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## COVID-19 Vaccination: Prevalence and Associated Factors among Students and Staff (A Case of Islamic University in Uganda)

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### ABSTRACT

**Background:** COVID-19 Vaccination is an important control measure for the spread of covid -19 with in Academic Institutions. This study aimed to investigated the Prevalence of COVID-19 Vaccination and associated factors among University Students and staff.

**Subjects and Method:** This was a cross-sectional study conducted at Islamic University, Uganda, from July to October 2021. A number of 397 students and staff of IUIU were selected purposively. The dependent variable was vaccination status. The independent variables were age, gender, education status, source of income, religion, marital status, nationality risk perception. Data were collected using an online google form sent via emails WhatsApp and ERP and analyze using Chi-square.

**Results:** There were 397 participants, the modal age was 16-25 years 233 (58.7%) were male, the prevalence of COVID-19 Vaccination was 20.4 % (81). Factors such as age (OR= 0.59; 95% CI= 0.25 to 1.37; p<0.001), Gender (OR= 0.59; 95% CI= 1.06 to 3.00; p=0.026), marital status (OR= 1.55; 95% CI= 0.20 to 0.56; p<0.001) were associated with uptake of COVID-19 vaccination.

**Conclusion:** The Study found a low Prevalence of COVID-19 Vaccination (20.4%) among students and staff at IUIU, and a number of factors presented above were responsible for this. More Education and sensitization on the importance of Vaccination is still needed. A follow up study on the same should be done after full opening of academic institutions.

**Keywords:** prevalence, COVID-19, vaccination, factor, student and staff, Uganda

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### BACKGROUND

On December 32, 2019, the China Health Authority alerted the World Health Organization (WHO) about several cases of pneumonia like illness of unknown an etiology in Wuhan city in Hubei Province in Central China (Johnson, 2019). This Respiratory ill-

ness was later found to be caused by a Novel Corona Virus disease also known as Severe acute Respiratory syndrome Corona Virus-2 (SARS-CoV-2) or Corona Virus Disease 2019 (COVID-19) (Rashid et al, 2019). Which was later declared a global pandemic by the World Health Organizati-

on (WHO) on 11th March 2020 (WHO, 2020). The disease is characterized by symptoms like flu, dry cough, shortness of breath, difficulty in breathing plus fever, headache, joint pains, chest pains loss of smell and taste sensation. The virus can be spread from an infected person's mouth or nose when he or she sneezes, coughs, sings or breathes (WHO, 2021). The disease can be controlled by keeping a social distance by avoiding crowded places, frequent hand washing with soap and water, Sanitizing, cough etiquettes and wearing of facial masks as well as vaccination (WHO, 2019).

As of 11th October 2021, there were 237 million confirmed COVID-19 Cases globally with about 4.8 Million deaths (Johnson, 2019). Uganda has registered 124,736 COVID-19 cases and 3,177 deaths as of 11th October 2021 (WHO, 2019). Vaccination has been declared as most effective way of controlling the spread of COVID-19 disease to enable countries go back to their normal ways of operation. As of 8th October 2021, a total of 7 vaccines have been approved by WHO for emergency use in different parts of the world these include: Moderna, Pfizer, Johnson and Johnson Astra Zeneca, Vero-cells, Sinovac and Covishield (WHO, 2021). Vaccines work by producing antibodies in your body which help in fighting off the infection when you're exposed to the virus (Rashid and Swaibu, 2021).

Thus getting vaccinated can help to prevent the spread of the infection, protect the unborn and the new born baby, and would enable communities to reconnect with families and friends including but not limited to full re opening of academic institutions and the whole economy at large (MoH, 2021).

The Uganda's Ministry of Health (MoH) Rolled out the COVID-19 vaccination on 10th March 2021 targeting about 22 million people in a phased manner. The first

phase targeted Health workers, security officers, the elderly, people with underlying chronic diseases teachers and students among others (MoH, 2021). This was intended to have a bigger percentage of the population vaccinated which would lead to acquisition of herd immunity within the community and hence total lifting of the COVID-19 control measures like re opening of schools or academic institutions and the whole economy at large.

Despite many groups including Front-line Health workers being at a higher risk of contracting the disease (Biswas et al., 2021). A study done by Yanqui Yu and others among Health workers in Hong Kong China showed a lower prevalence COVID-19 vaccination at 21% (Yu et al., 2021).

