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***Knowledge, attitudes and uptake of COVID-19
vaccinations among health workers
at Mbarara Regional Referral Hospital***

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Abstract:

Coronavirus Disease 2019 (COVID-19) is a highly contagious infection that mainly affects the respiratory system of patients and the number of deaths is approximately five million globally with Africa having more than 4.69 million people infected with the virus since beginning of the pandemic (WHO, 2020). This study was a hospital based cross sectional descriptive design as data was collected from the participants at one point in time using a researcher administered questionnaire on a sample of 138 health workers at Mbarara Regional Referral Hospital who were randomly sampled. Data was entered into SPSS, Statistical package for social sciences, version 22.0 for analysis. Results. It was found out that majority (67.4%) had ever heard about COVID -19 vaccination and 85.5% had vaccinated. The majority believed that vaccination is safe with some side effects (87.0%). Majority (73.3%) of the participants had positive attitude towards vaccine and 26.8% had negative attitude towards vaccination. Conclusion. This study revealed that majority of the health workers generally have good knowledge about COV -19 vaccine. However, in the context of a zoonotic variant of the corona virus, vaccine hesitancy is obstructive to implementing vaccination campaigns.

Keywords:

Coronavirus Disease 2019 (COVID-19), Vaccination, health system factors, Intensive care units (ICU), oxygen and personal protective equipment (PPE)

1. Introduction:

The novel Coronavirus officially known as SARS CoV-2 virus is a highly contagious infection that mainly affects the respiratory system of patients has infected over 273 million people, and the number of deaths are approximately five million globally with Africa having more than 4.69 million people infected with the virus since the beginning of the pandemic (WHO,2020). Vaccination is the most important and reliable public health measure and most effective strategy to protect the population from COVID-19. Much as the vaccines are present, there is low uptake which is as a result of low availability of the vaccine, poor attitude and low levels of knowledge among the population due to hesitancy (WHO, 2021). Low uptake of vaccination poses the population at risk of acquiring the disease and its individuals developing complications of the same disease compared to the vaccinated communities.

2. Materials and methods

The study was a hospital based cross sectional descriptive design as data was collected from the participants at one point in time. Data was collected using a researcher administered questionnaire on a sample of 138 of health workers at Mbarara Regional Hospital who were randomly sampled.

3. Results

It was found out that majority (67.4%) had ever heard about COVID-19 vaccination and 85.5% had vaccinated. The majority believed that vaccination is safe with some side effects (87.0%), 67.4% had good knowledge about COVID-19 vaccination, 32.6% had moderate knowledge about vaccination. Majority (73.3%) of the participants had positive attitude towards vaccination and 26.8% had negative attitude towards vaccination.

4. Conclusion

This study revealed that majority of the nurses generally has good knowledge regarding COVID-19 vaccination. However, in the context of a pandemic, vaccine hesitancy is a major barrier to implementing vaccination campaigns. To maintain the benefits of vaccination programs, understanding and addressing vaccine hesitancy will be crucial to their successful implementation.

5. Background

The Corona virus is a single stranded Ribonucleic Acid Virus that belongs to the family of corona viridae and corona genus of viruses. Corona virus infection was previously not known to be lethal and its etiological role was commonly reported in common colds caused mainly by human corona viruses such as; Human Corona Virus-NL63 among others and people most at risk were children and the immune suppressed.

However, zoonotic variants of the corona virus including; severe acute respiratory syndrome-related corona virus (SARS-CoV), middle-east respiratory syndrome-related corona virus (MERS-CoV) and severe acute respiratory syndrome-related corona virus 2 (SARS-CoV-2) have been implicated in the etiology of Corona Virus Disease(COVID-19) that has ravaged nations in pandemic proportions since its break out in early 2020when its associated mortality was first reported be 46.4% (Velasco et al., 2021).

Corona virus has a small particle that contains proteins units' outer coat. Its virus-like particles do not contain any genetic material, hence cannot cause infection and are used to make vaccines that boost the body's immune system against COVID-19 infection.

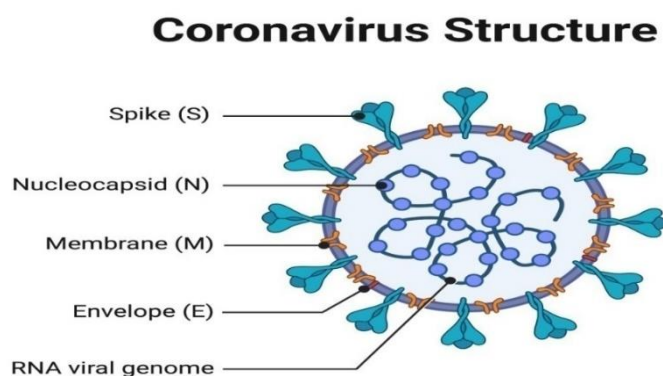


Figure.1: The Structure of the corona virus particle

In March 2020, the novel corona virus disease was declared a global pandemic after it had emerged in Wuhan, China in November 2019 and by the 28th of March 2021, there were 126,359,540 confirmed cases of COVID-19 infection, 9,866,477 Hospitalizations, 90,355,099 recoveries and 4,501,944 deaths worldwide (Agyekum et al., 2021).

