to deeply ingrained cultural taboos, and normal talk on sexual wellbeing at home and the society is limited. (Wong LP, Wong PF, Megat Hashim MMAA, Han L, Lin Y, Hu Z, Zhao Q, Zimet GD et al., 2020).

Muslims opposing vaccinations because they have been connected to non-halal (i.e., prohibited in Islam) remains a major source of worry throughout the world, especially in Asia, which has the world's largest Muslim population, with Indonesia having 231 million Muslims out of the world's 2.01 billion, according to the World Population Review, 2023, One of the biggest sources of worry is the possibility that vaccines contain unclean materials

especially porcine or porcine-derived components. Muslim parents expressed concerns about whether the HPV immunization met the strict permitted standards outlined in Islam once it was approved for use, as they had done with all other immunizations (Ahmed A, Lee KS, Bukhsh A, Al-Worafi YM, Sarker MM, Ming LC, Khan TM et al., 2018).

The HPV injection has been proven to offer protection against HPV infections, unlike other vaccines, it increased vaccination resistance even more. Given the long-standing discussion regarding the halal ambiguity of vaccinations in general, it is becoming more evident that young Muslim women are redundant on HPV immunization due to religious uncertainty. (Sopian MM, Shaaban J, Yusoff SS, Mohamad WM, 2019; Larson HJ.2013; Wong LP, 2009). Lack of assurance regarding whether the ingredients used in the production of the HPV vaccine and the method of production are done in accordance with Islamic standards, as well as whether it is socially acceptable to seek protection against a Sexually Transferred Infection (STI), where an infection can be passed by having more than one sexual partner, have an impact on the acceptance of the HPV vaccine (Li P.Wong, Pooi. F. Wong, Megat M. Amirul, Amzar M. Hashim et al., 2020).

In Kenya there has also been hesitance in regard to uptake of HPV vaccine, in particular, the acceptance of guardians/ parents to immunize their daughters against HPV in spite of the fact that the HPV vaccine services are readily available, the views/ opinions of the guardians in matters concerning the health of their adolescent girls is one of the challenges that have been experienced in some studies conducted by researchers in Kenya. (Karanja-Chege, C.M., 2022). According to other studies, it was reported that the HPV vaccine uptake was low due to interferences brought about by covid 19 pandemic (Tsu , 2021), other challenges

that affect the HPV uptake include lack of consistent physicians recommendations in matters regarding to providing the required motivation to take up the HPV vaccine.(.Gilkey et al.,2015, Gilkey et al.,2016). According to a research investigation carried out in Nakuru on the adoption levels of the first and second doses of the HPV vaccine, the uptake levels were low at the beginning of the program, at 11% for the first dose and 9% for the second dose, due to factors like ignorance of the new vaccine, misinformation and misunderstandings, and religious misadvise. This led to vaccine hesitancy, which could be related to concerns about safety(Chepkemoi, T. and Jerotich, P.,2023), This is in line with an investigation by McNutt., 2016, which found that social norm, physician bias, as well as vaccine hesitancy were all contributing factors to the low HPV vaccine uptake at the beginning of the program.

2.4.1 Influence of sexual behavior

Muslim parents and guardians in Hong Kong, South Korea, and other developing Muslim countries were reluctant to permit their teenage daughters to receive the HPV vaccine because they believed that it would encourage early sexual onset and promiscuity due to the fact that cancer of the cervical cavity is sexually transmissible. (Shaikh MY, Hussaini MF, Narmeen M, Effendi R, Paryani NS, Ahmed A, Khan M, Obai d H et al.,2019). Offering Sexually Transmitted Infection (STI) prevention may be seen by the targeted young females as permission to engage in sexual activity, or it may result in risk compensation. Young women in Denmark, for example, have expressed concern that the vaccine may generate a false sense of security among vaccinated persons, leading to increased high-risk sexual conduct. However, these worries are expressed by a small group of people, frequently from orthodox religious backgrounds. Acceptance, coverage, and herd

immunity are jeopardized as a result. Several studies show no increase in sexual activity among the people who have been vaccinated. (Li P.Wong, Pooi. F. Wong, Megat M. Amirul, Amzar M. Hashim et al., 2020).

2.5 Health-based facility factors

Health care providers and parents/guardians must be educated and informed about cancer of the cervix, HPV, and HPV vaccinations to enhance vaccine uptake and, as a result, improve cervical cancer primary prevention. An HPV vaccination program should take into account the unique challenges that HPV vaccination execution faces, such as the suggested schedule of two doses for females between the ages of nine and fourteen and three doses for females 15 years and older, as well as if their immunity is weakened **(**Mabeya, 2018).

Low uptake of HPV vaccination has been linked to an inadequacy of education materials on HPV inoculation in medical and educational institutions and other public entities. (Asseffa NA, 2017). This educational material is generally used to communicate information about health to a broad population. A study identified failure by health professionals to provide HPV vaccination education materials to teenagers as a hindrance to the uptake of the vaccine and hence documented the need for educational programs and awareness on HPV vaccination. Studies have shown that health personnel must be competent to deliver sufficient information regarding this inoculation. Health care providers are viewed as the most trusted reference foundation and significantly impact vaccination decisions. (Nabirye, J., Okwi, L.A., Nuwematsiko, R et al., 2020).

2.5.1 Influence by health professionals

Personal cognitive characteristics associated with vaccination include knowledge concerning the vaccine-linked information and positive awareness of the vaccine. Teaching programs are some of the instructional and delivery strategies used to improve HPV understanding among teenagers and guardians. The HPV vaccine and other safeguards against cancer of the cervix measures must be adopted and used by parents and health professionals. For example, High-quality physician recommendations have proven to boost HPV vaccination sequence instigation by three times and accomplishment by three and nine times. It emphasizes the importance of complete training for Health Care Professionals (HCPs) in the provision of essential information (Shuk, 2019).

Other American investigations revealed that the public's acceptance of the HPV vaccine was significantly influenced by the medical recommendations of doctors (Oh et al., 2021), this is not the case for the resource deprived regions due to the costly nature of accessing medical care and the unavailability of medical practioners, not forgetting unavailability of reliable HPV vaccine services. (Gilkey et al., 2015, Gilkey et al., 2016).

However, inadequate training programs among health workers in SSA are recognized as a significant health system limitation in other studies. According to several studies, health care providers (such as doctors, nurses, and midwives) have limited awareness about HPV infection. Additionally, little is known about the occurrence and prevention of cancer of the cervical cavity, the availability of an effective HPV vaccination, and the suggested schedule for HPV vaccine acceptance (Audu, 2018).

2.5.2 Consistent supply of HPV Vaccine

Low HPV vaccine intake can also be due to lack of information. Currently, there is an upsurge in HPV vaccine inadequacy globally due to rising global demand (more than double the order in 2018 compared to 2017) resulting from more publically financed forums an action intended to enhance gender-neutral immunization and multi-age group-driven efforts. The launch of the HPV vaccine in several LMICs has been postponed. For example, the Ethiopian administration premeditated a nationwide multi-age cohort (9-14-year-olds) vaccine launch in 2018. However, due to a global vaccine shortage, it was only possible to vaccinate 14-year-old girls. Recently there has been an increase in vaccine producers who are expanding their manufacturing capacity, together with the construction of new amenities to meet worldwide demands, significant lead times (up to four years) are still required, as are regulatory approvals. It is unlikely that production will increase and be able to meet expected demand by the year 2024 (Zheng, 2021).

New vaccinations challenge the existing health systems of most developing countries and may cause inconsistency in supply, according to Nabirye, J., Okwi, L.A., and Nuwematsiko, R et al., 2020. As a result, their vaccination supply and logistical systems are experiencing difficulties. Furthermore, storage capacity impediments can be experienced at the national and regional levels, making vaccine access, availability, and quality risk. To protect the vulnerable group against HPV and its associated health problems, there is a need to ensure a swift supply of HPV vaccines aimed at protecting the vulnerable group. Administration of a sole amount of HPV inoculation or delay in the 2nd administration of this shot could solve the problem linked to inadequate vaccines. WHO recommends temporarily suspending

gender-neutral and multi-birth cohort inoculation efforts, however, this is a challenge in nations with a well-established inoculation package. The International Papillomavirus Society (IPVS), the world's leading organization dedicated to papillomavirus research has endorsed these recommendations. (Zheng, 2021).

Various gaps have been identified in the literature review they include;

Acceptability of HPV vaccination was concluded to be low in as much of the vaccine was available. Availability of adequate knowledge on HPV and cervical cancer is key factor in influencing whether HPV vaccine is accepted or not, low income countries were most affected with lack of adequate knowledge with majority having misconceptions such as the vaccine inoculating inappropriate social behavior among teens. In terms of social cultural factors it was concluded that marginalized communities with poor perceptions of sexual activity beliefs & values may contribute to aversions to receiving the HPV vaccine and also fear of the vaccine promoting indecent and inappropriate behavior. There was also lack of educational materials on HPV vaccination that hindered the uptake of HPV vaccine.

In conclusion it was reported that acceptance of HPV vaccine was faced with a lot of resistance due to lack of adequate knowledge especially in LMIC countries who lacked basic health care services. Another factor that was reported was the low acceptability rate of HPV vaccine even with the vaccine being free this was due to the issues relating to safety of the vaccine, cultural factors, side effects and religious misconceptions relating to the manufacture of the HPV vaccine and the vaccine not conforming to the Islamic laws not forgetting the lack of education materials on HPV vaccination for the teens affected the understanding of the HPV vaccine and its uptake.

2.6 Theoretical framework

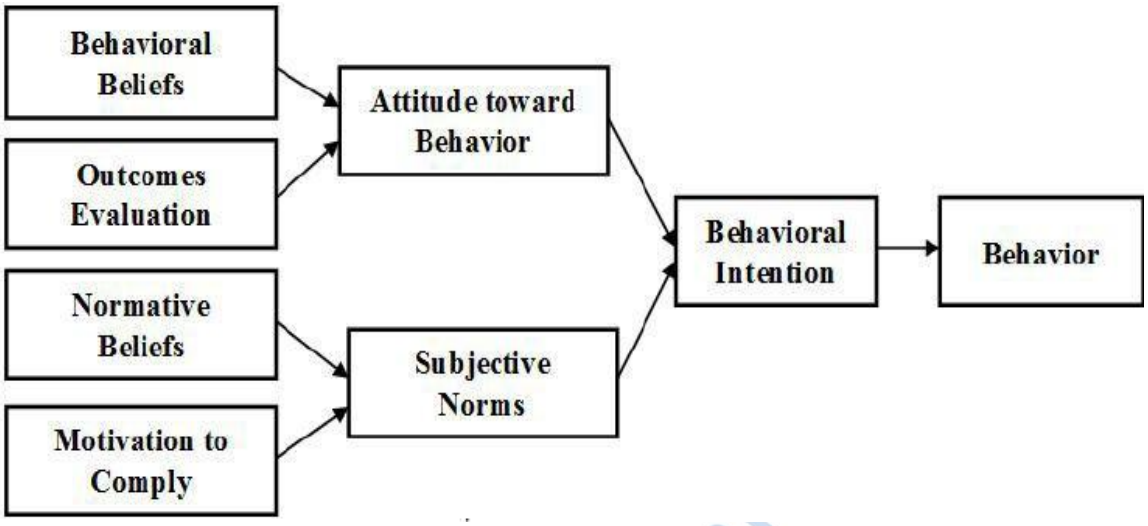

Figure 2 1: Theory of Reasoned Action (TRA)

Martin and colleagues came up with the (TRA) in 1975 as an upgrade over the information Integration theory. Fishbein and Ajzen framed the theory after defining the transformations between attitudes and behavior. The approach acknowledged that some factors can limit the influence of perspectives on behavior.