Studies have further shown that the willingness to vaccinate was higher in low- and mid-income countries compared to developed countries like Russia and USA. Concerns of Vaccine Safety, Efficacy, fear of side effects, having chronic diseases, old age and being male were found to be the main reasons for COVID -19 Vaccine Hesitancy and refusal to Vaccinate or take up the COVID-19 vaccine (Biswas et al., 2021; Yu et al., 2021)

In another study it was discovered that COVID-19 vaccination acceptance was low and to enhance the uptake the government involved many stakeholders in educating the public and use of mass media (Mesele, 2021). Yet it was also established that for the public to take on vaccination they weighed the risk factors, geography and occupation risk involved and it was argued that the masses to continue masking, physical distance and frequency in hand washing as measures to stop the spread of COVID-19 (McAlister et al., 2021). White-man and others argued that monitoring of demographic and social factors affecting COVID-19 vaccines access is critical putting

the old ones first in receiving COVID-19 vaccine (Whiteman et al., 2020).

Olveira and others discovered that the hesitancy is associated with contextual, individual, and clinical factors (de Oliveira et al., 2021). Whereas Robertson and others established that hesitancy is high but varies among the various ethnic groups (Pakistanis and Bangladeshi) although there was willingness among across the United Kingdom community (Robertson, 2021).

Studies have further shown that the main reasons for willingness to vaccinate includes personal protection against COVID-19, and being advised or encouraged by health workers (Arce et al., 2021) where as in another study done among students in Canada showed that about 77% of them were willing to get vaccinated and the factors included among others increased perception of the severity of COVID-19 (Mant et al., 2021).

There is no single study that has been done to determine the prevalence of COVID 19 vaccination among University Students and staff in Uganda. In this Current study therefore, we assessed the prevalence of COVID-19 Vaccination status of IUIU Students and staff and its associated factors.

## SUBJECTS AND METHOD

### 1. Study Design

This was a cross sectional study at Islamic University, Uganda, from July to October 2021.

### 2. Population and Sample

The study Population included students and staff currently enrolled at all the four campuses of Islamic University in Uganda, from July to October 2021. Sampling was carried out using purposive sampling technique. The subjects used were 397.

### 3. Study Variables

The dependent variable was vaccination status, the independent variables were age

category, sex, education status, source of income, religion, marital status, nationality risk perception.

### 4. Operational Definition of Variables

**Vaccination status** is all those who will have received one or two doses were considered as vaccinated and those with zero doses were regarded as not vaccinated.

**Age category** is all University Students aged and staff aged 18 years and above were eligible to participate in the study.

**Gender** was categorized into male or female.

**Education status** are categorized as None for those who have never attended school, then primary, secondary and tertiary for those who have attained post-secondary education level.

**Source of income** included the different occupations that participants get their income from.

**Religion** is referred to Participant's beliefs and faith.

**Marital status** included whether someone is married, single divorced or any other as per the participants wish.

**Nationality** was included the participants place of origin and citizenship.

### 5. Instruments

The data is in the form of primary data and secondary data.

Primary data were obtained using on-line questionnaire filled out by research subjects. Secondary data were obtained from the Islamic University, Uganda in the form of students and staff of IUIU in Islamic University, Uganda. The instruments used was a structured questionnaire.

### 6. Data Analysis

Univariate analysis was carried out to see frequencies and proportions with the use statements, tables and figures to determine the Prevalence of COVID-19 vaccination. While bivariate analysis was performed using the chi-square test of association ana-

lysis of prevalence of COVID -9 vaccination and associated factors among university students and staff.

## RESULTS

### 1. Univariate Analysis

The univariate analysis was carried out to see the frequency distribution of the socio demographic study subjects.