By May 2021, the Africa Centers for Disease Control and Prevention (CDC-Africa) confirmed over 34.3 million cases of COVID-19, with over 108,307 deaths across the African region with Southern Africa reporting the highest and central Africa having the lowest burden of the infection. The first case of the infection in Sub-Saharan Africa was reported on 28th January 2020 (Adams et al., 2021) but like most high-income countries, many countries, this region

has already experienced a third and fourth waves of the pandemic, which suggests need to further strengthen public health control measures including vaccination in order to curtail the spread of Corona Virus disease (Kamacooko et al., 2021).

By 27th July 2021, Uganda had 92,795 confirmed cases and recorded 2,590 deaths. Challenges such as limited number of health workers, poorly equipped hospitals, poor health worker motivation, and inadequate medical infrastructure like ventilators, intensive care units (ICU), oxygen and personal protective equipment(PPE) among others have been documented to affect the quality of medical care given to COVID-19 patients in resource limited settings like Uganda (Kasozi et al., 2021).

Other factors that have contributed to poorer prognostic outcomes in COVID-19 include; advanced patient age and co-morbidities such as diabetes, hypertension, cancer, HIV, and cardiovascular diseases among others (Kamacooko et al., 2021) which are also very common in our setting.

Health workers have been at the forefront in the fight against COVID-19. However, unfortunately, for various reasons they have not been spared by the pandemic as many have contracted the infection with some succumbing to it. This notion is further supported by the September 2021 WHO statistics which indicated that globally, as many as 570,000 health workers had been confirmed with the infection and 2,500 had died of it. For example, anecdotal data at Mbarara Regional Referral Hospital staff indicates that during the second quarter of the 2021/22 financial year, there were 650 COVID-19 positive patients of whom 60% were health workers. This signals great danger considering the pivotal role of the health worker in the well being of society. Such high numbers of affected health workers would fuel fear of attending to Covid-19 patients especially in the setting of limited or no PPEs.

Vaccination has been shown to help prevent COVID-19 infection, reduced the severity of adverse symptoms and the risk of death by 90%. However, despite this proven benefit, the uptake of COVID-19 Vaccination in our setting is still low. As of May 2021, only 18.3% of the African total workforce had gotten vaccinated against COVID – 19, and of these, 89% were health care workers in urban centers particularly in capital cities (Cooper et al., 2021).

This study intends to use alternative hypothesis. Alternative hypothesis is when a strong association has been met between independent variables and dependent variable.

