Prevalence of the uptake of Covid-19 vaccines: A cross-sectional study among the students of Bishop Stuart University in South-western Uganda.

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Abstract

Background:

Different studies have been carried out on acceptance of Covid-19 vaccines, willingness to be vaccinated against Covid-19, and factors associated with the uptake of Covid-19 vaccines but very few studies have been carried out to find out the prevalence of the uptake of Covid-19 vaccines, especially among university students. The aim of this study, therefore, is to find out the prevalence of the uptake of Covid-19 vaccines among the students of Bishop Stuart University.

Methodology:

A cross-sectional study design using qualitative and quantitative approaches were employed. Data was collected from a sample of randomly selected 370 respondents between 11th July and 3rd October 2022 from Bishop Stuart University. Qualitative and Quantitative data collection methods were employed. Statistical Package for Social Sciences version 26 was used during the analysis.

Results:

The prevalence of uptake of Covid-19 Vaccines among the students of BSU was 57.0% where the majority of the respondents were females, 52.2% (n=193), students aged ≤30 years, 59.2% (n=215), those from middle-income, 57.3% (n=212), Christians, 60.8% (n = 225) and undergraduates, 89.2% (n = 330).

Conclusion:

More than half of the students of Bishop Stuart University were vaccinated with at least one of the vaccines against COVID-19 vaccine; the general uptake of Covid-19 vaccines among these students with a full dose was low as shown by the results of those who took a full dose of AstraZeneca, Johnson & Johnson or any other Covid-19 vaccine.

Recommendation:

The study recommended that effective sensitization and psycho-education should be carried out to educate the general public about the effectiveness of the uptake of Covid-19 vaccines.

Keywords: Covid-19, vaccines, prevalence, uptake, students, Bishop Stuart University, Submitted: 17th/12/2022 Accepted: 22nd/12/2022

1. Background of the study

Covid-19 vaccines limit the risk of developing severe or even fatal symptoms of the COVID-19 disease by priming the immunological system for producing antibodies without causing sickness (Haynes et al., 2020).

The temporary measures put in place, (standard operating procedures) were necessary to stop the spread of Covid-19 but to be able to attain herd immunity, the general public should have 70% of its population vaccinated against Covid-19 with Covid-19 vaccines which were the most efficient measure of controlling Covid-19 pandemic (Sadaqa et al., 2021). However, it would be difficult to eradicate Covid-19 in the population if individuals continue to resist Covid-19 vaccines intended to provide acquired immunity despite the availability of Covid-19 vaccines.

Globally, mass COVID-19 vaccination campaigns were launched, but the translation from vaccination intention to actual vaccine uptake by the public remained unknown, hindering the evaluation of present promotion strategies (Wang et al., 2022).

In France, Tavolacci et al., (2021) carried out a study on COVID-19 Vaccine Acceptance, Hesitancy, and Resistance among University Students. The findings showed that 58.0% of students would choose to have the vaccination, 17.0% would not and 25.0% were not sure. This indicated that however much the highest number of students would choose to be vaccinated; many other students would slow down the vaccination process.

In Sub-Saharan Africa, acceptance rates of the uptake of Covid-19 vaccines were generally high, with at least four in five people willing to be vaccinated in all but one country. Vaccine acceptance ranges from nearly universal in Ethiopia (97.9 percent) to below what would likely be required for herd immunity in Mali (64.5 percent) (Kanyanda, et al., 2021).

Uganda had the number of COVID-19 vaccination doses administered per 100 people in Uganda rose to 37 as of March 19, 2022 (WHO, 2022). This number was still very low compared to the 70% requirement for the vaccinated individuals that should be vaccinated if the population was to have heard immunity to fight Covid-19 in the population.

Uganda was far from reaching its 70% vaccination target but the Accelerated Mass Vaccination Campaigns would help the general public to achieve the required coverage of 70% by April 2022 (WHO, 2022). Though the Covid-19 cases had reduced, Ugandans, especially University students, were supposed to take this campaign seriously because it's a vaccination that would help to bring Covid-19 cases down. But most students seemed to have not picked interest in this campaign which led the researcher to wonder why this was so and decided to dig deep into the factors associated with the uptake of Covid-19 vaccines among University students.