**Table 1. Social demographic of the study subjects**

Variables	Category	Frequency (n)	Percentage (%)
<b>Gender</b>	Female	170	42.8
	Male	225	56.7
	Prefer not to say	2	0.5
<b>Age</b>	16-25 years	233	58.7
	26-35 years	103	25.9
	36-45 years	41	10.3
	46-55 years	15	3.8
	Above 55 years	5	1.3
<b>Religion</b>	Born again (Pentecostal)	25	6.3
	Catholic	46	11.6
	Muslim	276	69.5
	Protestant (Anglican)	43	10.8
	Seventh day Adventist	3	0.8
	Others	4	1.0
	<b>Marital Status</b>	Divorced	4
	Married	126	31.7
	Single	267	67.3
<b>Responsibility Held</b>	Staff	86	21.7
<b>Type of Staff</b>	Student	311	78.3
	Non-Teaching Staff	39	45.3
	Teaching Staff	47	54.7

Table 1 showed there were 397 subjects' majority of whom (56.7%) were males and (42.8%) were female. A bigger proportion (58.7%) were aged between 16-25 years, followed by 25.9% aged 26-35 years, and the least proportion (1.3%) of the participants were age above 55 years. Majority of the participants (69.5%) were Muslims, followed by 11.6% Catholics, then 10.8% Protestants (Anglican), and the least 0.8% Seventh day Adventists. A bigger percentage (67.3%) of the respondents were single, 31.7% were married and 1.0% of the respon-

dents were divorced. Majority of the respondents (78.3%) were students and only 21.7% were staff members. (54.7%) of the staff were teaching staff and the rest (45.3%) were non-teaching staff.

Table 2 showed that the majority of the respondents (79.6%) had not received a single dose of COVID-19 vaccine. However, 14.6% of the respondents had received one dose and only (5.8%) of the respondents had received two doses of COVID-19 Vaccine.

**Table 2. Prevalence of COVID-19 Vaccination.**

Category	Frequency (n)	Percentage (%)
Those who have Not received any dose of COVID-19 Vaccine.	316	79.6
Those Who have received one dose of COVID-19 Vaccine	58	14.6
Those who have received two doses of COVID-19 Vaccine	23	5.8
<b>Total</b>	<b>397</b>	<b>100.0</b>

**Table 3. Awareness of the respondents on COVID-19 vaccination.**

Variables	Responses	Frequency (n)	Percentage (%)
<b>I believe the COVID-19 vaccine is a very effective vaccine</b>	Strongly Agree	53	13.4
	Agree	82	20.7
	Neutral	166	41.8
	Disagree	56	14.1
	Strongly Disagree	30	7.6
<b>Covid-19 vaccine contains harmful substance which can be harmful to our body</b>	Strongly Agree	49	12.3
	Agree	60	15.1
	Neutral	190	47.9
<b>Preference to receive COVID-19 vaccination if given an opportunity</b>	Disagree	74	18.6
	Strongly Disagree	24	6.0
	I am not sure about my preference	104	26.2
	I prefer not to receive the vaccine	98	24.7
	I would prefer to receive the vaccine	195	49.1
<b>Main sources of information regarding COVID-19 vaccination</b>	Friends, family, relatives and peers	27	6.8
	Health workers	95	23.9
	Political leaders	7	1.8
	Religious, cultural, and other opinion leaders	3	0.8
	Social media (Facebook, Watsaapp, Twitter)	174	43.8
	TV/Radio	91	22.9
<b>As an individual, I have received adequate information about COVID-19 vaccine that can enable me make an informed decision</b>	Strongly Agree	132	33.2
	Agree	160	40.3
	Undecided	59	14.9
	Disagree	37	9.3
	Strongly Disagree	9	2.3

Table 3 showed the issue of effectiveness of COVID-19 vaccine, 34.1% of the subjects agreed that the COVID-19 vaccine is a very effective vaccine, 21.7% of the respondents disagreed. However, most of the subjects

(41.8%) were not sure about the effectiveness of the COVID-19 vaccine.

Similarly, the results indicate that 27.4% of the respondents agreed that COVID-19 vaccine contains harmful substances which can be harmful to our body,

24.6% of the respondents disagreed, and most of the respondents (47.9%) were not sure. The results also show that most of the subjects (49.1%) would prefer to receive the vaccine, 24.7% Preferred not receive the vaccine, and 26.2% were not sure about their preference. In relation to the main sources of information regarding COVID-19 vaccination, most of the subjects (43.8%) identified social media (Facebook, WhatsApp, Twitter) as the main source of infor-

mation, 23.9% of the respondents reported health workers as the main source, and the least (0.8%) of the subjects reported to have received information from religious, cultural, and other Opinion leaders.