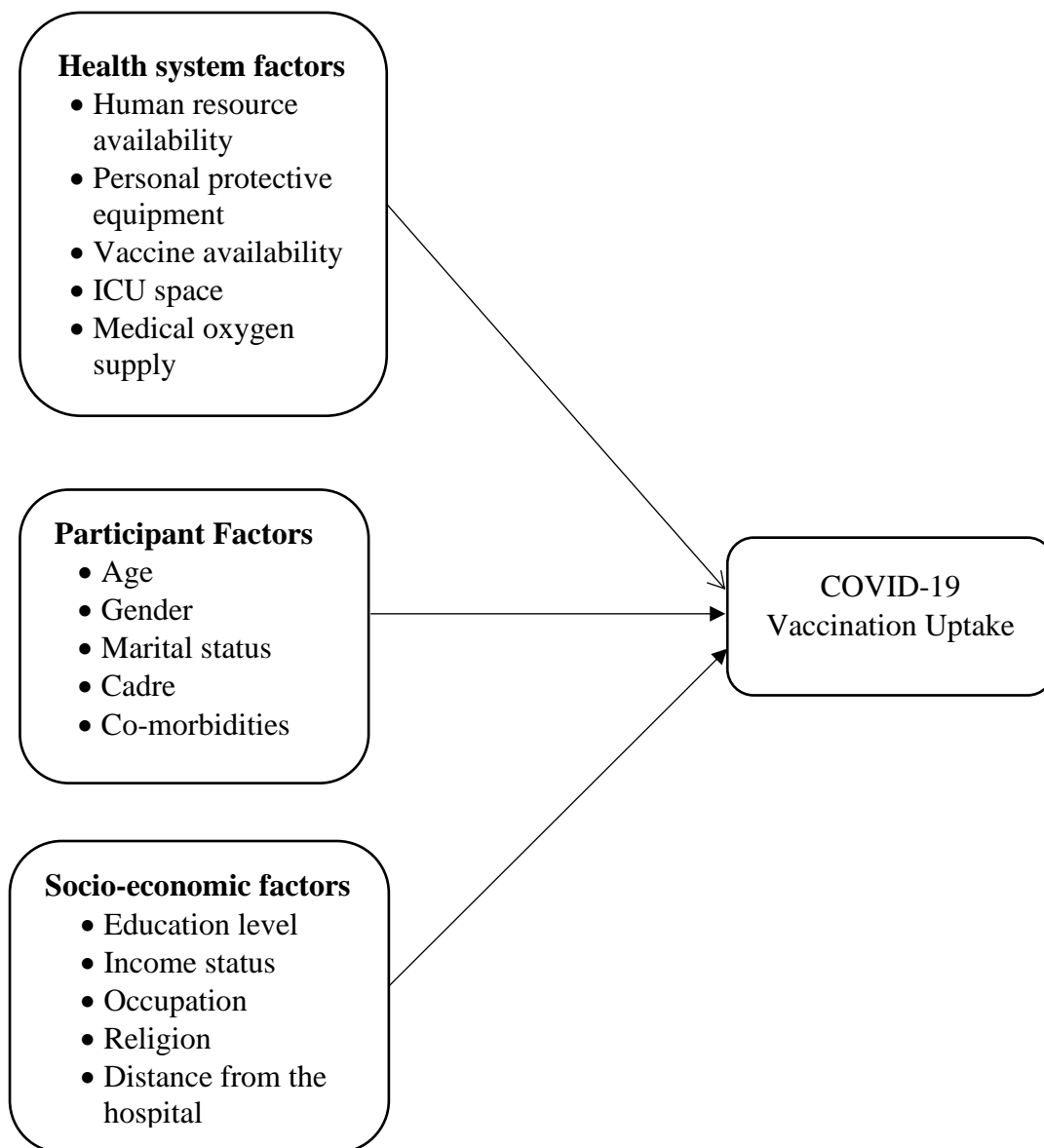


Figure 2: Conceptual frame work

6. Methods:

6.1. Study Site:

The study was conducted at Mbarara Regional Referral Hospital which is under ministry of health located in the Mbarara city and in Kamukuzi division. The Hospital is in the western Uganda with a bed capacity of 600 and serves a population of about 25000 from districts of Mbarara, Kasese, Masaka, Ntungamo, Isingiro, Kiruhura, Kazo, Ibanda, Kitagwenda, Mitooma, Lyantonde, Rakai and neighboring countries like Rwanda, Tanzania and Congo.

At Mbarara Regional Referral Hospital, prospective vaccination of patients comes in through the outpatient immunization clinic which runs 5 days a week. The health facility has 250 health

workers including; 180, 11 clinical officers, 15 laboratory technicians, 7 counsellors, 10 Medical officers, 6 medical official grade, 5 consultants and The Hospital started offering COVID-19 vaccination in July 2021, receives about 100 to 150 Clients weekly and has so far vaccinated a total of 13847 clients for covid-19.

6.2. Study Design:

This was descriptive Hospital based cross-sectional study. Mbarara Regional Referral Hospital was chosen because of convenience as it is easier to reach by the principal investigator.

Population

Target Population: This included all Health workers between 20 to 60 years at Mbarara Regional Referral Hospital during the study period.

Study Population: This included all health workers who were present during the study period.

Eligibility Inclusion Criteria: In the study, included all health workers who were 20 years and above who voluntarily written informed consent to participate in the study.

Exclusion Criteria:

- Non-health workers were excluded
- Those who were below 20 years
- Absent at the facility during the study period
- Those who declined to consent to participation

Sample Size Determination: Yamane formula (1975) was used to calculate the sample size, where n is the sample size, N is the population size and e is the level of precision. Hospital has averagely 210, so our N=210

$$n = \frac{N}{1 + N(e)^2}$$

n = $\frac{210}{1 + 210(0.05)^2}$

n = 138 participants

Sampling Procedure: Consecutive sampling method was used until the required sample size was attained.

Data Collection Procedure: Data was collected by the principal investigator. For participants who satisfied the inclusion criteria, the principal Investigator explained the purpose of the study in a language they best understood and their written consent/assent was sought. The PI then conducted a structured interview.

Data collection Tools: Data was collected using a structured questionnaire which is divided into four sections.

- The first section captured participants' identifiers such as; study ID, date of enrollment, and health cadres/job position.
- The second section captured capture participants' Socio-demographic characteristics such as the age, gender, address, and the family socioeconomic status.
- The third section captured the level of knowledge about Covid-19 vaccination among the Health workers.
- The fourth section captured information on the attitudes and challenges that health workers at Mbarara regional referral hospital perceive to hinder their acceptability of-19 vaccinations.

6.3. Quality Control:

Before commencement of data collection, the study tool was pretested on a few health workers and the outcomes of the pretest was reviewed to check if all questions are well understood by the respondents, necessary adjustments were made to it.

For accuracy of the outcomes, all interviews were conducted by the principal investigator and periodic reviews or the filled data collection tools were done by the research supervisor.

6.4. Ethical Considerations:

Prior to commencement of the study, the study protocol was submitted to the department of Nursing Science, Bishop Stuart University Mbarara District Health Office and Mbarara Regional Referral Hospital administration for their consideration, guidance and approval.

Informed consent was obtained in writing and for confidentiality purposes, unique Health Workers Codes were used in place of participant names on the questionnaires.

Their personal information was protected by limiting access to the data collection tools to only the principal investigator and research supervisor and the computer used for data entry, storage

and analysis was also kept password protected and access was only granted to the principal investigator.

It was made clear to participants that there was no monetary incentives for participation in the study and that participation is voluntary and the participant was free to decline participation and withdraw his/her consent at any time during the interview without reprisal.

For those that choose to withdraw their consent, their information was not used in the final analysis.

6.5. Data Management:

Data was entered into SPSS, Statistical package for social sciences, version 22.0 for analysis. Participant's baseline characteristics have been described using means, medians for continuous variables and proportions for categorical variables and presented in a table.

The proportions of the different knowledge questions answered correctly was calculated and presented in tables as frequencies or graphs. Stratified analysis was conducted to compare the frequency of each knowledge aspect across age, sex, health cadre and duration in service using Chi-square test.

6.6. Dissemination Plan:

A written dissertation was prepared and results presented to the Bishop Stuart University Nursing department.

Upon approval, copies of the printed results will be shared with the Nursing department, School of Nursing, Bishop Stuart University library, Mbarara district health office and Mbarara Regional Referral Hospital.

A manuscript will be prepared and submitted to a peer review journal for publication.

Anticipated Study Limitations:

Due to the small sample size in this study, the findings were not generalizable to all health Workers in Uganda.

This study focused on perceived challenges that hindered acceptance of COVID-19 vaccination and therefore some information was hidden by health workers.

