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KNOWLEDGE, ATTITUDES, AND UPTAKE OF COVID-19 VACCINATIONS AMONG NURSES AT MBARARA REGIONAL REFERRAL HOSPITAL. A CROSS-SECTIONAL STUDY.

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ABSTRACT.

Background.

Vaccination is the most important and reliable public health measure and the most effective strategy for protecting the population from COVID-19. Much as vaccines are present, there is low uptake due to their low availability, poor attitudes, and low levels of knowledge among the population due to hesitancy.Low vaccination uptake poses the population and nurses at risk of acquiring the disease and of individuals developing complications of the same disease compared to vaccinated communities.

Methodology.

The study had a hospital-based cross-sectional descriptive design, as data were collected from participants at one point in time. Data were collected using a questionnaire administered to 138 randomly sampled nurses at the Mbarara Regional Hospital.

Results.

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

Conclusion.

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

Recommendation. The government, through the 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, such as local radio stations and health education programs at health facilities and community health outreaches.

Keywords: Covid-19 Vaccination; Attitudes; Knowledge and Nurses
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BACKGROUND.

Coronaviruses are single-stranded ribonucleic acid viruses belonging to the family Coronaviridae and coronaviruses. Coronavirus infection was previously not known to be lethal, and its etiological role was commonly reported in common colds caused mainly by human coronaviruses, such as Human Corona Virus-NL63.

However, zoonotic variants of the coronavirus, including severe acute respiratory syndrome-related coronavirus (SARS-CoV), Middle East respiratory syndrome-related coronavirus (MERS-CoV), and severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), have been implicated in the etiology of Corona Virus Disease(COVID-19) which has ravaged nations in pandemic proportions since its outbreak in the early 2020when its associated mortality was first reported to be 46.4% (Velasco et al., 2021).

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Coronaviruses contain small particles with an outer coat of protein units. Virus-like particles do not contain any genetic material; hence, they cannot cause infection and are used to produce vaccines that boost the immune system against COVID-19 infection.

In March 2020, the novel coronavirus disease was declared a global pandemic after its emergence in Wuhan, China, in November 2019, and by the 28th of March 2021, with 126,359,540 confirmed cases of COVID-19, 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) had 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 infection. The first case of infection in Sub-Sarah Africa was reported on 28th January 2020 (Adams et al., 2021) but to most high-income countries, this region has already experienced the fourth wave of the pandemic, which suggests the need to further strengthen public health control measures, including vaccination, to curtail the spread of coronavirus disease (Kamacooko et al., 2021).

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

Nurses are at the forefront of the fight against COVID-19. 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 to have the infection, and 2,500 had died of it. For example, anecdotal data from the Mbarara Regional Referral Hospital staff indicate 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 a great danger, considering the pivotal role of nurses in the well-being of society. Such high numbers of affected health workers would fuel the 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, reduce the severity of adverse symptoms, and reduce the risk of death by 90%. Despite this proven benefit, the uptake of the COVID-19 Vaccination in our setting remains low. As of May 2021, only 18.3% of the African workforce had been vaccinated against COVID–19, and of these, 89% of whom were healthcare workers in urban centers, particularly in capital cities (Cooper et al., 2021).

Study Objectives

General Objective

To assess the knowledge, attitudes, and uptake of COVID-19 vaccination among nurses at Mbarara Regional Referral Hospital staff.

Specific Objectives

1. To assess the level of knowledge about COVID-19 vaccination among nurses at Mbarara Regional Referral Hospital staff.
2. To describe the attitudes and perceived barriers to COVID-19 vaccination among nurses at Mbarara Regional Referral Hospital health workers staff.
3. To determine the uptake of COVID-19 vaccination among nurses at Mbarara Regional Referral Hospital Centre staff.

METHODS.

Study Design.

This was a descriptive hospital-based cross-sectional study. The Mbarara Regional Referral Hospital was chosen because it is a referral hospital where all covid 19 cases are managed and has the highest number of nurses.

Study Setting

The study was conducted at the Mbarara Regional Referral Hospital, which is under the Ministry of Health in Mbarara City and Kamukuzi Division. The Hospital is in western Uganda with a bed capacity of 600 and serves a population of approximately 25000 from the districts of Mbarara, Kasese, Masaka, Ntungamo, Isingiro, Kiruhura, Kazo, Ibanda, Kitagwenda, Mitooma, Lyantonde, Rakai, and neighboring countries such as Rwanda, Tanzania, and Congo.