TRA sought to elaborate the association between awareness and performance within individual activities. Based on their pre-existing attitudes and behavioral intention, it predicted how individuals behave. The Theory of Reasoned Action asserted that varying perspectives determine the choice of being vaccinated. These factors include; attitude toward HPV vaccination, understanding of HPV being the contributing agent, wellbeing and effectiveness of vaccination, alleged momentousness of HPV infection, vaccine cost, and sanction by medical experts.

2.7 Conceptual framework

The conceptual framework investigated and clarified how the independent and dependent variables influenced each other. Internal factors make up the independent variables. The acceptance of the HPV serum was impacted by health-related facility issues as well as cultural and social factors relating to customs, beliefs, and perceptions of people, religion, and knowledge of the uptake of the HPV vaccine.

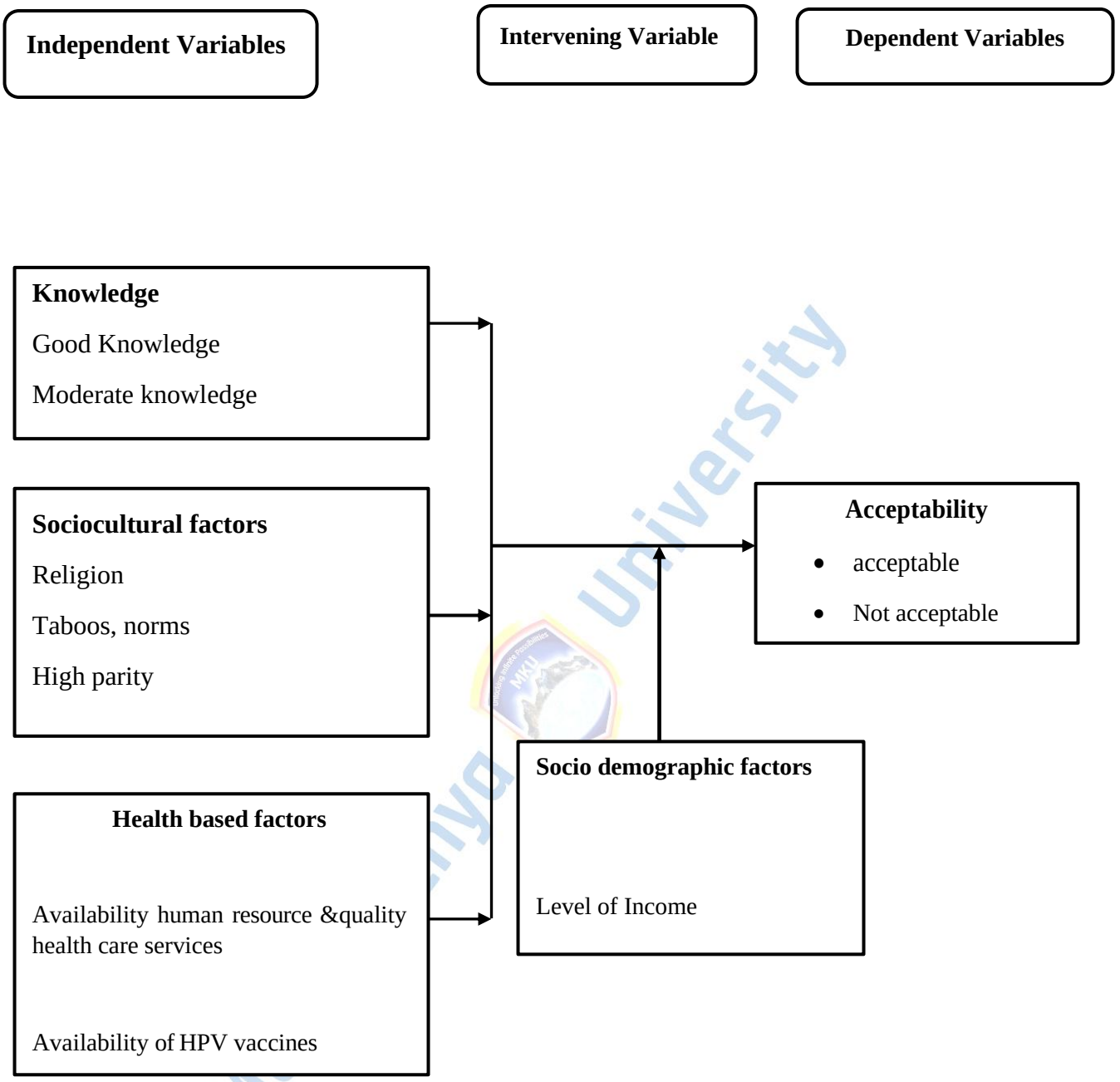

Figure 2. 2: Conceptual framework adopted from a literature search

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Preamble

The chapter talked about the methods used by the researcher to conduct the study. The chapter covered the research design, study setting, target audience, sampling strategy, sample size determination, data collection, data analysis and ethical concerns.

3.1 Research Strategy

An analytical cross-sectional study design was used in this investigation to compare a number of different factors at once, including age, education level, and adoption of the HPV vaccine. A cross-sectional study design created an image of the HPV vaccine acceptability level at a given time.

3.2 Study Location

The investigation was carried out in the Mandera East Sub-County of Mandera County. Mandera County is located in Kenya's north-eastern region. To the south-west, it borders Wajir County; to the north, Ethiopia; and to the east, the Somali Republic. Between latitudes 3.41667°N and 40.6667°E, the county can be found. Mandera East, Mandera South, Mandera West, Mandera North, Banisa, and Lafey are the six sub-counties that make up the entirety of the county. The County has an area of 25,991.8 km2 and 867,457 people. (Kenya National Bureau of statistics, 2020), with an annual growth rate of 3.96 percent, it has a population density of 33 persons per km. (KNBS, 2020). Nomadic pastoralism is the primary economic activity of the County as a result of prolonged droughts and a lack of water

(KNBS, 2020). Mandera has a semi-arid climate, and the majority of its regions lack permanent water sources or water masses, reporting year-round low rainfall. Mandera County's physical and geographical location makes it a hard-to-reach County due to its poor infrastructure. Most of its roads are murram and bumpy, with insecurity issues surrounding the County and the neighboring countries like Somalia. The social and economic situation of the community depicts the challenges in accessing the community. Mandera's healthcare structure conforms to the national system with 6 level 4 facilities in the County, nine level 3 facilities and 24 level 2 facilities, with 6 nursing homes and 60 private clinics, with most of the common diseases reported as malaria, malnutrition, skin diseases, diarrhea, cholera, dysentery, urinary tract infections (UTIs) including conflict related conditions prevalent in cross-border communities, psychological illnesses and communicable diseases. The communities in Mandera county have better access to health services than neighboring countries, but still lag behind than most counties in terms of health indicators with the highest mortality rate of 3,795 per 100, 000 live births compared to the national average of 488 (Interpeace Kenya programme, 2021) The study was conducted in Mandera East Sub-County, which has a population of 159,638, 432,444 females overall, and 434,976 males overall (KNBS, 2020).

3.3 Target population

This study targeted guardians / Parents of adolescent girls in 5 community units within Mandera East Sub County. There was an estimated 3,000 guardians within the five community units. The five community units that represented the sampling frame included;

the Khadija dispensary, Shafshafey dispensary, Border point dispensary, Neboi dispensary, and Khalalio dispensary.

3.4 Sampling procedure and techniques

The sampling frame included both a list of community units and a list of households obtained from the community health volunteers. Mandera East has five community health units, including Khadija, Shafshafey dispensary, Border point, Neboi, and Khalalio dispensary. Each area was managed by a community health volunteer. A simple method involving random sampling was used to choose the Community Units (CUs). Each community health volunteer had a list of households with teenage girls and knew the names of about 20 of them. Community Units (CUs) served as the sampling unit. Utilizing a simple method of random selection, households that satisfied the eligibility requirements were chosen.

Table 1: Sampling Frame

Serial No.	Community Health Unit	No. of CHVS	No. of households	Estimated no. Guardians
1	Khadija	2	40	520
2	Shafshafey	2	40	322
3	Border point	1	20	233
4	Khalalio	3	60	700
5	Neboi	2	40	600
	Total	100		2375

3.5 Criteria for Eligibility

3.5.1 Criteria for Inclusion:

1. A parent/Guardian of a girl aged 9-14

2. A resident of the County for at least six months by the time of the survey

3. Consent to participate

3.5.2 Exclusion criteria

1. A parent /Guardian of a girl child aged 9-14 years but who do not meet the residence criteria

2. Having been a resident in the sub-county for less than 6 months

3. Parent/guardian without girls in the target age category

3.6 Sample size determination

The investigation was carried out with a +5% Margin of Error (MOE) and a 95% confidence level. The total amount of samples (n) required by the cautious proportional for a MOE of +5% (p).

P = 0.5 (or 50%) is: n = $\left(\frac{Z}{MOE}\right)2$ P (q)

Where;

n represents the wanted trial size

Z^2 the required confidence interval, represents the normal deviation from the mean.

p represents the projected percentage of female guardians in the target populace

q = 1 - *p*

The number of respondents used in the research sample was:

$$n = \frac{1.96^2(0.5x0.5)}{(0.05)^2} = 384$$

The sample was therefore, 384

Because there are fewer than 10,000 people, finite populace alteration (FPC) was taken into contemplation.

Accordingly, The adjusted size of the sample was taken into account as follows:;

$$n = \frac{(n0)}{(1+(n0-1)/N)}$$

Where n is the size of the sample

n^0 represents the attuned sample size

N represents the total populace of females in the Mandera East sub county

$$n = \frac{(384)}{(1+\frac{(384-1)}{2375})}$$

n= (384/113)

n= 268

The new sample size was determined by allowing for a 10% non-response.[n]

Adjusted) with = 90% is unadjusted

n' = 278 respondents.

3.7 Research instrument

The interviewer employed an organized questionnaire with five sections, beginning with inquiries about the guardian's socio-demographic characteristics. The second item included questions about cervical cancer, cancer of the cervix screening, and the HPV serum, as well as the causes of cancer of the cervix and infections related to HPV. The third item included concerns about HPV vaccination beliefs and acceptance. The fourth item, on the other hand, looked into socio-cultural factors that influence HPV vaccine uptake. Lastly, the fifth item focused on health-based facility factors that affected the utilization of vaccines related to HPV. The questionnaire adapted item scales from several authors, including (Witte, 1998). The study's goals were emphasized in the questionnaire's items. While interviews with key informants (KII) and focus group discussions (FGD) produced qualitative data, questionnaires given to interviewees generated quantitative data.