Performing a statistical analysis for factors associated with acceptance allowed a more accurate causal inference for poor vaccination uptake in the setting.

7. Results:

7.1. Introduction

This chapter presents the findings on the knowledge, attitudes and Uptake of COVID19 vaccination among Mbarara Regional Referral Hospital Staff. The findings were from both primary and secondary sources. The analysis is based on the research questions and the presentation and the interpretation done with the help of tables, and narrative text as follows. The findings are presented in accordance of three research objectives namely;

1. To measure the level of uptake of COVID-19 vaccine among health workers at Mbarara regional referral.
2. To assess the level of knowledge about COVID -19 vaccination among health workers at Mbarara Regional Referral Hospital.
3. To assess the attitudes of health workers at Mbarara Regional Referral Hospital towards COVID-19 vaccination. The results are presented in tables and in form of frequency counts and percentages.

7.2. Socio Demographic Characteristics of Study Participants

This section presents the respondent's demographic characteristics that were considered significant to the study during data collection. These characteristics included respondents' age, gender, tribe, religion, marital status, level of education and academic qualifications.

Table 1: Showing Scio- Demographics of the study participants

Variable	Category	N (%)
Age	20-23	25(18.1)
	24-29	46(33.3)
	30-35	32(23.2)
	36-49	23(126.7)
	>50	12(8.7)
Gender	Male	57(41.3)
	Female	81(58.7)
Tribe	Munyankole	86(62.3)
	Mukiga	25(18.1)

	Muganda	15(10.9)
	Mufumbira	12(8.7)
Religion	Protestants	71(51.4)
	Catholics	46(33.3)
	Born again	10(7.2)
	Moslem	6(4.3)
	SDA	5(3.6)
Marital status	Married	87(63.0)
	Single	43(31.2)
	Cohabiting	8(5.8)
Level of education	Certificate	17(12.3)
	Diploma	68(49.3)
	Degree	53(38.4)
Qualification level	Nurse	97(70.3)
	Clinical officers	19(13.8)
	Laboratory personal	8(5.8)
	Midwife	7(5.1)
	Doctor	7(5.1)

Age: The results indicated that the majority are in the age group of 24-29years where n = 46(33.3%) followed by age group 30-35 with n = 32(23.2%) followed by 20-23years with n = 25(18.1%). The least were the ones in the age groups above 50 with n = 12(8.7%).

Gender: There were more females, n = 81(58.7%) than males with n = 57(41.3%)

Tribe: The majority were Banyan kore with n = 86(62.3%), followed by Bakiga with n = 25(18.1%), then Baganda with n = 15(10.9%) and the least were Bafumbira with n = 12(8.7%).

Religion: Majority were protestants, n=71(51.4%) followed by Catholics with n = 46(33.3%), then born against with n =10(7.2%) and the least were SDAs with n = 5(3.6%).

Marital Status: The majority were married with n = 87(63.0%), followed by the ones who were single with n = 43(31.2%) and the least were cohabiting with n=8(5.8%).

Level of Education: Majority were at a diploma level with n=68(49.3%), followed by the ones of degree level with n = 53(38.4%) and the least were the ones of certificate with n = 17(12.3%)

Qualification Level: Majority were nurses with n = 97(70.3%) followed by clinical officers with n = 19 (13.8%), then laboratory personnel with n = 8(5.8%) followed by midwives and doctors both with n = 7(5.1%).

7.3. Knowledge Levels about Vaccination of Participants:

The table-2 below shows different responses of study participants in assessment of their knowledge about COVID-19 Vaccination.

Table. 2: Knowledge Levels about Vaccination of Participants

<i>Variable</i>	Responses	N(%)
<i>Vaccination awareness</i>	No	3(2.2)
	Yes	135(97.8)
<i>Information source</i>	News media	115(83.3)
	Social media	103(74.6)
	Religious leaders	78(56.5)
	Official websites	69(50.0)
	Word of mouth	63(45.7)
<i>Vaccine safety</i>	safe without side effects	120(87.0)
	Not safe with obvious	15(10.9)
	Side effects	3(2.2)
	Safe without side effects	
<i>Vaccines used in Uganda</i>	AstraZeneca	135(97.8)
	Johnson Johnson	125(90.6)
	Moderna	126(91.3)
	Covaxin	27(19.6)
	Pfizer	111(80.4)
<i>WHO recommended time interval</i>	3-4 weeks	69(50.0)
	5-6 weeks	60(43.5)
	1-2 weeks	9(6.5)
<i>Offers protection</i>	Yes	121(87.7)
	No	17(12.3)
<i>Given via injection</i>	Yes	133(96.4)
	No	5(3.6)

<i>Given as inactivated virus</i>	Yes	106(76.8)
	No	3(2.2)
	Don't known	29(21.0)
<i>Getting infected after vaccination</i>	Yes	128(92.8)
	No	10(7.2)
<i>Getting vaccinated while Covid 19 positive</i>	Yes	57(41.3)
	No	81(58.7)
<i>Vaccinated with a differed vaccine</i>	Yes	115(83.3)
	No	23(16.7)
<i>Vaccine useful</i>	Yes	118(85.5)
	No	20(14.5)
<i>Safety</i>	Yes	101(73.2)
	No	37(26.8)
<i>Perceived Knowledge</i>	side effects	20(14.5)
	trust issues	17(12.3)
	Boast immunity	50(36.2)
	Offer protection	50(36.2)
<i>Advise another person to take it</i>	Yes	116(84.1)
	No	22(15.9)

Awareness: Results revealed that majority n =135(97.8%) are aware of COVID 19 vaccination, while only n = 3(2.2%) were not aware of COVID 19 vaccination.