At Mbarara Regional Referral Hospital, prospective vaccination of patients comes in through the outpatient immunization clinic, which runs five days a week. The health facility has 250 health workers, including; 180 nurses, 11 clinical officers, 15 laboratory technicians,

7 counselors, 10 medical officers, 6 medical officials grade, and 5 consultants. The Hospital started offering COVID-19 vaccination in July 2021, received about 100 to 150 Clients weekly, and has so far vaccinated a total of 13847 clients for COVID-19.

Population.

Target Population.

This study included all nurses aged 20–60 years at the Mbarara Regional Referral Hospital during the study period.

Study Population.

This included all nurses who were present during the study period.

Eligibility.

Inclusion Criteria.

The study included all nurses aged 20 years or older, who voluntarily provided written informed consent to participate in the study.

Exclusion Criteria

- Absent at the facility during the study period

Sample Size Determination

Yamane's formula (1975) was used to calculate the sample size, where **n** is the sample size, **N** is the population size, and **e** is the precision level. The hospital had an average of 210 patients, so our N=210.

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

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

n =138 participants

Sampling Procedure

compliance 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 the language they best understood, and written consent was sought. The PI then conducted the structured interviews.

Data Collection Tools.

Data was collected using a structured questionnaire which is divided into four sections.
The first section captured the participants' identifiers, such as the study ID, date of enrolment, and health cadres/job positions.
The second section captured participants' sociodemographic characteristics, such as age, gender, address, and family socioeconomic status.
The third section assessed the level of knowledge regarding COVID-19 vaccination among health workers.
The fourth section captured information on the attitudes and challenges that health workers at Mbarara Regional Referral Hospital perceived to hinder their acceptability of-19 vaccination.

Quality Control.

Before the commencement of data collection, the study tool was pretested on a few nurses at Ruhaaro Mission Hospital, and the outcomes of the pretest were reviewed to check if all questions were well understood by the respondents, and if necessary adjustments were made.
To ensure the accuracy of the outcomes, all interviews were conducted by the principal investigator and periodic reviews or filled data collection tools were conducted by the research supervisor.

Ethical Considerations.

Ethical approval was obtained from the Mbarara University Research Ethics Committee, the Uganda National Council of Science and Technology (MUST-REC:2023-812), and complied with the Declaration of Helsinki ethical guidelines about research involving human subjects. Before the 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 nurse codes were used instead 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; the computer used for data entry, storage, and analysis was also kept

password-protected; and access was granted only to the principal investigator.

It was made clear to participants that there was no monetary incentive for participation in the study, that participation was voluntary, and that the participant was free to decline participation and draw their consent at any time during the interview without reprisal.

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

Data Management.

Data were analyzed using SPSS (Statistical Package for Social Sciences, version 22.0). Participants' baseline characteristics were described using means, medians for continuous variables, and proportions for categorical variables, and are presented in a table.

The proportions of different knowledge questions that were answered correctly were calculated and presented in tables as frequencies or graphs. A stratified analysis was conducted to compare the frequency of each knowledge aspect across age, sex, health cadres, and

RESULTS.

Socio-Demographic Characteristics of Study Participants.

This study shows that participants of the age group–24-29 years were 33.3%, 30-35–were 23.2% and 20- 23 years were 18.1%. The least common were those in the age group above 50 years (8.7%). There were more females 58.7%) than males 41.3%), and the majority were Banyankore (62.3%) or Bafumbira (8.7%). Protestants in this study were 51.4% more likely than other religions, such as Catholics (33.3%), born-agains (7.2%), and SDAs (3.6%). The majority of nurses were married (n=87, 63.0%) and educated at a diploma level of 49.3%, compared to 38.4%.

Table 1: Showing Socio-Demographics of the Study Participants

Knowledge Levels about Vaccination of

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)

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Participants.

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

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

Vaccine Dosage: The majority (n=116, 84.1%) responded that only two doses of the vaccine were administered, followed by 84(60.9%) who responded that only one dose was administered, and 41(29.7%) who responded.

For vaccines used in Uganda**:** The majority reported that AstraZeneca (n=135, 97.8%), followed by Moderna (n=126, 91.3%), Johnson (n=125, 90.6%), Pfizer (n=111, 80.4%), and Covaxin (n=27, 19.6%).

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

Vaccine Protection: The majority of participants (n=121; 87.7) reported that the vaccine offered protection against COVID 19 whereas n=17(12.3%) did not.