3.7.1 Pilot study

Mandera North Sub-County and Lafey Sub-County in Mandera County served as the study's pilot locations. In line with Connelly's (2008) recommendation that 10% of the trial forecast for the more comprehensive parent investigation was adequate, the study included 27 respondents for the initial investigation.

3.8 Validity and Reliability of study instruments

Cox (2018) explains consistency as the ability of the items or pointer variables under examination to consistently measure the same thing or value under identical circumstances without bias or inaccuracy. When used more than once but in the same circumstance, the items under inquiry are anticipated to produce findings that are comparable. Additionally, it is assumed that all objects are legitimate. Gandek (2108) asserts that an item's validity is how it measures what it should. For example, a research tool is said to be invalid when it measures a concept other than what it was intended to measure. Before collecting data, the research instruments must be evaluated for validity and reliability because subpar research tools would lead to subpar gathering of data.

The accuracy of decisions based on test results was ensured by a reliability analysis. According to Bolarinwa (2015), Cronbach's alpha is the most typical and frequently employed dependability analysis reliability measure. Additionally, Cronbach's alpha was the most accurate way to assess the precision of the reliability assessments of the study instruments because both of the research instruments used in the present investigation were on the Likert scale (Gliem & Gliem, 2003). According to George and Mallery (2003), a Cronbach's alpha value of greater than 0.6 is regarded as acceptable.

3.9 Methods& Procedures for Data Collection

3.9.1 Focus group discussion

Discussions in focused groups centered on the variables that affected the acceptability of the HPV vaccine. After the consent process, two focus group discussions were held, with two groups of six female and male guardians who consented to participate. The groups were

picked deliberately based on observed expressions of opinion during the consent process. Half of each group comprised of guardians' who had actively participated in the earlier presentation session. In contrast, the other half consisted of those who had not partaken actively in the presentation. Focus groups held their, discussions in their local language and lasted for about one hour and thirty minutes for both groups. A priori set of themes served as the foundation for the focus group's discussion guide, which covered participants' views and impressions of the study in addition to factors that might affect their decision to take part in future research. Priori themes were introduced, but as the discussion went on, more in-depth questions were asked in response to the relevant problems that the participants raised. A research assistant regulated the focus group discussions, took notes, and then transcribed the conversations. The recorded data was verbatim interpreted into English and transcribed.

3.9.2 Key informant interviews

To confirm and clarify any pending or newly identified problems mentioned in the structured questionnaires and focus groups, key informant interviews were conducted. Key informants, according to Bernard (1994), would aid as a helpful beginning point for a deeper comprehension of contextual matters related to the subjects being investigated. The Director of public health, Chief Officer of public health, Sub- County public health officer, and Medical Superintendent were selected to be key informants of our study. The community and those who were able and were willing to reflect on the findings were used to pick leadership positions, either formal or informal, for the key informants.

3.10 Analysis of Data Techniques & Procedures

Both inferential methods were used to analyze the quantitative data, and associations between categorical and continuous variables were examined at a 0.05 level of significance using chi-square tests and regression analysis, respectively. Additionally, statistical methods that were descriptive were employed. Thematic analysis, which involves reading through a data set and looking for patterns in the meaning throughout the data, was used to examine the qualitative data (recordings were transcribed from Somali to English language). At the same time, moderation analysis was used to quantify the effects of the moderating variable. Thematic analysis was used to analyze FGD responses.

3.11 Ethical consideration

The study abided by the ethical rules that were to be followed, including informed permission, anonymity, confidentiality, and results disclosure. The Institutional Ethics Review Committee (IERC) of Mount Kenya University was consulted for approval before the study was carried out and also NACOSTI approval was obtained. Before starting the actual data collection for the research, permission from the Mandera County government was also obtained. The client was not identified by name on the data collecting form, but rather by a unique research identification code number.

The information gathered from respondents was handled strictly confidential, the respondents were guaranteed of this so as to accomplish the goals of this study. Study partakers signed an informed consent form. The research assistant used the local dialect to explain to the guardians who did not understand English the importance of the study and the need to talk about the reproductive health. The participants were made comfortable with the

topic by using local healthcare professionals who were known to the participants. The research assistants were also selected from the community; thus, they acted as a link.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Preamble

The study's results and analysis are presented in this section. Following the overview of the results and discussion of socio-demographic data, each of the chapter's four objectives is followed by results and discussion.

4.2 Response Rate

In order to prevent cancer of the cervical cavity in hard-to-reach communities in Kenya's Mandera County, the research's main objective was to determine the parents' keenness to vaccinate their teenage daughters toward the Human Papilloma Virus. The investigation's estimated sample size was 268 participants, but when a 10% non-response rate was taken into account, the sample grew to 278 respondents. In the present investigation, there was a 90% response rate. Ten uncompleted questionnaires were submitted.

4.3 Social demographic characteristics of the respondent

The aim of the investigation was to identify the socio-demographic traits of those who participated. The overall distribution of the social demographic aspects is shown in Table 4.1 below.

4.3.1 Marital status of the respondents

The majority of the 189 participants (68.0%) were married. According to the results of the Chi square test, there were not any statistically significant variations in the acceptance of

HPV vaccines among participants across marital status (X2 (5, N = 278) =5.88, p=0.432). The majority of those surveyed were married, which suggests that they are engaged in sexual activity and have a high likelihood of having children. Young adolescent girls between the ages of 9 and 14 are eligible the HPV vaccine. Therefore, whether or not their children receive HPV is a decision made by the parents or legal guardians. According to multiple investigations, the use of medical care may be significantly impacted by spousal participation in decision-making, especially if a man's partner is involved(Danforth EJ,Krunk ME, Rockers PC,Mbaruku Galae S.,2009). For instance, a research investigation conducted in Ghana revealed that an important obstacle to women using services related to reproductive health is their fear of spouse retaliation as a result of disputes about whether to use these services (Adegboyega, 2019). Another study by William et al. (2012) revealed that men's ignorance of cancer of the cervical cavity was linked to their female spouse ineffective use of cancer of the cervix detection services. In the current study, a girl's ability to receive the HPV vaccine may be significantly affected by her marital status, particularly in the patriarchal Somali community that predominates in the investigation region.

4.3.2 Study Partakers' Education Level

There were 114 the participants, or 41.0% of the total, who had low levels of education. The distribution of partakers in terms of the education levels included; those that had attended primary level of education were at 5.8 % (16), those that had zero to no education level were at 4.7% (13) while the second largest population included those that did not complete secondary education at 36.3% (101), while those that had attained secondary education were

at 6.5% (18), while the largest population included those that had attained tertiary level of education at 46.8% (130). A significant number of participants, 148 (53.2%), graduated from their secondary and tertiary education. The chi square test, which was used to determine whether guardians' acceptance of HPV varied according to educational attainment, produced a statistically significant result: X2 (5, N = 278) =5.88, P = 0.02.

As a result, there were discrepancies in the parents' or guardians' willingness to consent to their children receiving an HPV vaccination. Poorly educated people are more likely to be unaware of HPV, cervical cancer, and the significance of HPV vaccination for their children. These results are in line with those of other studies. Poor levels of education have been linked to low rates of women using services for cancer of the cervix detection. For instance, Aynalem et al. (2020) found that having a high level of education was positively correlated with a high uptake of cancer screening programs and an increase in cervical cancer uptake. Their study sought to identify factors linked to cancer of the cervix screening uptake among women in Debremarkos Ethiopia.

According to a distinctive investigation carried out by Buba et al. (2019), women who had completed secondary school were more probable to use cancer of the cervix prevention services than those who had less education. Additionally, Gold et al.'s (2019) randomized controlled trial of gain-and-loss-framed messaging in the national health information leaflet discovered that participants with lower levels of education were less likely to take part in screening, while those with tertiary or higher levels of education were roughly more probable

to have the desire to screen. Both research findings indicated that using healthcare services is strongly influenced by education.

Table 4.1:Social demographic info about the partakers

Age category	**Frequency**	**Percentage**
21-25	32	11.5
26-30	10	3.6
31-35	163	58.6
36-40	49	17.6
above 41	24	8.6
Total	**278**	**100.0**
Religion	**Frequency**	**Percentage**
Catholic	39	14.0
Protestant	40	14.4
Muslim	199	71.6
Total	**278**	**100.0**
Education	**Frequency**	**Percentage**
Have never attended school	13	4.7
Attained primary education level	16	5.8
Did not complete secondary education level	101	36.3
Attained secondary education level	18	2.9
Attained post-secondary education level	130	50.4
Total	**278**	**100.0**
Marital status	**Frequency**	**Percentage**
Married	189	68.0
Never married	48	17.3

Divorced	28	10.1
Separated	13	4.7
Total	**278**	**100.0**

Pregnancy	**Frequency**	**Percentage**
No	19	6.8
Yes	259	93.2
Total	278	100.0

No. respondents children	**Frequency**	**Percentage**
1	149	53.6
4-5	97	34.9
Above	32	11.5
Total	**278**	**100.0**

4.3.3 Religion of the Study Partakers

Muslims made up the majority of the study's participants (199, or 71.6%), followed by Protestants (40, or 14.4%), and Catholics (39, or 14%). $X2 (1, N = 278) =10.23, p=0.01$ was the significant statistical result from the chi square test used to determine whether there was a statistically significant connection between consenting to take a child for HPV vaccinations by the guardian and religion. Compared to participants from other religions, Muslims were more reluctant to permit their kids to receive the HPV vaccine.

These results are at odds with those of additional investigations that examined how religion affects people's use of healthcare services. For instance, Jennifer et al. (2012) discovered that there was a significant connection between positive religious coping and compliance to all age-appropriate screening, even after controlling for pertinent covariates. The investigation looked for to determine a probable interactions among the elements of spirituality (church attendance, religious support, spiritual wellness locus of control, and religious coping) and compliance to the cancer screening suggestions for improvement. In the investigation, the odds of having finished all cancer screenings increased by a factor of 5.3 for every point higher on the scale of positive religious coping. In broad terms, studies has shown that religion has an impact on how often people use medical services. The more faith-based a person is, the more unlikely they are to use medical care, and the more inclined they are to use medical care while they are unwell (Mochache, et al, 2020)

4.3.4 No of Children by the Study Partakers

The majority of participants, 149 (53.6%), had one to three kids, while 97 (34.9%) had four or more. Over 87% of the participants belonged to one of these two groups. The results of the Chi square test, which was used to see if there was a statistically significant variance between participants with low parity (fewer than three children) and high parity (three or more children), regarding their willingness to allow their children to get immunized with the HPV vaccine, were significant: X2 (3, N = 278) =18.846, p = 0.000. Comparatively to those who had a minimum of three children, those with three or fewer kids were more reluctant to permit kids to receive the HPV vaccine.