The study also indicates that majority (73.5%) of the subjects agreed to have received adequate information about COVID-19 vaccine that can enable them make an informed decision while only a few (11.6%) of the subjects disagreed.

**Table 4. Hesitancy of COVID-19 vaccination among the respondents**

Variables	Responses	n	%
<b>Reasons for not being vaccinated for Covid-19 (category 1)</b>	I don't have access to the vaccine	2	0.7
	I don't have time am always busy	32	10.6
	I don't trust the source of the vaccine	129	43.0
	I fear the side effects of the vaccine	121	40.3
	I fear to be injected because of pain	14	4.7
<b>Reasons for not being vaccinated for Covid-19 (category 2)</b>	I have no reason	2	0.7
	I am not among the essential workers	64	25.2
	I have no time to go for vaccination	40	15.7
	I don't need the vaccine because I observe the SOPs	132	52.0
	The vaccine is only for health workers and am not among them	18	7.1
<b>Reasons for not being vaccinated for Covid-19 (category 3)</b>	I can treat myself with herbs (local medication) and it's enough for me	70	51.1
	I cannot be infected by COVID-19	10	7.3
	I have a very strong immunity	53	38.7
	My religion does not allow me to be vaccinated	4	2.9
<b>Preferred control measures of Covid-19</b>	Frequent hand washing	34	8.6
	Keeping social distance	59	14.9
	Using face mask	150	37.8
	Vaccination	147	37.0
	I don't know	7	1.8

Table 4 showed the reasons for not being vaccinated for COVID-19, the findings revealed that most of the subjects (43.0%) don't trust the source of the vaccine, 40.3% of the subjects fear the side effects of the vaccine, and 10.6% of the subjects don't have time since they are always busy. Similarly, the study indicated that majority of the subjects (52.0%) argued that they did not need the vaccine because the observe the SOPs and 25.2% argued

that they were not among the essential workers.

Furthermore, the study also revealed that majority of the respondents (51.1%) argued that they can treat themselves with herbs (local medication) which is enough for them, 38.7% of the respondents argued that they have a very strong immunity, and some (7.3%) of the respondents argued that they cannot be infected by COVID-19.

Considering the respondent's preference on the infection prevention and control measures and (37.8%) of the subjects preferred using a face mask followed by (37.8%) of the respondents who preferred vaccination, and then a few respondents (8.6%) preferred frequent hand washing as a control measure of COVID-19.

## 2. Bivariate Analysis

Bivariate analysis of the social demographic factors associated with COVID-19 vaccination among subjects revealed that male were approximately 2 times to be vac-

nated than the female counter parts (OR= 1.79; 95% CI= 1.06 to 3.00; p= 0.026). the age of subjects was also associated with the prevalence of vaccination among the subjects (OR= 0.59; 95% CI= 0.25 to 1.37; p<0.001). It further revealed that those who are single and students were less interested in getting vaccinated compared to those who are married and staff (OR= 0.34; 95% CI= 0.20 to 0.56; p<0.001) and subject's status being staff or students (OR= 0.46; 95% CI= 0.27 to 0.80; p= 0.005) respectively.

**Table 4. Factors Associated with COVID-19 vaccination among the study subjects**

Variables	Not Vaccinated		vaccinated		OR	95% CI		p
	n	%	n	%		Lower Limit	Upper Limit	
<b>Religion</b>								
Catholic	34	73.9	12	26.1	1			0.399
Muslim	216	79.1	57	20.9	0.74	0.07	1.18	0.429
Protestant (Anglican)	34	79.1	9	20.9	0.75	0.28	2.01	0.0568
Others	28	90.3	3	9.7	0.30	0.07	1.18	0.086
<b>Age category</b>								
16-25	201	87.8	28	12.2	1			<0.001
26-35	76	73.8	27	26.2	0.23	0.10	0.52	<0.001
36-44	15	51.7	14	48.3	0.59	0.25	1.37	0.221
Above 45	20	79.4	12	37.5	1.55	0.56	4.31	0.396
<b>Gender</b>								
Female	143	84.6	26	15.4	1.00			
Male	169	75.4	55	24.6	0.59	1.06	3.00	0.026
<b>Marital status</b>								
Married	87	66.9	43	33.1	1.00			
Single	225	85.6	38	14.4	155	0.20	0.56	<0.001
<b>Student/staff</b>								
Staff	59	68.6	27	31.4	1.00			
Student	253	82.4	54	17.6	0.46	0.27	0.82	0.005

## DISCUSSION

The findings indicate a 20.4 % prevalence of COVID-19 vaccination among students and staff of Islamic University in Uganda. This implies that the rate and prevalence of vaccination was still low and poor among students and staff. The findings were in agreement with another study in Hongkong

China where a vaccination prevalence of 21% was reported by Yu et al, (2021). But the findings were different from another study done in Czech University students who reported 73.3% vaccine acceptance (Riad et al, 2022).