Vaccine given as an Inactivated Virus**:** The majority of the participants (n=106, 76.8%) reported that the vaccine was given as an inactivated coronavirus, followed by those who reported that they did not know (n=29, 21.0%), and finally by those who denied (n=3, 2.2%).

Getting Infected after Vaccination: The majority of the participants (n=128, 92.8%) said that they could be infected after vaccination, whereas 10(7.2%) disagreed with this.

Vaccination with different vaccines: The majority of the participants (n=115, 83.3%) said that they could be vaccinated with a different vaccine, whereas 23(16.7%) said that they could not.

Vaccination Safety: The majority of participants (n=101, 73.2%) said that vaccination was safe, whereas 47(26.8%) said that it was not safe.

Advising another person to take the vaccine: The majority of the participants said that they could advise any other person to take the vaccine (n=116, 84.1%), whereas 22(15.2%) said that they could not.

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TABLE 2: Knowledge Levels of Vaccination of Participants

Variable	Responses	N(%)
Vaccination awareness.	No	3(2.2)
	Yes	135(97.8)
Information source	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)
Vaccine safety	safe without side effects	120(87.0)
	Not safe with obvious	15(10.9)
	side effects	3(2.2)
	Safe without side effects	
Vaccines used in Uganda	AstraZeneca	135(97.8)
	Johnson Johnson	125(90.6)
	Moderna	126(91.3)
	Covaxin	27(19.6)
	Pfizer	111(80.4)
WHO recommended	3-4 weeks	69(50.0)
time interval	5-6 weeks	60(43.5)
	1-2 weeks	9(6.5)
Offers protection	Yes	121(87.7)
	No	17(12.3)
Given via injection	Yes	133(96.4)
	No	5(3.6)
Given as inactivated	Yes	106(76.8)
virus	No	3(2.2)
	Don't known	29(21.0)
Getting infected after	Yes	128(92.8)
vaccination	No	10(7.2)
Getting vaccinated while	Yes	57(41.3)
Covid 19 positive	No	81(58.7)
Vaccinated with a	Yes	115(83.3)
differed vaccine	No	23(16.7)
Vaccine useful	Yes	118(85.5)
	No	20(14.5)
Safety	Yes	101(73.2)
	No	37(26.8)
Perceived Knowledge	side effects	20(14.5)
	trust issues	17(12.3)
	Boast immunity	50(36.2)
	Offer protection	50(36.2)
Advise another person to	Yes	116(84.1)
take it	No	22(15.9),

Uptake of COVID-19 Vaccination

The results of the uptake of COVID-19 vaccination among nurses working at Mbarara Regional Referral Hospital are presented in Table 3.

The results in Table 3 reveal that the majority of the study participants were vaccinated against COVID-19 19 n=118, 85.5%), whereas 20(14.5%) were not vaccinated against COVID-19. Most of them (n=88, 63.8%) were vaccinated with AstraZeneca, 27(19.6%) with John Johnson and n seven (5.1%) with Moderna. The highest 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%).

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TABLE 1: Showing Uptake of Covid19 Vaccination of 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)

Factors Influencing COVID-19 Vaccination.

Below are some of the factors that were highlighted by the participants when they had to choose all the factors that contributed to their decision to either vaccinate or not vaccinate against COVID-19. Table 4 presents the results.
The results above revealed that;

Facilitators; For the uptake of vaccination, desire to protect oneself n=112(81.2%) followed by desire to protect friends and family (n=98, 71.0), travel purpose (n=65, 47.1), and compulsory workplace n=64(46.4).
Barriers; The results revealed that barriers included people concerned about the side effects (n=18, 13.0), concern about the safety of the vaccine (n=14, 10.1), followed by a plan to wait and take it later, n=12(8.7); and lastly, myths and conspiracy about the vaccine n=7(5.1).

TABLE 4: FACTORS INFLUENCING COVID-19 VACCINATION

Variable	Response	N (%)
Facilitators	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)
Barriers	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)

DISCUSSION.

Curbing the effects of COVID-19 among Nurses and the general population requires good awareness (good knowledge), attitude, and adequate utilization of COVID-19 vaccines to reduce COVID-19 spread and mortality rates (WHO,2021). This study investigated the Knowledge, Attitudes, and Uptake of COVID-19 vaccinations among nurses at the Mbarara Regional Referral Hospital in southwestern Uganda.
The findings of this survey suggest knowledge about COVID-19 vaccination among nurses was high (97.8%) compared to studies conducted in Iran and Hong Kong, which found that nurses' knowledge ranged from 35-45.4%(Elhadi et al., 2021; I det, Hassan et al., 2021). The reasons for good knowledge among these nurses could be attributed to the fact that Uganda was one of the luckiest countries that received COVID-19 vaccination early, so health workers had sufficient training and orientation about the virus; thus, they had good knowledge of prevention and vaccination, unlike in Asian countries where COVID 19 started and most health workers were not fully oriented about the disease; thus, their knowledge about COVID vaccination was found to be low in earlier studies conducted among them.