These results correspond with those of additional investigations that have linked parity and use of medical services. For instance, an investigation conducted to determine the factors impacting the use of ANC programs in Sub-Saharan Africa found that one of the major determinants of whether respondents sought ANC goods and services or didn't was the size of their families. 2019 (Okendo).Another study (Garg, 2019) discovered a substantial association for parity of three children or more.

4.4 Knowledge on cervical cancer and cervical screening

Finding out how knowledgeable Kenyan parents in Mandera East Sub-County, Mandera County, were about the HPV vaccine, was the research's first objective. Participants were asked if they had heard of a condition known as cancer of the cervix in order to gauge their level of knowledge. The overall distribution of the responses received is displayed in Figure

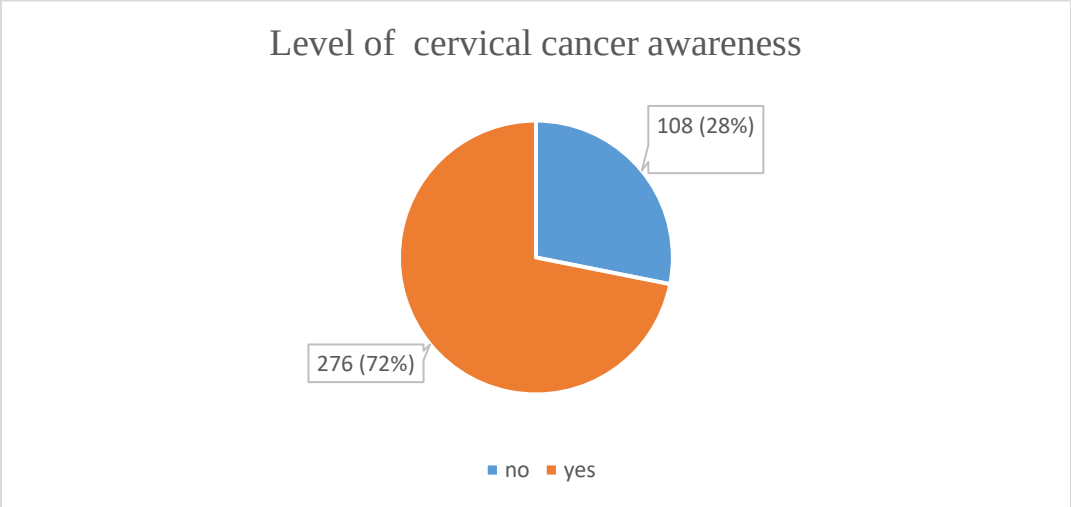

Figure 4. 1: Level of cancer awareness among the respondents

As shown in Figure 4.1, there was a high level of awareness concerning cancer of the cervical cavity among those who participated. High levels of usage of the HPV vaccine are anticipated to be correlated with high levels of awareness. High levels of awareness in this case, however, did not correspond to respondents' acceptance of the HPV vaccine. This can be attributed to a variety of factors, such as culture and the patriarchal structure of the Somali community (Okendo, et al., 2019; Mochache, 2020).

Further, the investigator sorted out the participants to ascertain their level of knowledge regarding the HPV vaccine. To do this, those who participated were given a list of seven questions with regard to the medical condition, each of which was evaluated on a binary scale. The distribution of the answers is shown in Table 4.2 below.

Table 4. 2 :Level of HPV Vaccine knowledge among guardians residing in Mandera East Sub-County, Mandera

Indicators	Yes (Good)	No (Moderate)	Do Not Know (DNK) (Poor)	MEAN	STD DEV
Have you heard of HPV?	132(47.5)	88(31.6)	36(12.9)	2.1	1.21
Do you think HPV has a role in cervical cancer development?	128(46)	11(39.9)	39(14%)	2	1.11
Does HPV infection have no symptoms?	73(26)	105(37.8 %)	100(36%)	2.1	1.417
Are HPV infections considered sexually transmitted diseases (STDs)?	72(25%)	124(44.6 %)	66(23.7%)	2.3	1.43
Can an abnormal Pap test be brought on by HPV infection?	119(42.8 %)	84(30.2%)	75(26.1%)	1.5	1.01
Are human papillomavirus and human immunodeficiency	135(48.6 %)	54(19.4%)	65(23.4%)	1.1	1.01

virus (HIV) distinct diseases?					
Did you know there is an HPV vaccine?	123(44.2 %)	41(14.7%	71(25%)	2	1.7

Numerous studies have shown a connection between cervical cancer awareness, knowledge, and service use. Our study reported that knowledge levels ranged from poor to moderate and represented by 26% as per our pie chart. According to Elisa et al. (2020), the poor usage of services for cancer of the cervix screening was directly linked to low levels of consciousness and understanding among women in the Vhembe District of South Africa. The study sought to evaluate awareness, knowledge, and usage of these services among women. Multiple research investigations have shown a connection between cancer of the cervical cavity consciousness, understanding, and service use. According to Elisa et al. (2020), the poor usage of services for cancer of the cervix screening was directly linked to low levels of consciousness and understanding among women in the Vhembe District of South Africa. The investigation sought to evaluate knowledge, consciousness, and usage of these services among women.

4.5 Acceptability of HPV Vaccine among Guardians

The study's secondary goal was to find out whether guardians in Kenya's Mandera East Sub-County were willing to receive the HPV vaccine. All of the respondents provided answers to the two questions that were posed in this regard. The concern was whether the parent or guardian would permit the girl to receive an HPV vaccination.

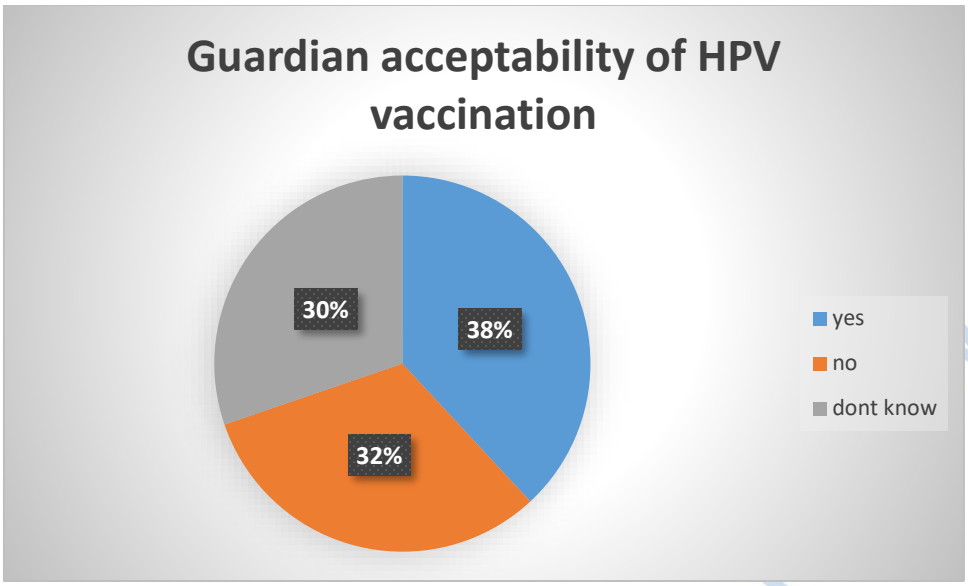

Figure 4. 2: Guardian acceptance of HPV vaccine on their childrens

Further, the guardian was asked to state whether there is a probability you could acquire cervical cancer even after receiving the HPV vaccine. In the pie chart above, it was clear that the majority of the participants (38%) were enthusiastic about the HPV vaccine being administered to their children, while the rest of the participants were either unsure of their readiness to consent to their children receiving the HPV vaccine (30%) or wholly opposed to it being given to their daughters (32%). In regard as to whether a person can still contract cervical cancer even after having received HPV yielded a positive response. The majority of the respondents believed that a person could still get cervical cancer even after they have received HPV vaccine.

As it can be seen in the pie chart above, the level of HPV acceptability among the respondents is very low. Approximately 62% of the respondents do not know about it or they do not plainly accept it on their children from qualitative data collected, various explanations

were given on this. This included people's religion. According to focus group discussions, a respondent indicated that she is not aware that the vaccine has been tried and proven to work.

'Has the vaccines been tried, I am not sure whether I know this'

Furthermore, someone who participated during a focus discussion among participants was quoted as saying that things like culture and religion were obstacles to acceptability.

"My *religion does not allow for me to subject my children to HPV vaccine".*

Further, culture was identified as another hindrance to HPV vaccines acceptability during the Focus Group discussions, a respondent said the following words;

"My culture is against subjecting my children to unnecessary vaccination, I am not willing to go against my culture".

Another hindrance to the adoption of HPV vaccine is ignorance, and expressed misconceptions about the vaccines. For example during the focus group discussions, a respondent said

"I would not wish to introduce a disease in my daughter's body, am here to protect her not harm her"

Another hindrance to adoption of HPV vaccine is associated with the patriarchal nature of Somali community. One mother during the Focus group discussion said this

"I do not have authority to allow my daughter to receive HPV vaccine. I depend on my husband to give the authority, if I defy that authority I risk losing my family"

In light of the aforementioned findings from the qualitative data, a logistic regression was carried out to determine the effects of participants' occupation, education, knowledge of cancer of the cervix, and religion on their propensity to consent to their children receiving the HPV vaccine. The results are shown in the table 4.3 below;

Table 4. 3: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	241.435[a]	.352	.483

**a. A parameter estimate change of less than.001 caused the estimation to stop at iteration number 5.

Statistical significance for the logistic regression model was 2(4) = 120.6, p .0005. The model correctly identified 86.6.0% of cases and explained 48.3% (Nagelkerke R2) of the variation in parental approval for HPV vaccination.

Table 4. 4:Binary Logistic regression model

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1a	My religion allows children to get HPV vaccination	.059	.158	.140	1	.708	1.061
	My culture allows children to get HPV vaccination	.069	.024	8.484	1	.004	1.072
	It is socially acceptable to give young girls HPV vaccination	-.522	.120	19.021	1	.000	.594
	My occupation is not a hindrance to HPV vaccination for my daughter	-.798	.126	40.157	1	.000	.450
	Constant	3.988	.550	52.582	1	.000	53.922

In the present investigation, respondents believed that one of the obstacles to HPV adoption was religion. In this study, Muslims made up the majority of respondents (71.6%), followed by Christians (28.1%). The majority of participants, 43 (43.44%), claimed that their religious beliefs hindered their ability to receive the HPV vaccine, while 38 (38.4%) claimed that religion had no bearing on their willingness to receive the vaccine. A small number of respondents, 18, (18.2%), were unsure of the impact of religion on the reception of the HPV vaccine. Chi square test on the influence of religion on acceptability was significant at X^2 (4, N = 278) =105.9, p = 0.00.