Source of Information: Results revealed that majority n =115(83.3%) accessed the information from the news media followed by n =103(74.6%) who accessed the information through social media, followed by n = 78(56.5%) who got information via religious leaders, n = 69(50.0%) who got information through official websites and finally n = 63(45.7%) who got information through word of mouth.

Vaccine Safety: Majority, n = 120(87.0%) believed that COVID 19 vaccine is safe with some side effects, followed by n = 15(10.9%) who believed that it is not safe with obvious side effects and lastly n = 3(2.2%) who believed that it is safe with no side effects.

Vaccine Dosage: Majority n =116(84.1%) responded that only 2 doses of the vaccine are given followed by n = 84(60.9%) who responded that only 1 dose is given and finally n = 41(29.7%).

Vaccines used in Uganda: Majority reported that AstraZeneca, n = 135(97.8%), followed by Moderna, n = 126(91.3%), followed by Johnson Johnson, n =125(90.6%) followed by Pfizer, n =111(80.4%) and lastly was Covaxin with n = 27(19.6%).

WHO Recommended Time Interval: Majority n = 69(50.0%) responded that the time interval between the doses is 3-4weeks, followed by those who reported that it is 5-6weeks with n = 60(43.5%) and lastly those who responded that it is 1-2weeks with n = 9(6.5%).

Vaccine Protection: Majority of the participants n = 121(87.7) reported that the vaccine offers protection against COVID 19 whereas n = 17(12.3%) denied this.

Vaccine given as Inactivated Virus: Majority of the participants n = 106(76.8%) reported that the vaccine is given as an inactivated corona virus, followed by those who reported that they don't know n = 29(21.0%) and lastly by those who denied n = 3(2.2%).

Getting Infected after Vaccination: Majority of the participants n = 128(92.8%) said that one can get infected after vaccination whereas n = 10(7.2%) disagreed with this.

Vaccinated with different Vaccine: Majority of the participant's n = 115(83.3%) said that one can be vaccinated with a different vaccine whereas n = 23(16.7%) said that it can't.

Vaccination Safety: Majority of the participants n = 101(73.2%) said that vaccination is safe whereas n = 47(26.8%) said that it's not safe.

Advise another person to take it: Majority of the participants said that they can advise any other person to take the vaccine n = 116(84.1%) whereas n = 22(15.2%) said that they cannot.

7.4. UPTAKE of COVID19 Vaccination:

Results about uptake of Covid19 Vaccination among health workers working with Mbarara Regional Referral Hospital were captured and presented in table-3 below.

Table-3: Showing UPTAKE of COVID 19 Vaccination Participants

Variable	Responses	N(%)
COVID vaccination	Yes	118(85.5)
	No	20(14.5)
	AstraZeneca	88(63.8)
	Moderna	7(5.1)
	Johnson Johnson	27(19.6)
	1 dose	36(26.1)

	2 doses	96(69.5)
	3 doses	6(4.4)

Results from table.3 reveal that majority of the study participants had vaccinated against COVID 19 n = 118(85.5%) while n = 20(14.5%) not vaccinated against COVID 19. Most of them, n = 88 (63.8%) being vaccinated with AstraZeneca, n = 27(19.6%) with John Johnson and n = 7(5.1%) with Moderna. The higher number of doses was 2doses with n = 96(69.5%), followed by one dose with n = 36(26.1%) and lastly 3doses with n = 6(4.4%).

7.4. Factors Influencing COVID19 Vaccination:

Below are some of the factors that were highlighted by the participants where participants had to choose al, the factors that contributed to their decision to either vaccinate or not to vaccinate against Covid19. The results are presented in table-4 below.

Table. 4: Factors influencing COVID19 Vaccination

<i>Variable</i>	<i>Response</i>	<i>N (%)</i>
<i>Facilitators</i>	Desire to protect self	112(81.2)
	Desire to protect friends and family	98(71.0)
	Desire to travel freely within and abroad	65(47.1)
	compulsory in the work place	64(46.4)
<i>Barriers</i>	Concern about the side effects	18(13.0)
	Concern about the safety of the vaccine	14(10.1)
	Plan to wait and take it later	12(8.7)
	Myths and conspiracy about the vaccine	7(5.1)

Results above revealed that;

Facilitators; for the uptake of vaccination were, desire to protect self n=112(81.2%) followed by desire to protect friends and family n=98(71.0), travel purpose n=65(47.1) and the least was compulsory at work place n=64(46.4).

Barriers; results above revealed that barriers include people concerned about the side effects $n = 18(13.0)$, concern about the safety of the vaccine $n = 14(10.1)$, followed by plan to wait and take it later $n = 12(8.7)$ and lastly myths and conspiracy about the vaccine $n = 7(5.1)$

8. Discussion

8.1. Introduction

This section of the research report discusses the entire findings of the study presented in chapter four bringing out the findings for each research question. The researcher also linked the findings of the study to the literature reviewed in chapter two. The last section dealt with conclusions drawn and recommendations of the study.

8.2. Knowledge and Attitudes of Health Workers Towards Covid Vaccination.

Having good knowledge and attitude towards vaccination is key in utilization of Covid Vaccination among health workers (Esimone et al., 2021).