Despite the studies carried out on the prevalence of the uptake of Covid-19 vaccines among University students, a study of this sort had never been done in Mbarara City, especially among the students of Bishop Stuart University. It was against this background that the study sought to find out the Prevalence of the Uptake of COVID-19 vaccines among the Students of Bishop Stuart University, Mbarara City.

2. Methodology

The methods described here are similar to those described by (Ngabirano *et al.,* 2022).

2.1. Research design

Oso and Onen (2008) defined a research design as a plan for conducting a study. This study was conducted through a cross-sectional research design. According to Setia (2016), cross-sectional survey design is a type of observational study design where the researcher measures the outcome and the exposures in the study participants at the same time, and the participants are selected based on the inclusion and exclusion criteria set for the study. Qualitative and quantitative approaches were employed for this study. The quantitative

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data was collected using an open and closed-ended questionnaire. Qualitative data was collected using interview schedules and focus group discussions.

2.2. Area of the study

The study was carried out at Bishop Stuart University between 11th July and 3rd October 2022. Bishop Stuart University is located 5 km East of Mbarara City, in Western Uganda, East Africa on Plot 150, Buremba Road, Kashari Block 4 Kakoba Hill.

2.3. Study Population

According to Best and Kahn (2006), a study population is any group of individuals, that have one or more characteristics in common and which are of interest to the researcher. The study population encompassed all the students of Bishop Stuart University from both campuses taking into account that the students were 5000 and above at the time of the study.

Inclusion criteria**:** The students aged 18 and above were recruited for this study. These were students of Bishop Stuart University who were currently pursuing a course in any of the faculties.

Exclusion criteria**:** Students below the age of 18, those who had finished at Bishop Stuart, students from other universities, and the staff of Bishop Stuart were not recruited for this study.

2.4. Sampling strategies

This study employed both simple random sampling and snowball sampling. Simple random sampling is where each member in the target population has an equal probability of being chosen to mean that the sample is chosen without bias. The Snowball sampling technique is used in non-probability samples where the research participants already enrolled in the study help to recruit future participants. This means that the researcher was helped by the participants to know the class coordinators who were targeted to be interviewed in this study. Simple random sampling was mainly used to select a random sample whereas snowball sampling was majorly used to collect focused information.

In this study, simple random sampling was used to get students who responded to the questionnaires, and a snowball sampling strategy was used in the selection of students' coordinators to participate in the study. A simple random sampling technique was preferred for this study because the researcher aimed at ensuring that each student at Bishop Stuart University has an equal chance of being included in the study to avoid biases. The Snowball sampling technique was preferred in this study because the researcher wanted to get quality information from the selected students' coordinators without bias.

2.5. Sample size selection

The sample for this study will be determined using Slovin's formula as cited by Yamane (1967) which is

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

$$n = \frac{5000}{1 + 5000\,(0.05)^2}$$

= 370 students

n = Sample size

N= population size

e= co-efficiency level of precision (0.05)

n=370 students

The sample, therefore, consisted of 370 students of Bishop Stuart University.

Of this sample, 10 class coordinators were involved in the study in focus group discussions as shown in Table 1 above. 360 students were chosen to participate in the quantitative study because they could provide the required information on the social-cultural, social-economic and religious factors associated with the uptake of Covid-19 vaccines using the structured questions. These were the source of information as they had their own Covid-19 vaccine experiences unknown to the researcher. The 10 class coordinators were included in the study because they interact with these students daily and could bring out some information that would otherwise not have been given by the students they coordinate.

Table 1: Showing Sample size methodological matrix

Population	**Sample size**	**Sampling technique**
Students	360	Simple random Sampling
Class Coordinators	10s	Snowball sampling
Total	**370**	

2.6. Data collection methods

According to Bines, et al., (2004), data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. In this study, quantitative data were collected using structured questionnaires developed in English, to elicit responses from the study participants. The questionnaire was used to explore the individual characteristics of the participants, and information on the social-cultural, social-economic, and religious factors associated with the uptake of Covid-19 vaccines among students. For qualitative data, focused group discussion and in-depth interviews were used to obtain information from the students' coordinators to gain their perspectives on the factors that affect the uptake of Covid-19 vaccines.