Muslims were 7.02 times less likely to be open to letting their kids receive the HPV vaccine. A higher level of education was linked to a higher likelihood of parents agreeing to let their kids receive the HPV vaccine, and knowledge of both cancer of the cervix and the HPV vaccine was linked to a higher willingness to receive the vaccine. Because Muslims have deeply held religious convictions, the majority of them rejected the HPV vaccine and were hesitant to allow their daughters to receive it. Moreover, during the focus group discussion religion was perceived to be a barrier for example, one of the Muslim respondent indicated that she is unable to allow her child to take up the HPV vaccine since she felt religion does not allow it,

"I do not think my religion allows for adoption of HPV vaccine". Muslim girls are not allowed to have sexual intercourse before marriage which therefore means the vaccine would be unnecessary"

According to a study in Asia on the influence of religion on adolescent girls reported that guardians who have strong religious convictions are likely to oppose HPV vaccination than guardians with weaker religious convictions (Wong et al, 2020). As a result of the majority of the partakers being Muslims and the fact that most of them had good knowledge of HPV, it was also discovered in the research we conducted that religion played a significant role in determining whether or not people received the HPV vaccine. Premarital relationships are strictly forbidden in Islam, which makes it unneeded to immunize teenage girls against the sexually transmissible Human papilloma virus (HPV) in order to prevent cervical carcinoma. As a result, people were less willing to receive the HPV vaccine. Islamic values and ethical

principles frequently influence Malaysia's large Muslim population, which is similar to the investigation's area where Islam is the most prevalent religion. Muslim parents had concerns about the HPV vaccine because they believed that in a culture where teens are expected to adhere to strict religious teachings and practices, the HPV vaccine would encourage reckless sexual conduct. Uncertainty about the vaccine's ingredient and manufacturing process is another problem that makes Muslims reluctant to receive the HPV vaccine.

Furthermore the use of HPV vaccines is associated with sexual activity. This may is not acceptable among the Muslim community and may be one of the reason as to why guardian may not accept to immunize their children against HPV. Studies done elsewhere showed that low adoption of HPV was associated with Islamic belief that requires strict abstinence from sex until marriage. (Wong et al, 2020).

According to our study, it was observed that majority of our respondents stated that their culture allowed their daughters to get vaccinated. (55 (55.6%), while 39 (39.4% did not know whether their culture allowed vaccination or not, and lastly 5(5.1%) responded that their culture did not allow them to vaccinate their daughters. Culture was reported to have an influence in the acceptance of HPV serum, there existed a statistical significance in relation to culture and acceptability of HPV vaccine, a Chi square test reported a statistical significance at X 2 (4, N = 278) =85.627, p = 0.00Moreover, Culture is another hindrance to HPV), during the focus group discussions, a respondent said the following words;

"My culture is against subjecting my children to unnecessary vaccination, I am not willing to go against my culture".

Another hindrance to adoption of HPV vaccine is associated with the patriarchal nature of Somali community. One mother during the Focus group discussion said this,

"I do not have authority to allow my daughter to receive HPV vaccine. I depend on my husband to give the authority if I defy that authority I risk losing my family"

According to a study on vaccination acceptance across culture, it was reported that culture collectivism was an influence in the acceptability of a health service, this is so since in a collectivism society, individuals do similar activities since they feel obliged to do by their values and norms, this comes at an advantage when a healthy behavior is adopted by an individual since, the rest of the society will accept that health behavior. (Leonhardt, et al, 2022). Similar findings were found by Nuwarda, (2022). The investigation found that, despite the fact that vaccination is the best method for the primary prevention of illnesses, there is still a lot of opposition to it for a variety of reasons, including cultural, political, social, religious, and personal experiences.

According to this investigation's findings, more than half of the participants (54%) did not think that giving young girls the HPV vaccine was socially acceptable. While 83 (30 %) agreed that it was socially acceptable to vaccinate young girls, and a few 41 (15 %) of the respondents that did not have an idea whether it is socially acceptable or not.

A significant chi square test result was obtained with X 2 (4, N = 278) =75.266, p = 0.000.

In the focus group discussions, respondents had different views regarding whether it is socially acceptable to vaccinate young girls against HPV. Some respondents said the following words;

"*I will allow my daughter to get HPV vaccination since I don't see anything wrong with it.*"

Another respondent said;

"*I will not allow my daughter to get vaccinated since I believe it is not acceptable in my community and also my culture and religion does not allow it."*

Other respondents said;

"*I do not have any knowledge concerning whether HPV vaccination it is acceptable*."

In a study on the use of health literacy as a social vaccine, it was discovered that health literacy is a significant factor in the public's acceptance of vaccination, as low health literacy predicted low social approval and reluctance in the utilization of the vaccine, while sufficient health literacy led to acceptance of the vaccine. (Okan, O., 2022). In another study on ethical and legal aspect on gender- neutral HPV the WHO stopped HPV gender- neutral vaccination due to low supply of HPV and also legal issues concerning female- only vaccination. (Logel, M., 2022).

In the present research, it was found that the majority of the participants believed that their occupation did not affect their ability to allow their daughters to receive HPV vaccination, with 69 (69.7%) participants following those who did believe that their occupation did affect their ability to do so. 30 (30.3%).Chi square test was significant at X^2 (4, N = 278) =105.9,

p = 0.000. Additionally, it came up in the focus group discussions that one of the people who participated had conflicting emotions about it. For instance, one of the respondents did not believe that their professional background had any impact on their opinion of the HPV vaccine.

He said the following words;

"*My occupation is not a hindrance to allow vaccination of my daughter but I need to know more on this HPV vaccination".*

Another respondent contradicted this by saying the following words;

"My occupation does not allow me to vaccinate my daughter since am a pastoralist and am always on the move searching for greener pastures"

These findings are comparable to those of an Italian study. The main obstacle to this safeguarding measure, according to the investigation, vaccination protection measures in Italy, and the role of professional physicians, was hesitancy. (2002) (La Vecchia, C. Additionally, occupation was one of the variables considered in determining the acceptance of the immunizations in a cross-sectional anonymous online survey that was intended at all workers at LMU University Hospital in Munich between the 25th of February and the twentieth of March in 2021 in order to gather information regarding the desire to receive the COVID-19 vaccine as well as the variables linked to the decision. 2022 (Zhelyazkova).

4.6 Socio-cultural factors influencing HPV vaccine acceptability among guardians

The third objective of the investigation was to identify socio-cultural factors that affected guardians' acceptance of the HPV vaccine in Mandera East Sub-County, Mandera County, Kenya. They were asked a number of questions in a dichotomous format. The agenda for the focus group discussions and the key interviewing of informants with stakeholders both included additional questions of a similar nature. The overall distribution of responses provided by the respondent is shown in Table 4.5 below.

Table 4. 5: Social and cultural factors influencing guardian acceptance of HPV vaccines in Mandera East sub county Mandera County

Indicators	Strongly disagree (SD)	Disagree (D)	Undecided (U)	Agree (A)	Strongly Agree (SA)	Mean	Standard Deviation (SD)
My culture allows children to get HPV vaccination	28.8%	30.4%	9.3%	13.5 %	19%	2.4	1.51
My religion allows children to get HPV vaccination	17.2%	25.2%	7.4%	12.94 %	20.7 %	2.0	1.54
It is socially acceptable to give young girls HPV vaccination	18.8%	17.7%	9.3%	26.2 %	28.%	2.2	1.517
It is agreeable to my partner to have our daughter get HPV vaccination	11.9%	25.7%	7.4%	27.2 %	27.8 %	2.3	1.43
My occupation is not a hindrance to HPV vaccination for my daughter	10%	12%	6%	28%	34%	1.9	1.01

The majority of the participants strongly disagreed, or 59.2%, when asked whether their culture permitted them to immunize their daughters against HPV, while a few respondents 32.5% indicated that culture allowed them to vaccinate adolescent girls against HPV, while 9.3% respondents had no idea of whether culture affects their ability to accept HPV vaccine or not. A significant X2 (4, N = 278) =85.62, p = 0.000, was obtained by the Chi square test to examine the association between culture and guardians' acceptance of the HPV vaccine. During the focus group discussions, a respondent said the following words;

"My culture is against subjecting my children to unnecessary vaccination, I am not willing to go against my culture".

These findings suggest that culture has a significant impact on the willingness of participants to use the HPV vaccine. The findings are supported by comparable research. For instance, in a study by Bangura et al. (2020) that aimed to identify specific challenges parents/caregivers, healthcare professionals, and health systems face that prevent immunizations for children coverage in Sub-Saharan Africa. Mainly their age, sexual orientation, beliefs, and socio-cultural aspects of the neighborhoods in which they ought to live were the factors that affected decisions to have children immunized in this study. Therefore, it is crucial that immunization programs in sub-Saharan Africa take into account these obstacles and address the individuals and societies in their local communities (Bangura, et al. (2020)

According to the findings, religion contributed to parents' acceptance of the HPV vaccine, Majority of the respondents stated that their religion did not allow vaccination of adolescent girls against HPV (42.4%), while some respondents stated that religion did not influence their acceptability of HPV vaccine (33.64%), Few participants 7.4% were undecided whether religion affected their acceptability or not. X 2 (4, N = 278) =15.297, p = 0.004 was the significant result of a Chi square test to see if there was a statistically significant relationship between religion and guardians' acceptance of the HPV vaccine.

During the focus group discussion , religion was perceived to be a barrier for example, one of the Muslim respondent indicated that he is unable to allow his child to take HPV vaccine since he felt religion does not allow it,

"I do not think my religion allows for adoption of HPV vaccine". Muslim girls are not allowed to have sexual intercourse before marriage which therefore means the vaccine would be unnecessary"

Further, there similar sentiments during the focus group discussions with the respondents. One mother corroborated the issue of pork components/ gelatin in medication.

"*I know that this vaccine has pork components and that is why I will not vaccinate my daughter. I also do not have faith in the medication from western countries, they may be poisoning us"*

In regard to whether spouse supported the idea to vaccinate the girl child, the results indicated that support by the other spouse in regard to allowing young daughters HPV vaccination was high by 55%, while there was also some respondents who stated that their partners would not allow their daughters to get vaccinated (37.6%), while a few participants were undecided about whether their partners would allow their daughters' to get vaccinated or not.

During a focus group discussion another mother said the following words; *"I do not believe my culture and religion has anything to do with my decision, the only thing we do not have is information concerning HPV vaccine"*

Another respondent who is a young mother had quite a bit of words to say in the focus group discussion,

"I f a physician tells me to vaccinate my daughter, and the physician doesn't make me understand why it's important then I will ask another fellow mother and if she explains to me the HPV vaccine and why it's importance then I will agree to vaccinate my daughter since I know that this mother would not lie to me.

Further, in regard to the cultural role of the spouse in making decisions. The study found that men had a big role in guiding on discussions in regard to allowing young girls to take up the HPV were found to be important since they are the providers in the family (De Fouw M et al., 2023).

The partakers profession also influenced how well-received the vaccine was. These results concur with those of a study conducted in Uganda. In the study men's roles of HPV vaccine among guardians in the sense that most of the respondents (62%) reported that occupation is not an obstacle in allowing their adolescent daughters get vaccinated, while some respondents (22%) stated that actually their occupation affected allowing their adolescent daughters get vaccinated. Chi square test to determine if a statistical significance existed across occupation and acceptability of HPV vaccine among guardians returned a significant result X^2 (2, N = 278) =4.815., p = 0.000.