Knowledge and Attitudes of Nurses towards Covid Vaccination.

Having good knowledge and attitudes towards vaccination is key to the utilization of Covid Vaccination among nurses (Esimone *et al*., 2021).
While vaccines are known to be successful public health measures, an increasing number of nurses believe that vaccines are neither safe nor necessary because of poor knowledge and attitudes towards vaccination (Ciardi, Kumar, et al.,2021). Therefore, this study assessed nurses' knowledge attitudes, and uptake of the Covid Vaccine among nurses.

Levels of Awareness about COVID-19Vaccination

In this study, the majority of the participants had good knowledge of the following questions: COVID-19 stimulates immunity, vaccination provides protection, provides protection to others, COVID -19 vaccine is via injection, COVID-19 vaccines use inactivated coronavirus, vaccine is safe with some side effects, Ever heard of COVID-19 vaccination, Can be infected after vaccination).
Participants who said yes to "vaccination protection for a lifetime" were considered to know and those who said NO to, "Can one be vaccinated while suffering from COVID-19" were considered to have good knowledge.
A study conducted in Iran reported that 38% of nurses had a fear of vaccine side effects (Elhadi et al., 2021). Some would delay their vaccination to observe what happens to those who get vaccinated first, while others believe that since they did not possess comorbidities, they had less risk and did not need to get vaccinated, while others reported that the vaccine would worsen their living due to vaccination-related illness, some believed the disease was not dangerous, and that they had a natural resistance to help them fight the infection(I det, Hassan et al., 2021).

In this study, the majority of participants were aware of COVID-19 vaccination. These results are higher than those of a study on knowledge, attitude, and practice towards COVID-19 vaccination acceptance in West India, where only a few of the respondents were aware of the COVID-19 vaccine, with rest believing that it did not exist, or they did not know about Covid Vaccination (Kumar *et al*., 2021). This was because the COVID-19 Vaccination program was launched and started among health workers.
This study showed that most sources of information about COVID-19 vaccination included official news media, which is higher than a similar study conducted in Bangladesh on Knowledge, attitudes, and perceptions towards COVID-19 vaccination, where social media was the source reported by a significant number of respondents (Islam *et al*., 2021). These results were because these nurses have access to the hospital's Internet, so they are always updated.
Another study conducted in Iran found that the most common source of information was the media, which is consistent with my findings (Hassen et al., 2021). This is because the government emphasized sensitization in all media, and thus, all people could access information easily, which increased their knowledge and awareness.
In this study, the majority believed that the vaccine was safe with some side effects. These results were similar to Ahlam et al.'s study conducted on knowledge, attitudes, and practices towards the COVID-19 Vaccine in Oman (Ahlam e*t al*., 2021). This is because the vaccine itself offers protection to the body and, at the same time, has side effects, such as headache, dizziness, and fever.
This was reported in another study conducted in Hong Kong, which found that 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 and reported that vaccination against pneumonia and the use of certain antibiotics can protect them against COVID-19 infection. This could have contributed to the low vaccination uptake observed in this study (Ciardi *et al*., 2021).
Although vaccines are known to be successful public health measures, an increasing number of people believe that they 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 nurses are afraid of the COVID-19 vaccine because they doubt its quality and safety owing to its expedited development and approval. A study conducted in the United Kingdom reported fear of COVID-19 vaccination resulting in actual COVID-19 infection among nurses, health professionals, and support staff as a reason for vaccine hesitancy (Hassen et al., 2021).

Attitudes of Nurses towards COVID-19 Vaccination.