2.7. Data quality control

Validity

Fraenkel and Devers (2000) defined validity as the appropriate meaningfulness of inferences a researcher draws based on data obtained through the use of an instrument. In this study, the researcher designed questions that were discussed with the supervisors such that the information obtained may enable the researcher to make correct analyses, interpretations, and conclusions about the topic of the study and the ethical principles. The questionnaire was tested by the experts before using it in the field to ensure content validity and was calculated as:

Where CVI is content validity Index

Each objective was abbreviated as;

Prevalence of the uptake of Covid-19 vaccines = PUCV

Social-cultural factors associated with the uptake of Covid-19 Vaccines =SCFAUCV

Social-economic factors associated with the uptake of Covid-19 vaccines = SEFAUCV

Religious factors associated with the uptake of Covid-19 vaccines = RFAUCV

For PUCV QN = = 0 86

For SCFAUCV QN = \frac9{10}\;= 0 9

For SECFAUCV QN = \frac79\;= 0 78

According to Amiin (2005), for the instrument to be acceptable, the average index should be 0.6, and agreeing to table 2 above, the current instrument surpassed it making it valid. The closer to 1.0 the CVR is, the more essential the object is considered to be valid.

Reliability

Fraenkel and Dever (2000) defined reliability as a consistency of score or answer provided by an instrument. An instrument is reliable if it produces the same results whenever it is repeatedly used to measure a trait or concept from the same respondents even by another researcher. In order to guarantee reliability, the researcher runs a reliability statistic using Cohen's Kappa statistics to determine the consistency of the research study results from the equation below.

$K = \frac{P_O - P_e}{1 - P_e}$

Where P_O = Relative agreement among observers

P_e = Hypothetical probability of chance agreement

$P_O = \frac{30+2}{43} = 0.88$

$P_e = \left(\frac{30+2}{43}\right) \times \left(\frac{30+3}{43}\right) + \left(\frac{2+8}{43}\right) \times \left(\frac{8+3}{43}\right)$

$[(0.744) \times (0.767)] + [(0.233) \times (0.256)]$

$0.571 + 0.0596$

$= 0.63$

$K = \frac{0.88 - 0.63}{1 - 0.63}$

$= \frac{0.25}{0.37} = 0.68 = \mathbf{0.7}$

The test above indicated that Cohen's Kappa

Table 2: Showing Content validity index of the questionnaire used in the study

QN	**CVI**	**Percentage (%)**
PUCV QN	0.86	86
SCFAUCV QN	0.9	90
SEFAUCV QN	0.78	78
RFAUCV QN	1	100

Table 3: Showing the results of two observers

		Observer 2	
		YES	NO
Observer 1	YES	30	2
	NO	3	8

statistics K = 0.7**.** This means that there was a substantial agreement between the frequencies of the observers.

2.8. Data management and analysis

Data analysis involved organizing data in ways that allow researchers to see patterns, identify themes, discover relationships, develop expectations, and make interpretations, mount critiques or generate theories (Bogdan & Biklen., (1992).

Quantitative analysis: The data obtained was managed by first checking if it was complete. It was then entered into the computer for storage and later further processing. The Statistical Package for Social Sciences (SPSS) version 26 was used during analysis. Chi square and logistic regressions were used to assess factors associated with the uptake of Covid-19 vaccines among the students of Bishop Stuart University. Factors with p-values<0.2 at bivariate analysis were entered into multivariate analysis where factors with p<0.05 were considered significant.

Qualitative analysis: The study employed both thematic and content analysis techniques to analyze the qualitative data. This was because it enabled the researcher to observe patterns or speech like what the respondents talked about (Berg, 2004). The information was encoded and edited to find out if there were questions that would not be properly filled and cross checked responses to the interview guides to ensure that questions were given complete answers. Therefore, discrete bit of information was assigned into categories using themes as coding units. Important thematic areas such direct quotations were extracted and reported in line with study variable verbatim.

*2.9. **Ethical Consideration***

Research and ethical approval to conduct the study was obtained from the Research Ethics Committee (REC) of Bishop Stuart University. This enabled transparency and verification of the authenticity of the data collected.