4.7 Health facility based factors influencing HPV vaccine adoption

The fourth objective of the research was to investigate health facility based factors that affect guardians' acceptance of the HPV vaccine in Mandera East Sub-County, Mandera County, Kenya.

Table 4.6:Health facility based factors influencing HPV vaccine adoption influencing guardian acceptance of HPV vaccines in Mandera East sub county Mandera County

Indicators	Disagree (D)	Did Not Know (DNK)	Agree (A)
Affordability of HPV vaccine	33.8%	75.4 %	2.5%
Availability of knowledgeable health care workers	48.5%	24.2 %	27.3 %
Availability of health care services	13%	19.2 %	67.7 %

The study's fourth aim is to identify the factors associated with health facilities that affect guardians' acceptance of the HPV vaccine in Mandera East Sub-County, Mandera County, Kenya. This study looked into the accessibility and availability of health services (HPV). In accordance with the findings shown below, the majority of respondents—67.7%—said that there are HPV services available. By contrast, 13% said they disagree with this statement, and 19.2% said they had no idea whether there were services available or not. Chi square test result: X 2 (2, N = 278) =4.815, p = 0.0009 was found to be significant.

Both qualitative and quantitative data were gathered to accomplish this. This data was gathered through a conversation with the hospital's in-charge reproductive health officer in Mandera County who said the following words;

"*Our catchment area is wide, we receive clients from all our sub – counties and also clients from Somalia and Ethiopia. We have a good supply for most of the health commodities that are required to give the HPV vaccine, our services however are under-utilized".*

Further he was of the opinion that the HPV vaccines were available in all the health facilities;

"*I am aware the HPV services are available and accessible in the health care facilities."*

In another interview with key informant at the County, a respondent, a nurse at Mandera County Referral Hospital said the following words;

"All services are available and accessible and they are open to the public, all are welcome."

Based on these findings it is clear that services required to offer HPV vaccines have been provided for. Availability of health services has been associated with the utilization. In places where services are not available or are partially available utilization is usually low.

A study conducted in Slovenia found that, despite providing the HPV vaccine free of charge, adoption of the vaccine could have been low due to various factors, most notably safety concerns. In the Slovenia study, majority of the women refused to get the HPV vaccination,

this would have been avoided if proper information was disseminated on the benefits and safety issues in regard to HPV vaccination and also ensuring that the health care workers were up to date with the relevant information. (Jana Mlakar 2023)

Regarding the availability of human resource to provide services, majority of the respondents 27.3% indicated that healthcare workers are available and knowledgeable on matters regarding the HPV vaccine. While 48.5% respondents indicated that the human resources are not available to vaccinate young girls against HPV virus. 24.2% respondents stated that they are not aware whether the HPV services are available or not. At X 2 (2, N = 278) = 23.613, p = 0.000, the chi square test was significant.

An interview with the reproductive health in charge of the Mandera County Referral hospital showed that the staffs had been trained in matters regarding the HPV vaccine.

"We run regular trainings to equip our health care workers with the necessary knowledge and skills required to do this work". We have a good number of healthcare workers trained to offer the HPV service".

The use of medical facilities has been linked to effective training. For instance, in a study conducted in the USA to determine the accessibility and use of HPV vaccine services, it was found that medical professional suggestions were important in determining the administration of HPV vaccine. The study also found that staff turnover, inconsistencies among healthcare providers, and a lack of time on the part of the healthcare provider were barriers to the uptake of HPV vaccine (Shannon E. Mc Donald et al., 2023).

Regarding the HPV vaccine's costs, the majority of respondents (75.34%) were unaware that it was an affordable option, but a sizeable portion (33.8%) of respondents disagreed with this statement. 2.5% of people agreed that the HPV vaccine was reasonably priced. Chi square test yielded findings that were significant with X2 (2, N = 278) = 89.221 and p 0.000.

During an interview with the reproductive health in charge indicated that the HPV is free.

"*Our HPV services are free and anybody willing to vaccinate their daughter is welcome".*

According to some investigations, the HPV vaccine is offered at a reduced cost or for free in some states, but the costs associated with vaccine delivery prevent low-income countries (LMICs) from including the HPV vaccine in their national immunization programs. In addition, factors like the embarrassment associated with the HPV vaccine have had a negative impact on the utilization of the vaccine among adolescents in various parts of the world, despite the HPV vaccine's ability to protect against the disease (Escoffery, 2019, Lim & Lim 2019, Shah, 2021).

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Preamble

The study's summary, conclusion, and recommendations are presented in this chapter. A brief summary of the study's results is provided in the chapter's opening paragraph, followed by the results of the research and recommendations. The chapter concludes by outlining areas that need more study in light of the found gaps.

In order to prevent cancer of the cervical cavity in hard-to-reach communities in Mandera County, Kenya, the research's main objective was to determine the guardians' willingness to immunize their teenage daughters against the Human Papilloma Virus. The study employed a cross-sectional approach in order to assess, among other factors, the participant's acceptance of the HPV vaccination. After accounting for a 10% non-response rate, the study's calculated representative sample of 268 increased to 278 participants. The current study reported a response rate of 90%. However, a few questionnaire items were left blank or unanswered because some respondents missed them (10). A summary of the key findings based on the goals is provided in the following sections.

5.2 Findings Summary

5.2.1 Level of awareness and knowledge

The study's primary goal was to gauge the level of HPV vaccine knowledge among parents and guardians living in Mandera East Sub-County, Mandera County, Kenya. Participants

were questioned about their level of knowledge by asking them if they had ever heard of the disease known as cervical cancer. According to the respondents, there was a high level (72%) of awareness of cancer of the cervix.

The researcher further sorted among the participants to ascertain their level of knowledge regarding cancer of the cervix. To do this, participants were given a list of seven questions about the disease that were presented on a binary scale. The level of knowledge was found to be inadequate (42.5%) among the respondents and thus lead to lower uptake of HPV vaccine /non- adherence to HPV vaccination this lack of HPV knowledge negatively impacted the willingness by guardians / parents to allow vaccination of their adolescent girls.

5.2.2 Acceptability of HPV vaccine among guardians residing in Mandera East Sub-County, Mandera County, Kenya.

The second objective of the research was to find out whether parents living in Kenya's Mandera East Sub-County would accept the HPV vaccine. Each respondent provided a response to one of two questions that were posed in this regard. The guardian of the girl child's right to receive an HPV vaccination was the subject of the inquiry. Only a small percentage of the participants indicated that they would be willing to let their daughters to receive the HBV vaccine, which indicated that the level regarding acceptance was low. The results of additional analysis using binary logistic regression revealed that Muslims were 7.02 numerous times less likely to show an intention to allow their children to receive the HPV vaccine. A higher level of education was linked to a greater likelihood that parents would be open to their kids getting the HPV vaccine, and knowledge of both cervical cancer of the cervix and the HPV vaccine was linked to a greater adoption of the vaccine. This was supported by a qualitative study that revealed that schooling and

faith were important considerations for parents when deciding whether to consent to their daughter receiving the HPV vaccine.

5.2.3 Socio-cultural factors influencing HPV vaccine acceptability among guardians residing in Mandera East Sub–County, Mandera County, Kenya.

The third objective of the investigation was to identify socio-cultural factors that affected guardians' acceptance of the HPV vaccine in Kenya's Mandera East Sub-County. The respondents were questioned several times using a dichotomous format. Both the focus group discussion agenda and the key interviews with informants with stakeholders included additional, related questions.

Regarding this, the quantitative results showed that culture is a major factor in determining whether a guardian will allow their daughters to receive vaccinations. Qualitative information gathered through focus group discussions contributed to this. Particularly significant aspects of culture that were mentioned included religion and the custom that places the male spouse at the center of decision-making..

5.2.4 Health facility-related factors that influence HPV vaccine and acceptability among guardians residing in Mandera East Sub-County, Mandera County, Kenya.

The investigation's fourth objective was to identify the factors related to health facilities that affect guardians' acceptance of the HPV vaccine in Mandera East Sub-County, Mandera County, Kenya. Both qualitative and quantitative data were gathered to accomplish this. The majority of those who participated to the study said that HPV vaccine services could be obtained and that human resource power was easily accessible and adequately qualified to

provide HPV services. The Mandera County Referral Hospital's reproductive health officer, who was interviewed for this article, confirmed that services are offered and that healthcare professionals are qualified to provide them.

5.3 Conclusions

In order to prevent cancer of the cervical cavity in hard-to-reach communities in Mandera County, Kenya, this study aimed to determine the guardians' willingness to immunize their teenage daughters against the Human Papilloma Virus. The purpose of this investigation was to assess the acceptance of HPV vaccines as well as the degree of awareness and knowledge about HPV, HPV vaccines, and cervical cancer. The influence of social and cultural factors on acceptance of the HPV vaccine. The research investigation also aimed to assess the vaccine's acceptability. Additionally, the study sought to identify aspects related to health facilities that affect guardians' acceptance of the HPV vaccine in Mandera East Sub-County, Mandera County, Kenya.

1. The study found that although guardians in Mandera East Sub-County, Mandera County, Kenya, have a high level of awareness (72%), they have a low and insufficient level of knowledge about HPV, HPV vaccines, and cervical cancer (42.5%) . Due to lack of knowledge about the HPV vaccine, the association between the HPV virus and cervical cancer, vaccine hesitancy, and worries about the vaccine's safety, this resulted in a low uptake of the HPV vaccine.

2. The study found that there is a low level of acceptability (38%) for the HPV vaccine among guardians living in Mandera East Sub-County, Mandera County, Kenya. The

study found that social and cultural factors affected the acceptance of the HPV vaccine. This was because the community upholds strong values and beliefs, and going against those values and beliefs would be harmful.

3. The study concluded that socio-cultural factors, such as norms and traditions, were a strong determinant influencing uptake of HPV vaccine among the community members because the cultural values were a way of life for the community and did not condone sexual relations prior to marriage, necessitating the need to acquire the necessary knowledge and skills.

4. In regards to health facility-related factors that affect guardians' acceptance of the HPV vaccine in Mandera East Sub-County, the county of Mandera, Kenya, the study found that there are enough healthcare facilities to meet demand for healthcare services. Furthermore, healthcare professionals have the necessary training to administer HPV vaccines.

5.4 Recommendations

This study has a number of recommendations to stakeholders working in prevention and control of cervical cancer. This includes; the policy makers, County of Mandera, Household and community, Health Practitioners, and health researchers.

1. Level of HPV vaccine knowledge among guardians residing in Mandera East Sub-County, County of Mandera, Kenya.

This study has demonstrated that the level of awareness is high but level of knowledge is low among the respondents. In promoting utilization of HPV vaccines in the hard to reach community therefore, the study recommends that the Ministry of Health in partnership with the health personnel and also the County management team should consider increasing health education and use of additional educational strategies to educate community members on HPV vaccine, cervical cancer and HPV infection in the area.