While vaccines are known to be successful public health measures, an increasing number of health workers believe vaccines are neither safe nor necessary because of poor knowledge and attitudes among them towards vaccination (Ciardi, Kumar et al., 2021). So this study assessed knowledge attitudes and uptake of Covid Vaccine among health workers.

8.3. Levels of Awareness about COVID-19 Vaccination

In this study, majority of the participants had good knowledge in the following questions, (COVID-19 stimulates immunity, Vaccination provides protection, provide protection to others, COVID -19 vaccine is via injection, COVID-19 vaccines use inactivated corona virus, vaccine being safe with some side effects, Ever heard of COVID-19 vaccination, Can one get infected after vaccination).

Participants who said that vaccination protection for life long were considered to have knowledge, also participants who said NO on, “can one be vaccinated while suffering from COVID-19” were considered to have good knowledge.

A study conducted in Iran reported that 38% of health Centre staff had fears of vaccine side effects (Elhadi et al., 2021). Some would delay their vaccination in order to observe what happens to those who get vaccinated first while others believed that since they did not possess comorbidities, they had less risk and did not need to get vaccinated, some though reported that

the vaccine would worsen their living due to vaccination-related illness, some believed the disease is not dangerous, and that they have natural resistance to help them fight the infection (I det, Hassan et al., 2021).

In this study, majority of the participants were aware of COVID-19 vaccination. These results are higher than a study done about Knowledge, attitude and practice towards COVID-19 vaccination acceptance in West India where only a few of the respondents were aware of COVID-19 vaccine, with rest either believing that it did not exist, or they didn't know about Covid Vaccination (Kumar et al., 2021). This is due to the fact that COVID-19 Vaccination programme was launched and started with health workers themselves.

This study shows most source of the information about COVID-19 vaccination included official news media which is higher than a similar study done in Bangladesh on Knowledge, attitudes and perceptions towards COVID-19 vaccination where social media was the source that was reported by significant number of the respondents (Islam et al., 2021). These results were due to the fact that these health workers have access to hospital internet and so they are always updated.

In another study conducted in Iran found out that the most source of information was media which is in line with my findings (Hassen et al., 2021). This is because government emphasized sensitization on all medias and thus all people could access information easily which increased their knowledge and awareness.

In this study, majority believed that the vaccine is safe with some side effects. These results were higher than those of the same study done on knowledge, attitudes, and practices towards the COVID-19 Vaccine in Oman (Ahlam et al., 2021). This is basically attributed to the fact that the vaccine itself offers protection to the body and at the same time it has side effects like headache, dizziness, fever and many others.

This was reported in another study done in Hong Kong that found out most participants believed that Covid Vaccine was safe but had mild effects (Ciardi et al., 2021).

A study conducted among nursing staff in Hong Kong which reported a 40% acceptance rate for COVID-19 vaccination also identified inadequate knowledge about COVID-19 vaccination whereby health care staff reported that vaccination against pneumonia, the use of certain antibiotics can also protect them against COVID-19 infection. This could have contributed to the low vaccination uptake in that study (Ciardi et al., 2021).

While vaccines are known to be successful public health measures, an increasing number of people believe vaccines are neither safe nor necessary. This behavior is determined by issues

of confidence or trust in the vaccine or provider, perceived lack of need or value for the vaccine and issues with access to the vaccine (Ciardi et al., 2021).

Most people have fear towards the COVID-19 vaccine because they doubt the quality and safety of the vaccine due its expedited development and approval. A study done in United Kingdom reported fear about COVID-19 vaccination resulting into actual COVID-19 infection among health professionals and support staff as one of the reasons for vaccine hesitancy (Hassen et al., 2021).

8.4. Attitudes of Health Workers towards COVID-19 Vaccination:

In this study, participants were referred to have positive attitude if they thought that COVID-19 vaccine is useful, those who thought that it's safe to vaccinate and those who thought that vaccination is not useful and not safe were considered to have a negative attitude.

Majority of the study participants were willing to take up any approved vaccine which is a bit higher than the study done on Knowledge, Attitudes and Perceptions of COVID-19 Vaccination among healthcare workers of an Inner-City Hospital in New York where respondents were willing to be vaccinated within 30 days, and a further a few respondents willing after six months. (Ciardi et al., 2021). This comes with the fact that health workers have gained trust to the ministry of health.

Very few of the participants were not willing to take up vaccination which is lower than that done on acceptance of the coronavirus disease -2019 vaccine among medical students in Uganda where the majority of the participants were not willing to be vaccinated against COVID-19 (Kanyike et al., 2021). This may be attributed to the common side effects had been experienced by those who had previous vaccinated.

Majority of the study participants would recommend family members and friends to vaccinate which is better off than that in Oman on Knowledge, Attitudes, and Practices (KAP) toward the COVID19 Vaccine which is slightly lower (Ahlam et al., 2021), also higher than that done in Bangladesh on Knowledge, attitudes and perceptions towards COVID-19 vaccinations.

8.5. Uptake of COVID-19 Vaccination

Astra Zenecawas the most used vaccine reported in this study. It was followed by Johnson and Johnson. This is because AstraZeneca was the first vaccine to be introduced in Uganda. The findings of this study were consistent with those of a Canadian University study in which majority of the participants had received AstraZeneca vaccine (Madalein, Pakonhetal.,2021).