Informed consent was obtained from each study participant ensuring that no one was forced or coerced into participating in this study.

Confidentiality was observed by making sure that the information provided by the research participants were recorded and analyzed anonymously with no one's name mention hence protecting their identity and degree of freedom in participating in the study.

The study avoided fabricating, falsifying, or misrepresenting research data to promote the truth. This was done by carrying out data collections from the intended categories of the respondents, took permission from the authorities to carry out this data collection and work from other scholars incorporated in this current study

were duly acknowledge through citations and reference lists.

3. Results

3.1. Response rate

The study had total sample of 370 participants; of these, 360 respondents answered a standard questionnaire, 10 participants were interviewed and as shown in table 4, 360 questionnaires were distributed and 360 were returned with a percentage of 100% (n= 360). This was an indication of a good return rate because Mugenda and Mugenda as sited by Datche, et al., (2015) accentuated that response rate of at least 50% is adequate. This high response rate was achieved by administering the questionnaires through active follow up with each individual who accepted to answer the questionnaire. This was done to avoid wastage and losses of questionnaire.

3.2. Socio-demographic characteristics of respondents.

Information about the demographic characteristics of the sample being studied as described in this section. The characteristics of the respondents analyzed included the following; age, gender, religious affiliation, year of study, and family income levels of the respondent. These socio-demographic characteristics were presented only to enable the reader to understand the sample characteristics but not necessarily to address the study objectives but to determine whether they were related to this study's objectives. The findings were as shown in Table 5 which indicated that the majority of the respondents were females, 52.2% (n=193), students aged $\leq$30 years, 59.2% (n=215), those from middle-income, 57.3% (n=212), Christians, 60.8% (n = 225) and undergraduates, 89.2% (n = 330).

3.3. The prevalence of the Uptake of Covid-19 Vaccines among the students

The researcher wanted to know the number of respondents who had been vaccinated against Covid-19 and those who had not been vaccinated against Covid-19. The findings below indicated how they responded. Data was collected using Yes or No to determine their level of response through descriptive statistics.

Figure 1 shows that out of 370 respondents, the prevalence of uptake of Covid-19 Vaccines among the students at BSU was 57.0%. All students that had taken Covid-19 Vaccines among the students at BSU reported uptake of one dose of AstraZeneca, 13.2%, which is not a complete dose. Only 10.5%, of students, had a full dose of AstraZeneca (2 doses). However, less than one-quarter, 21.6%, received Johnson and Johnson vaccines against Covid-19. Few students reported uptake of the booster, 2.2%, whereas 9.5% reported having taken any other type of Covid-19 vaccine.

These percentages generally showed a low rate of uptake of different Covid-19 vaccines among the students of Bishop Stuart University. This would possibly mean that when the lockdown ended, many people, students of Bishop Stuart University inclusive, took Covid-19 and the uptake of Covid-19 vaccines less seriously.

4. Discussion

The general uptake of Covid-19 vaccines among the students of Bishop Stuart University with a full dose was low as shown by the results of those who took a full dose of AstraZeneca, Johnson & Johnson, or any other Covid-19 vaccine. These study findings were in disagreement with the findings of Tavolacci et al., (2021) on COVID-19 Vaccine Acceptance, Hesitancy, and Resistance among University Students in France. The findings showed that 58.0% of students would choose to have the vaccination, 17.0% would not and 25.0% were not sure. This indicates that however much the highest number of students would choose to be vaccinated; many other students would possibly slow down the vaccination process. This could be attributed to the different settings of the respondents and their experience with Covid-19. This is to say, the students in France might have had a different experience of Covid-19 that prompted them to embrace the vaccination

Table 4: Showing the Questionnaire return rate

Categories	Supplied/conducted	Actual	Percent (%)
Questionnaires	360	360	100
Interviews	10	10	100
Total	370	370	100

Table 5: Showing Socio-Demographic characteristics of respondents

Characteristics		Frequency (percent)
Gender	Female	**193 (52.2)**
	Male	177 (47.8)
Age (years)	$\leq$ 30 years	**215 (59.2)**
	>30 years	148 (40.8)
Family income	Low	108 (29.2)
	Middle	**212 (57.3)**
	High	50 (13.5)
Religious affiliation	Christians	**225 (60.8)**
	Muslims Other	84 (22.7) 61(16.5)
Program	Undergraduate	**330 (89.2)**
	Postgraduate	40 (10.8)