2. Level of acceptability of HPV vaccine among guardians residing in Mandera East Sub-County, County of Mandera, Kenya.

The acceptability of HPV Vaccines was very low among the respondents. Further it was observed that low education enrollment played a key role. Moreover religion was pointed to be one of the main element that influenced guardians to not accept the Vaccines, this is due to the strong convictions in Islam in regard to premarital sexual relations and the whole sexual context. In this regard the study recommends educating religious leaders on HPV vaccine, cervical cancer and HPV infection who will in turn educate their members and this will boost the acceptability levels among the respondents and community in general.

3. Socio- cultural factors influencing the uptake of HPV vaccine among guardians residing in Mandera East Sub-County, County of Mandera, Kenya.

Socio- cultural factors had a great role to play in the acceptance / willingness among guardians to allow their daughters to get vaccinated, this was due to the patriarchal nature of Somalis and the strong values that the community upholds, even with the awareness on the HPV vaccine, the community members were unable to fully accept their adolescent

daughters to get the HPV values due to the fear that the customs, norms and values of the community will be undermined. This affected the willingness of guardians/ parents to accept the HPV vaccine. The study recommends that health care professionals and County health management team to educate their community members in regard to HPV infection, HPV vaccine and also the globalization aspect that has come up in regard to health matters.

4. Health facility based factors that influence the uptake of HPV vaccine among guardians residing in Mandera East Sub-County, County of Mandera, Kenya.

Health based facility factors that influence the uptake of HPV vaccine based on our study findings were found to be available. Availability of health services has been associated with the utilization. In places where services are not available or are partially available utilization is usually low. In regard to the availability of human resource to provide services, it was evident that healthcare workers were knowledgeable on matters regarding the HPV vaccine. It is recommended to increase awareness on the availability of HPV services through chief Barraza's, public campaigns, use of digital methods such as posters, fliers, use of religious leaders, enhancing doctors / health care workers positive recommendations on the uptake of HPV services.

5.5 Further Research Suggestions.

In this study religion was highly correlated with an acceptability of HPV vaccines among the respondents. The researcher recommends a study to establish the pathway through which religion influences low uptake of healthcare services and more specifically adoption of Vaccines.

HPV vaccination provides a chance to young adolescent girls to participate in preventive health services, this age group is mostly forgotten due to the fact that the main concentration lies with under- fives and older adolescent this forgotten age group is due to the perception that ,they are less immuno-compromised (Molyneux M.,2020). Health education on matters concerning sexual health provides an advantage in the sense that it helps in delaying early sexual onset as well as providing a source of knowledge in regard to teenage phase and coping with the changes that come during adolescent period.

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Appendices;

Appendix 1; Informed Consent Form

TITLE OF STUDY

The readiness of a guardian to provide teenage daughters in Mandera County, Kenya, with the Human Papillomavirus vaccine in order to avoid cervical cancer.

PRINCIPAL INVESTIGATOR

Ifrah surer Mohamed

School of Public Health

P. O BOX 3284, Nairobi

0722998055

Ifrahmohamed20979@gmail.com

AIM OF THE RESEARCH

Accepting your involvement in this investigation would be appreciated. Before deciding whether or not to take part, it is imperative that you are aware of the objectives of the study and the topics that will be covered. Please read the information below completely. Ask the investigator to elaborate if you have any questions or need more information. The present investigation looks into the guardians' willingness to immunize teenage daughters against the Human Papillomavirus in order to prevent cancer of the cervical cavity in hard-to-reach areas of Mandera. The results of the study will aid in bringing about systemic changes by helping to develop health promotion campaigns to increase the public's understanding.

STUDY PROCEDURES

Guardian of girls aged 9-14 years will be eligible to participate and have been residents of that County for six months. A detailed explanation about the study will be given to the contacted guardians. The research assistants will make prior appointments with the guardians requesting them to come for the survey. Explanations about filling out the questionnaire will be made clear to the participants using simpler terms in the local language.

The questionnaire will include information about the HPV vaccine, the need to assess its acceptability, socio-cultural factors affecting its uptake, and the health-based facility factors that influence the uptake of the HPV vaccine. Guardians who will consent will be included in the survey. After the consent, study numbers will be assigned serially. For both the FGDS, the key informants will take approximately one hour and 30 minutes, while the questionnaire will take 30 minutes. The participants will also be informed about tape recording to collect data.

RISKS

Every study comes with its risks and disadvantages; for our study, a few risks will come from participating in the study. The risk of feeling the questions being too personal and making the whole process uncomfortable. The feeling that cultural/religious values/norms have been disregarded may lead to some participants not completing the questionnaire or not answering some questions. Some of the risks may be minimized by using research assistants who are part of the community. Those who don't want to participate might stop at any point.

BENEFITS

The HPV vaccine, which has a significant impact on the health of female reproductive systems, will be made known through the investigation, which has advantages for both participants and the general public. Also, it is possible to prevent cervical cancer among

young girls. Communally the information from the study will help shape the health decision of the whole community at large and thus promote healthy behavior traits like; immunization of teen girls against HPV.

CONFIDENTIALITY

Anonymity will be maintained during the HPV vaccine survey. Please do not provide any personal information on the survey form. Your remarks won't be kept anonymous. The researcher will use all reasonable means, including those listed below, to protect your confidentiality.

- Code names and numbers will be given to you; write them down on all research notes and papers.
- Transcripts of interviews, notes, and any other material identifying participants will be secured by the researcher and kept in a closed file cabinet.
- The data gathered will be used in a strictly confidential manner in order to achieve the objectives of this investigation.
- The information provided by those involved will be kept private, with the exception of instances in which the researcher is compelled by law to disclose specific information. Abuse situations or suicide risk are two of these, though they do not constitute the sole ones.

- **CONTACT INFORMATION**

Let’s say you have any queries concerning this study at any moment, or you suffer negative impacts as a result of taking part in it. The researcher's contact information is listed below if that applies to you.

MKU IERC CHAIRMAN,

MOUNT KENYA UNIVERSITY, THIKA

ALUMNI PLAZA 9TH FLOOR, ROOM 904

PO BOX 342-01000 THIKA, KENYA

VOLUNTEERS PARTICIPATION

You can only participate voluntarily in this investigation. Your choice to take part in this research project is entirely up to you. You must complete a permission form in order to take part in this investigation. Even after you completed the permission form, you are still free to cancel at any time and for any reason. If you decide to leave this study, your relationship with the researcher won't change. Your data will be either eliminated or returned to you if you leave the investigation unfinished before gathering information is accomplished.

CONSENT STATEMENT

After carefully reading and comprehending the information provided, I voluntarily decide to participate in this investigation. I had the opportunity to ask questions and received all the information I required. I am aware that my involvement is optional and that I am free to end it whenever I want, without being required to give a reason. Duplicate copies of this authorization form will be sent to me.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Appendix 2; Questionnaire

Title: Guardian's willingness to vaccinate adolescent daughters against human papilloma virus for cervical cancer prevention in hard-to-reach communities in Mandera County, Kenya.

We appreciate you spending the time to complete this questionnaire. In order to prevent cervical cancer in hard-to-reach areas in Mandera County, Kenya, this study seeks to ascertain guardians' readiness to immunize teenage daughters against the human papilloma virus.

Your suggestions for this study will help medical experts create HPV immunization programs that are appropriate for women in remote areas. It costs nothing to take part in this study, and you can stop at any time if you change your mind. If a question makes you uncomfortable, you can choose not to answer it. We won't ask for your name or identity card in exchange for the data you supply for this project, which will be kept private. Gratitude again for consenting to participate in the study.

SITE
ESTATE .....
SITE .....
Serial number |___|__|__|

NNO.	INQUIRIES	REPLIES	SKIP
UNIT A; SOCIO- DEMOGRAPHICS			
1	What is your Age	1=21-25 2=26-30 3=31-35 4=36-40 5=Above 41	
2	What faith do you follow?	1= Catholic 2= Protestant 3= Muslim 4= African Traditional Religion 5 = None	
3	What level of education have you attained to date?	0 = have not gone to school 1= did not finish elementary school 2 = Primary 3 = Secondary 4= Did not complete secondary education 5 = post-secondary school	
4	What kind of marriage are you now in?	1 = Currently married	

		2= living with a man/woman as if we are married 3= Never married 4= Divorced 5= Widow/ Widower 6 = Separated	
5	Have you ever had a child?	0=No 1=Yes	
6	In such case, how many kids do you have?	1= 1-3 2=4-5 3= Above 5	
UNIT B: AWARENESS OF CERVICAL CANCER AND SCREENING			
7	Do you know what disease is called cervical cancer?	0 = No 1 = Yes	
8	No genetic disorder causes cervical cancer.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
9	There is a lengthy precancerous lesion phase for cervical cancer.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
10	Early stages of cervical cancer can be identified.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
11	If caught early enough, cervical cancer is curable.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
12	The danger of developing cervical cancer is still present in postmenopausal women.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
13	Cervical cancer is primarily brought on by the human papilloma virus.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	

14	One of the symptoms of cervical cancer is post-sexual bleeding.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
NO.	**INQUIRES**	**REPLIES**	**SKIP**
15	In the early stages of precancerous lesions, cervical cancer has no symptoms	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
16	The chance of developing cervical cancer increases with early sexual engagement.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
17	By screening, a precancerous lesion can be found.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
18	Precancerous lesions are the primary target of screening.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
19	At least every three years, women should be checked for cervical cancer.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
20	In nearby medical facilities, cervical cancer screening is accessible.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
21	Local healthcare facilities provide free cervical cancer screenings.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
22	What percentage do you think your likelihood is of getting cervical cancer?	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
23	Have you had a cervical cancer screening	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	

24	I worry a lot that I will have cervical cancer.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
25	I think my risk of getting cervical cancer is high.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
26	The likelihood of having cervical cancer is the same for all women.	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
UNIT C ; KNOWLEDGE ON HPV			
27	Have you heard of HPV?	(1). Yes (2) No (3) Do not know	
28	Do you think HPV has a role in cervical cancer development?	(1). Yes (2) No (3) Do not know	
29	Does HPV infection have no symptoms?	(1). Yes (2) No (3) Do not know	
30	Are HPV infections considered sexually transmitted diseases (STDs)?	(1). Yes (2) No (3) Do not know	
31	Can an abnormal Pap test be brought on by HPV infection?	(1). Yes (2) No (3) Do not know	
32	Are human papillomavirus and human immunodeficiency virus (HIV) distinct diseases?	(1). Yes (2) No (3) Do not know	
33	Did you know there is an HPV vaccine?	(1). Yes (2) No (3) Do not know	
SECTION 3; ACCEPTANCE OF HPV VACCINE			
34	Would you agree to let your daughter receive an HPV vaccine that can prevent her from contracting the disease?	(1). Yes (2) No (3) Do not know	
35	Do you believe there is a danger you could acquire cancer of the cervix even after receiving the HPV vaccine?	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	

36	Do you think there are any side effects of vaccine?	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
SECTION 4; SOCIO- CULTURAL FACTORS AFFECTING HPV VAACINE			
37	My culture allows children to get HPV vaccination	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
38	My religion allows children to get HPV vaccination	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
39	It is socially acceptable to give young girls HPV vaccination	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
40	It is agreeable to my partner to have our daughter get HPV vaccination	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
41	My occupation is not a hindrance to HPV vaccination for my daughter	(1)Agree(2) stongly A, (3)N (4)disagree strongly(5) D	
SECTION 5 ;HEALTH BASED FACILITY FACTORS AFFECTING HPV VACCINE			
42	Are the health services (HPV) available and accessible?	(1). Yes (2) No (3) Do not know	
43	Are the human resources available to vaccinate the young girls?	(1). Yes (2) No (3) Do not know	
44	Are the young girls aware about the HPV vaccine?	(1). Yes (2) No (3) Do not know	
45	Are the vaccines (HPV) costly to afford?	(1). Yes (2) No (3) Do not know	

Appendices 3: Focused and Key Informant Guides.