The least used vaccine reported in this study was Moderna. This is because it was introduced last when most of health workers had vaccinated and also was restricted for children only since it had less side effects,

On number of doses, most participants in this study had taken two doses of vaccine. This is because most had received dose of AstraZeneca that required only two doses and also most health workers reported why they received two doses it was convenient and safe for them. These findings are consistent with a study co-ordinated in Hong Kong where most participants had received two doses of AstraZeneca (Cooper et al., 2021). However a study conducted in South Africa on knowledge and uptake of Covid Vaccination found out that most participants had only taken one dose of Covid Vaccine. This is because most participants had bad attitude towards Covid Vaccination (Suhlen et al, 2020).

9. Conclusion

Despite the efforts by Government to provide mass vaccination to Health Workers, the uptake of COVID19 Vaccine among adolescents still remains suboptimal. In addition, this study seems to suggest that factors that influence the uptake of COVID 19 Vaccination among health workers is poor knowledge, bad attitude and lack of awareness about COVID Vaccines.

If mass Vaccination is to successfully work among health workers. Government needs to continuously sensitize and advocate for Vaccination among Health workers since they are role models to the public and they are front liners in handling this pandemic. Finally, and perhaps most importantly, Health Workers will need to understanding and addressing vaccine hesitancy will be crucial to the successful implementation. Developing tailored strategies like Continuous Medical Education (CMEs) to address concerns identified in the study to decrease vaccine hesitancy will be the key to success.

10. Recommendations

10.1. Policy

The government through ministry of health should strengthen the COVID-19 vaccination awareness campaign, focusing on people living in rural areas by making relatively more detailed information readily available through easily accessible communication channels like local radio stations, and health education programs at health facilities and community health out reaches.

The government should also expand its mass COVID-19 immunization campaign to reach local areas. The immunization services should also be incorporated into the health care package given as part of outpatient service in government health facilities.

The government should also combat negative information circulating on social and news media replacing it with correct and rightful information as far as COVID-19 vaccination is concerned.

10.2. Research

To future researchers, a study should be done to assess factors affecting the knowledge and attitude of the entire population regarding COVID-19 vaccination.

10.3. Health Care Practice

It will help to improve attitudes of nurses towards COVID 19 Vaccination since they will get more knowledge on vaccination and avoid some of myths and beliefs about vaccination.

10.4. Strengths and Limitations of the Study

Participants had equal chances of participation hence no biased information. Sampled participants were representative of the study population. Quantitative research methods were employed, and data was analyzed using appropriate statistical tests to minimize errors.

It could be true that the highest percentage of knowledge and attitude could be due to age and level of education since most of the participants were adults and always get information from social media that is highly informed.

There was limited time to collect data and also it was hard to get health workers who were not on duties due to their busy schedule of work.

11. References:

1. Abdur, B., & Alfa, R. (2020). Africa COVID-19 stats : 874 , 036. 1–15.
2. Adams, J., Mackenzie, M. J., Amegah, A. K., Ezeh, A., Gadanya, M. A., Omigbodun, A., Sarki, A. M., Thistle, P., Ziraba, A. K., Stranges, S., & Silverman, M. (2021). □ The Conundrum of Low COVID-19 Mortality Burden in sub-Saharan Africa : Myth or Reality ? 1–24.
3. Agyekum, M. W., Afrifa-Anane, G. F., Kyei-Arthur, F., & Addo, B. (2021). Acceptability of COVID-19 Vaccination among Health Care Workers in Ghana. *Advances in Public Health*, 2021. <https://doi.org/10.1155/2021/9998176>

4. Bandyopadhyay, S., Baticulon, R. E., Kadhum, M., Alser, M., Ojuka, D. K., Badereddin, Y., Kamath, A., Parepalli, S. A., Brown, G., Iharchane, S., Gandino, S., Obiagio, Z. M., Scott, S., Manirambona, E., Machhada, A., Aggarwal, A., Benazaize, L., Ibrahim, M., Kim, D., ... Muchemwa, F. C. (2020). Infection and mortality of healthcare workers worldwide from COVID-19 : a systematic review. <https://doi.org/10.1136/bmjgh-2020-003097>
5. Bauernfeind, S., Hitzentbichler, F., Huppertz, G., Zeman, F., & Koller, M. (2021). Brief report : attitudes towards Covid - 19 vaccination among hospital employees in a tertiary care university hospital in Germany in December 2020. *Infection*. <https://doi.org/10.1007/s15010-021-01622-9>
6. Cascini, F., Pantovic, A., Al-ajlouni, Y., Failla, G., & Ricciardi, W. (2021). *EClinicalMedicine* Attitudes , acceptance and hesitancy among the general population worldwide to receive the COVID-19 vaccines and their contributing factors : A systematic review. *EClinicalMedicine*, 40, 101113. <https://doi.org/10.1016/j.eclinm.2021.101113>
7. CDC, A. (2020). Outbreak Brief# 11 : Coronavirus Disease 2019 (COVID-19) Pandemic. 2019(March), 1–7.
8. Cooper, S., van Rooyen, H., & Wiysonge, C. S. (2021). COVID-19 vaccine hesitancy in South Africa: how can we maximize uptake of COVID-19 vaccines? *Expert Review of Vaccines*, 00(00), 1–13. <https://doi.org/10.1080/14760584.2021.1949291>
9. Crawshaw, J., Konnyu, K., Castillo, G., Allen, Z. Van, Mba, M. A., Grimshaw, J., & Presseau, J. (2021). Factors affecting COVID-19 vaccination acceptance and uptake among the general public: a living behavioural science evidence synthesis. 1, 1–54.
10. Donbak, N. (2021). Are health care workers in Africa getting vaccinated? | Devex. <https://www.devex.com/news/are-health-care-workers-in-africa-getting-vaccinated-99848>
11. Echoru, I., Ajambo, P. D., Keirania, E., & Bukenya, E. E. M. (2021). Sociodemographic factors associated with acceptance of COVID-19 vaccine and clinical trials in Uganda : a cross-sectional study in western Uganda. 1–8.
12. El-elimat, T. (2021). Acceptance and attitudes toward COVID-19 vaccines : A cross-sectional study from Jordan. 1–17.
13. Elhadi, M., Alsoufi, A., Alhadi, A., Hmeida, A., Alshareea, E., Dokali, M., Abodabos, S., Alsadiq, O., Abdelkabir, M., Ashini, A., Shaban, A., Mohammed, S., Alghudban, N., Bureziza, E., Najah, Q., Abdulrahman, K., Mshareb, N., Derwish, K., Shnfier, N.,