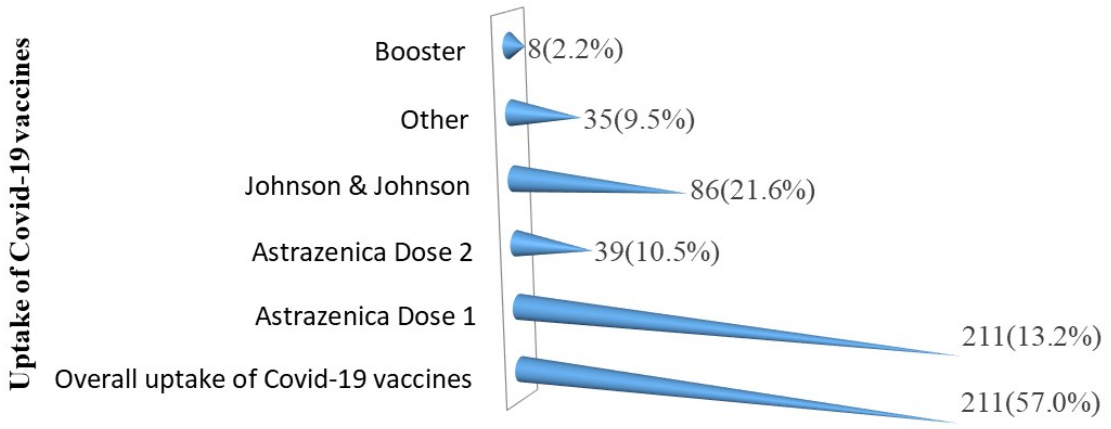

Figure 1: Showing the uptake of Covid-19 vaccines among the students of Bishop Stuart University

process compared to the students of Bishop Stuart University.

The findings were in agreement with the findings of WHO (2022) regarding the low rate of Covid-19 vaccine uptake where Uganda had several COVID-19 vaccination doses administered per 100 people which rose to only 37 as of March 19, 2022. This number was still very low compared to the 70% requirement for the vaccinated individuals that should be vaccinated if the population was to have herd immunity to fight Covid-19 in the population. The uptake of Covid-19 vaccines was still low at the time of the study and would otherwise impact the work of public health professionals in the efforts to prevent the general public from Covid-19 through vaccination.

The general findings in this section would possibly mean that when the lockdown was lifted, businesses and other daily activities resumed, the general public got an impression that Covid-19 was no longer a threat and forgot about their responsibilities to vaccinate against the deadly virus, as so did the students of Bishop Stuart University. However, this could be a fertile ground for further research.

5. Conclusion

Even though more than half of the students of Bishop Stuart University were vaccinated with at least one of the vaccines against COVID-19 vaccine; the general uptake of Covid-19 vaccines among these students with a full dose was low as shown by the results of those who took a full dose of AstraZeneca, Johnson & Johnson or any other Covid-19 vaccine. This would mean that the majority of the students of Bishop Stuart University were still at risk of experiencing fatal effects of Covid-19 irrespective of whether one has taken a half dose or not vaccinated. The only students who do not experience severe health effects of the virus are those with full doses since we scientifically believe that their immunities are strong enough to fight the virus.

6. Limitations

The researcher faced some challenges such as late clearance to go for data collection.

Time was another factor to make sure the study was conducted and completed within the time frame.

Financial resources were a challenge to the study and it never received any external funding or donation of any kind.

7. Recommendation

The study recommended that effective sensitization and psycho-education should be carried out to educate the general public about the effectiveness of the uptake of Covid-19 vaccines.

8. List of Abbreviations

BSU: Bishop Stuart University

COVID-19: Coronavirus disease

HBM: Health Belief Model

SARS‑COV‑2: Severe acute respiratory syndrome coronavirus 2

WHO: World Health Organization

9. Source of funding

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10. Conflict of interest

The authors declare that there was no conflict of interest.

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