In this study, participants were considered to have a positive attitude if they thought that the COVID-19 vaccine was useful, those who thought that it was safe to vaccinate, and those who thought that vaccination was not useful or safe were considered to have a negative attitude.
The majority of the study participants were willing to take up any approved vaccine, which is slightly higher than the study done on Knowledge, Attitudes, and Perceptions of COVID-19 Vaccination among nurses of an Inner-City Hospital in New York, where respondents were willing to be vaccinated within 30

days, and a few respondents were willing after six months. (Ciardi *et al.*, 2021).
This is because most nurses gained trust in the Ministry of Health.
Very few of the participants were unwilling to take up vaccination, which is lower than the acceptance of the coronavirus disease -2019. This is in line with Kanyike's study findings where Vaccines among medical students in Uganda, the majority of the participants were unwilling to be vaccinated against COVID-19 (Kanyike et al., 2021). This may be attributed to the common side effects experienced by those who have previously been vaccinated.
The majority of the study participants would recommend family members and friends to vaccinate, which is better than that in Oman regarding Knowledge, Attitudes, and Practices (KAP) toward the COVID-19 vaccine which is slightly lower (Ahlam *et al*., 2021), and higher than that in Bangladesh on Knowledge, attitudes, and perceptions towards COVID-19 vaccinations.

Uptake of COVID-19 Vaccination.

The AstraZeneca is the most commonly used vaccine reported in this study. This was followed by the work of Johnson and Johnson. This is because AstraZeneca was the first vaccine introduced in Uganda. The findings of this study were consistent with those of a Canadian University study, in which the majority of participants had received the AstraZeneca vaccine (Madalein et al., 2021).
Moderna was the least-used vaccine reported in this study. This is because it was introduced last, when most health workers had been vaccinated and was restricted to children only because it had fewer side effects.
Most participants in this study received two doses of the vaccine. This was because most had received a dose of AstraZeneca that required only two doses, and most health workers reported why they received two doses, which was convenient and safe. These findings are consistent with those of a study conducted in Hong Kong, where most participants received two doses of AstraZeneca (Cooper et al., 2021). However,
a study conducted in South Africa on knowledge and uptake of COVID-19 vaccination found that most participants had only taken one dose of the vaccine. This is because most participants had a negative attitude towards COVID-19 vaccination (Suhlen et al.,2020).

CONCLUSION.

Despite government efforts to provide mass vaccination to nurses, the uptake of COVID-19 vaccines among nurses remains suboptimal. In addition, this study suggests that the factors that influence the uptake of COVID-19 Vaccination among nurses are poor knowledge, bad attitudes, and lack of awareness about COVID-19 vaccines.

STUDY LIMITATIONS.

- The findings were not generalizable to all nurses in Uganda because of the small sample size of this study.
- This study focused on the perceived challenges that hindered the acceptance of the COVID-19 vaccination; therefore, some information was hidden by nurses.
- A statistical analysis of the factors associated with acceptance allowed for a more accurate causal inference for poor vaccination uptake in the setting.
- There was limited time to collect data, and it was difficult to obtain health workers who were not on duty because of their busy schedule of work.

RECOMMENDATIONS.

Policy

The government, through the 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, such as local radio stations and health education programs at health facilities and community health outreaches.
The government should also expand its mass COVID-19 immunization campaign to include the local areas. Immunization services should also be incorporated into the healthcare packages provided as part of outpatient services in government health facilities.
If mass vaccination is to successfully work with nurses. The government also needs to continuously sensitize and advocate for vaccination among nurses because they are front-liners and role models for the public, and they are front-liners in handling this pandemic. Finally, and perhaps most importantly, nurses must increase their understanding and address vaccine hesitancy. This is crucial for successful implementation. Developing tailored strategies, such as Continuous Medical Education (CMEs), to address the concerns identified in the study to decrease vaccine hesitancy will be the key to success.

RESEARCH.

Future studies should assess the factors affecting the knowledge and attitude of the entire population regarding the COVID-19 vaccination.

HEALTH CARE PRACTICE.

This will help to improve nurses' attitudes and perceptions towards COVID-19 Vaccination since they will gain more knowledge on vaccination and avoid myths and beliefs about vaccination.

STRENGTHS OF THE STUDY.

The participants had equal chances of participation; hence, there was no bias in the information. The sampled participants are representative of the entire study population. Quantitative research methods were employed, and data were 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, as most of the participants were adults and always received highly informed information from social media.

AUTHOR CONTRIBUTION

All the authors made a significant contribution to this work. From the conception of the research topic to the study design, execution, and acquisition of data, analysis, and interpretation. We participated in drafting, revising, and critically reviewing the article. We also jointly agree on the version to be published and on the journal in which the article should be submitted for publication. We also agree to be jointly accountable for all aspects of this work.

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CONSENT FOR PUBLICATION

The participants provided consent for the data to be used for research purposes. They were also assured that any information about them would be anonymized.

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ORIGINAL RESEARCH

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