- Algathafi, K. (2021). Knowledge , attitude , and acceptance of healthcare workers and the public regarding the COVID-19 vaccine : a cross- sectional study. 1–21.
14. Fakonti, G., Kyprianidou, M., Toumbis, G., & Giannakou, K. (2021). Attitudes and Acceptance of COVID-19 Vaccination Among Nurses and Midwives in Cyprus : A Cross-Sectional Survey. 9(June), 1–10. <https://doi.org/10.3389/fpubh.2021.656138>
 15. Hassen, M., Id, A., Kanfe, S. G., & Jarso, M. H. (2021). Intention to receive vaccine against COVID-19 and associated factors among health professionals working at public hospitals in resource limited settings. 1–10. <https://doi.org/10.1371/journal.pone.0254391>
 16. Id, T. E., Abualsamen, M. M., Almomani, B. A., Al-, N. A., & Alali, F. Q. (2021). Acceptance and attitudes toward COVID-19 vaccines : A cross-sectional study from Jordan. 816, 1–15. <https://doi.org/10.1371/journal.pone.0250555>
 17. Kamacooko, O., Kitonsa, J., Bahemuka, U. M., Kibengo, F. M., Wajja, A., Basajja, V., Lumala, A., Kakande, A., Kafeero, P., Ssemwanga, E., Asaba, R., Mugisha, J., Pierce, B. F., Shattock, R. J., Kaleebu, P., & Ruzagira, E. (2021). Knowledge , Attitudes , and Practices Regarding COVID-19 among Healthcare Workers in Uganda : A Cross-Sectional Survey. May, 1–12.
 18. Kasozi, K. I., Laudisoit, A., Osuwat, L. O., Batiha, G. E.-S., Omairi, N. E. Al, Aigbogun, E., Ninsiima, H. I., Usman, I. M., DeTora, L. M., MacLeod, E. T., Nalugo, H., Crawley, F. P., Bierer, B. E., Mwandah, D. C., Kato, C. D., Kiyimba, K., Ayikobua, E. T., Lillian, L., Matama, K., ... Welburn, S. C. (2021). A Descriptive-Multivariate Analysis of Community Knowledge, Confidence, and Trust in COVID-19 Clinical Trials among Healthcare Workers in Uganda. *Vaccines* 2021, Vol. 9, Page 253, 9(3), 253. <https://doi.org/10.3390/VACCINES9030253>
 19. Krejcie. (1970). Sample Size Determination Using Krejcie and Morgan Table – Kenya Projects Organization [KENPRO]. <http://www.kenpro.org/sample-size-determination-using-krejcie-and-morgan-table/>
 20. Mersha, A., Shibiru, S., Girma, M., Ayele, G., Bante, A., & Kassa, M. (2021). Perceived barriers to the practice of preventive measures for COVID-19 pandemic among health professionals in public health facilities of the Gamo zone , southern Ethiopia : a phenomenological study. 1–10.
 21. Mwaniki, M. (2021). Kenya completes its first round of COVID-19 vaccinations | Gavi, the Vaccine Alliance. <https://www.gavi.org/vaccineswork/kenya-completes-its-first-round-covid-19-vaccinations>

22. Olum, R., Chekwech, G., Wekha, G., Nassozi, D. R., & Bongomin, F. (2020). Coronavirus Disease-2019: Knowledge, Attitude, and Practices of Health Care Workers at Makerere University Teaching Hospitals, Uganda. *Frontiers in Public Health*, 0, 181. <https://doi.org/10.3389/FPUBH.2020.00181>
23. Skrip, L. A., Selvaraj, P., Hagedorn, B., Lin, A., Noori, N., Orcutt, A., Mistry, D., Bedson, J., & Laurent, H. (2021). Seeding COVID-19 across Sub-Saharan Africa : An Analysis of Reported Importation Events across 49 Countries. 104(5), 1694–1702. <https://doi.org/10.4269/ajtmh.20-1502>
24. Spinewine, A., Catherine, P., Evrard, P., Vastrade, C., Laurent, C., & Henrard, S. (2021). Attitudes towards COVID-19 Vaccination among Hospital Staff — Understanding What Matters to Hesitant People. 1–13.
25. Velasco, J. M., Tseng, W., & Chang, C. (2021). Factors Affecting the Cases and Deaths of COVID-19 Victims.
26. WHO. (2020a). Coronavirus disease 2019 (COVID-19). 2019(March).
27. WHO. (2020b). Immunization - PAHO/WHO | Pan American Health Organization. <https://www.paho.org/en/topics/immunization>
28. WHO. (2021). Impact report on an international institutional health research partnership 1 year into THE covid-19 pandemic.

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