Focus Group Discussion

Study Title: Guardian Preparedness to Inoculate Teenage Daughters against Human Papilloma Virus for Cancer of the Cervix deterrence In Hard-To-Reach Groups in Mandera County Kenya.

Date:_____ Time:_____

Venue:_____

Number of participants: Male:____ Female: _____

Name of Note-taker:

_____

Introduction:

We appreciate your attendance.

I'm Ifrah Mohamed, a Mount Kenya University (MKU) master's student, and I'll be facilitating this focus group discussion.

The note-taking and recording will be done by my research assistants.

In order to reach communities in Mandera County that are difficult to reach, this discussion will examine Guardian's willingness to immunize teenage girls against the Human Papilloma Virus.

To make sure that everything mentioned is documented, this conversation will be voice-recorded and also noted on paper. We will do all in our power to keep the information private, and we won't include your identities in our reports. Only quotes from the conversation will be used in our reports. It will take about 90 minutes to have this conversation. You are not required to participate in the conversation; you are free to do so whenever you like.

Consent:

Please sign the consent documents we have given you if you accept to participate.

Ground Rules:

I want us to establish some ground rules before we begin our conversation. It should contain the following:

1. There are no right or incorrect responses; everyone is encouraged to join because our goal is to hear your ideas and opinions.
2. Put both the positive and negative aspects of any problem on display.
3. We should keep anything we discuss in this room confidential.
4. Avoid distractions and stick to one person at a time.
5. Put your phone on silent and postpone answering it until after the conversation.
6. **Ice breaker:** What vaccinations are provided to young girls that you are aware of?

1. Awareness:

a. What are your knowledge of the ongoing government program to provide the HPV vaccine to all adolescent girls between the ages of 9 and 14?

b. How much of the Mandera County population is aware of the HPV vaccine?

c. What are the primary resources for knowledge about the HPV vaccine?

d. Which sources of info do you like most??

2. Acceptability & Uptake

a) Have local authorities approved the HPV vaccine?

b) What about students' parents?

c) How are the girls utilizing the community units?

d) What are your thoughts on dropouts (i.e., those who did not finish the vaccination)?

e) Why are you declining or leaving the program?

3. **Knowledge on HPV vaccine and cervical**

a) What are your knowledge of HPV? Mode of transmission for a probe

b) What effects does HPV infection have? Check for warts, cancer of the cervical cavity, other cancers, and symptoms

c) What can be done to prevent cervical cancer?

4. **What is the average Age of school going girls in this area?**

a) Should girls in other grades who are younger or older be targeted? Question: How do you feel about the vaccine's age-appropriateness?

5. **Concerns and fears**

a) What HPV vaccine-related concerns did you have?

b) Probe: Do you have any safety concerns?

c) Did you notice any negative effects in the girls who received the vaccine?

d) What do you think about the age limit for HPV vaccine? (Is the Age appropriate or not)

5. Success

   a) How would you rate the vaccination project's effectiveness?

   b) What were the elements that made the vaccination process successful?

   c) What are the factors that prevented the vaccination process from being successful?

   6. Possibilities

6. a) How do you feel about providing additional health promotion services while the vaccination campaign is underway?

7. Questions: Could this serve as a platform for providing health education?

   b) Would this be a suitable venue for sex education?

   c) Worm elimination?

8. Any additional medical services?

9. . Development

10. Which areas do you think the programmers should work on improving? Ask: How/in what manner?

11. Parental Consent: a) In the event that a parent chooses not to vaccinate their daughter, what should be done?

    Question: Nothing?

    Vaccinate her anyhow, though?

Summary and closing remarks.

Thank you very much for your time

Appendix 4: Introductory letter from MKU

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPH/2019/48376

21st November, 2022

The Director, Research Coordination Division
National Commission for Science, Technology & Innovation
Utalii House, 8th & 9th Floor
P.O Box 30623- 00100
NAIROBI

Dear Sir/ Madam,

RE: IFRAH SURER MOHAMED ADOW – REGISTRATION NO. MPH/2019/48376

The purpose of this letter is to introduce the above named student who is pursuing **Master of Public Health** in the department of Epidemiology **and Biostatistics** in the school of **Public Health.**

The title of his research is **"Guardian Willingness to Vaccinate Adolescent Daughters Against Human Papilloma Virus for Cervical Cancer Prevention in Hard to Reach Communities in,Mandera County,Kenya ."**

He has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data for his research between **November, 2022 and February, 2023.**

Any assistance accorded to him will be highly appreciated.

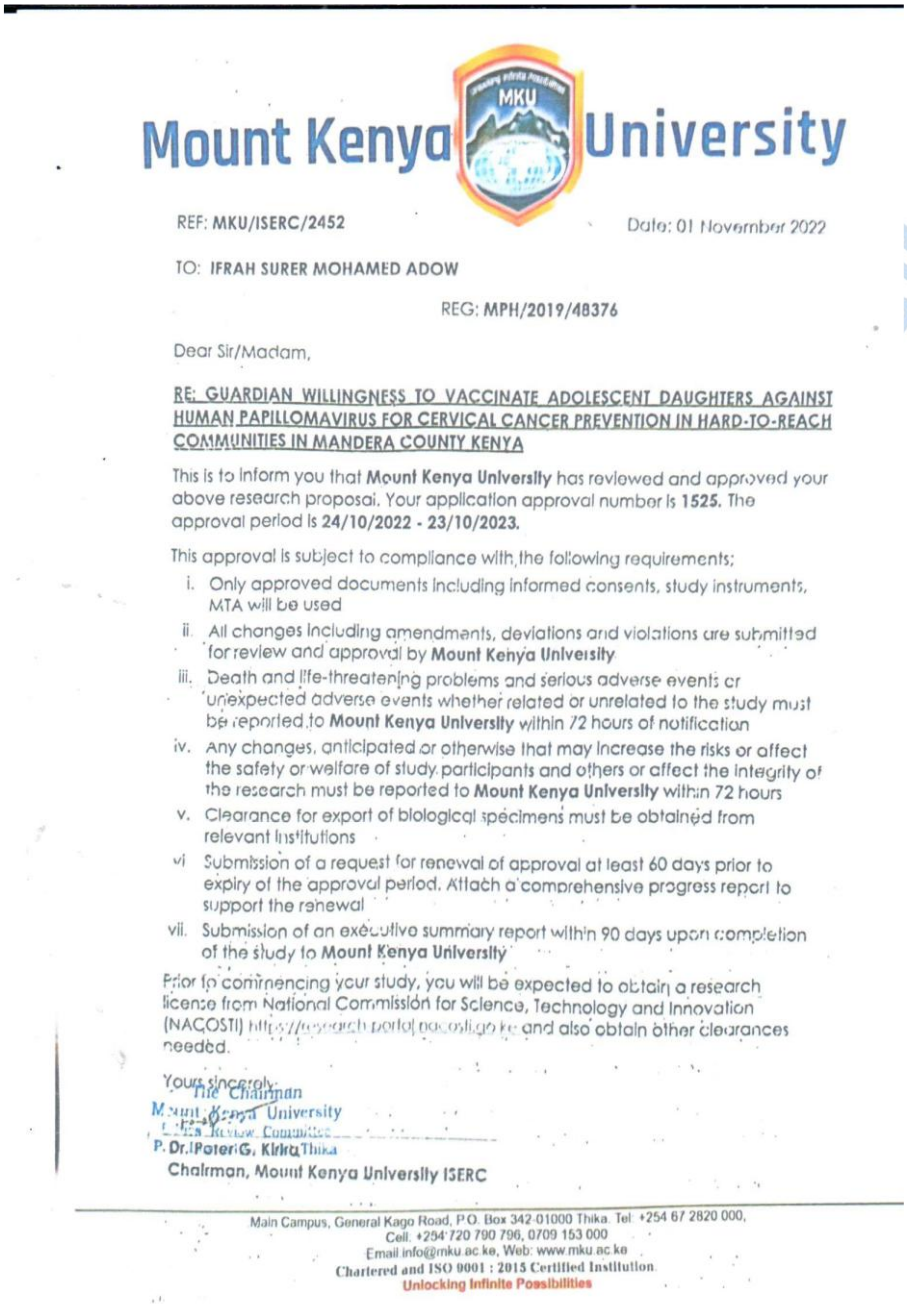
Thank you.

Mount Kenya University
P. O. Box 342 - 01000, THIKA
Office of the Director
Graduate Studies

Dr. Samuel M. Kariuki, Ph.D
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: 020-2878 000, Cell: +254 709 153 000
Email: info@mku.ac.ke, Web: www.mku.ac.ke
Chartered and ISO 9001 : 2015 Certified Institution.

Appendix 5: Ethical Review Committee (ERC) certificate from MKU



Mount Kenya University

REF: MKU/ISERC/2452 Date: 01 November 2022

TO: IFRAH SURER MOHAMED ADOW

REG: MPH/2019/48376

Dear Sir/Madam,

RE: GUARDIAN WILLINGNESS TO VACCINATE ADOLESCENT DAUGHTERS AGAINST HUMAN PAPILLOMAVIRUS FOR CERVICAL CANCER PREVENTION IN HARD-TO-REACH COMMUNITIES IN MANDERA COUNTY KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **1525.** The approval period is **24/10/2022 - 23/10/2023.**

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 **Mount Kenya University**
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 **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

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

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee

P. Dr. Peter G. Kirika Thika
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika. Tel: +254 67 2820 000,
Cell: +254 720 790 796, 0709 153 000
Email info@mku.ac.ke, Web: www.mku.ac.ke
Chartered and ISO 9001 : 2015 Certified Institution
Unlocking Infinite Possibilities

Appendix 6: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 601153

Date of Issue: 09/December/2022

RESEARCH LICENSE

This is to Certify that Ms.. IFRAH SURER MOHAMED of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Mandera on the topic: Guardian willingness to vaccinate adolescent daughters against human papillomavirus for cervical cancer prevention in hard to reach communities in Mandera County, kenya for the period ending : 09/December/2023.

License No: NACOSTI/P/22/22476

601153

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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

See overleaf for conditions

Appendix 7: Mandera East map