Similarly, the results indicate that 27.4% of the respondents agreed that CO-

COVID-19 vaccine contains harmful substances which can be harmful to our body, 24.6% of the respondents disagreed, and most of the respondents (47.9%) were not sure. This implies that there exists a lot of misperceptions and misconceptions about the effectiveness and harmfulness of the COVID-19 vaccine. The results also show that most of the respondents (49.1%) would prefer to receive the vaccine, 24.7% preferred not to receive the vaccine, and 26.2% were not sure about their preference. This implies there is good perception about COVID-19 vaccination in that students and staff are willing to receive the vaccine. The findings were consistent with another National survey in the United States of America (USA) where 52% of the respondents were most likely to accept vaccination and 15% not likely (Biswas et al, 2021, Khubchandani et al, 2021).

These findings were consistent with another study done in Mbale District that indicated TVs, Radios and social media as the main sources of information for COVID-19 (Rashid et al, 2019). Therefore, use of social media to pass on accurate information concerning both COVID-19 disease and Vaccination can be an effective way of sensitizing the Masses. The study also indicates that majority (73.5%) of the respondents agreed to have received adequate information about COVID-19 vaccine that can enable them make an informed decision while only a few (11.6%) of the respondents disagreed.

This implies that students and staff at IUIU are well informed about COVID-19 vaccine. Similarly, the study indicated that majority of the respondents (52.0%) argued that they did not need the vaccine because they observe the SOPs and 25.2% argued that they were not among the essential workers. Further, the study also revealed that majority of the respondents (51.1%) argued

that they can treat themselves with herbs (local medication) which is enough for them, 38.7% of the respondents argued that they have a very strong immunity, and some (7.3%) of the respondents argued that they cannot be infected by COVID-19.

These findings were somehow similar to those in the worldwide survey among health worker that indicated concerns of vaccine safety, Efficacy and side effects as the main reasons for Vaccine hesitancy (Biswas et al, 2021). Similarly the findings were in agreement with those in Hong Kong China that also high lightened Perceived low efficacy, Fear of side effects and having chronic disease status as main factors for not Vaccinating (Yu et al, (2021)). This implies that a number of reasons exist which hinder students and staff from being vaccinated for COVID-19. The Use of all available infection prevention and control Measures should be re-emphasized as opposed to choosing only few to achieve full control.

Factors such as age of respondents, Gender of respondents, marital status of the respondents and respondent status being staff or students were associated with uptake of COVID-19 vaccination among the study respondents. This was consistent with the findings of a worldwide study among health workers that found being male, old age and being a doctor more likely to be influenced their vaccination uptakes (Biswas et al, 2021). It further revealed that those who are single and students were less interested in getting vaccinated compared to those who are married and being staff respectively.

The Study found a low prevalence of COVID 19 Vaccination (20.4%) among students and staff at the University and a number of factors presented above were responsible for this. It should be noted that despite the fact that students and teachers

were among the critical categories of people to receive the Vaccines, the study was carried out when academic institutions were still under the lockdown (still closed). This may have also affected the willingness to vaccinate. Therefore, a follow up study of the vaccination status should be done following full re opening of universities and other academic institution. The study further revealed that a number of factors responsible for the low prevalence of COVID - 19 Vaccination ranging from fear of side effects, perceived low efficacy of the Vaccines, while others opting for alternative methods of infection prevention and control. There's therefore need to re-emphasize the sensitization campaigns of our communities on COVID-19 Vaccination.

#### AUTHOR CONTRIBUTION

All authors contributed meaningfully.

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This study is self-funded.

#### CONFLICT OF INTEREST

There is no conflict of interest in this study.

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