# PREVALENCE OF THE UPTAKE OF COVID-19 VACCINES: A CROSS-SECTIONAL STUDY AMONG THE STUDENTS OF BISHOP STUART UNIVERSITY.

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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 was employed. Data was collected from a sample of randomly selected 370 respondents between $11^{th}$ 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, university, Date submitted: 2022-12-17 Date accepted: 2022-12-22

## 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).

The global trend of Covid-19 vaccine uptake was reported in a study carried out by Wang et al., (2022) from a total of 15690 articles through database searches for studies covered January 2020 to December 2021, the pooled acceptance rate of COVID-19 vaccination was 67.8% (95% CI: 67.1–68.6). Acceptance rates varied among different populations; children and adolescents (70.7%, 67.6–73.9) had the highest acceptance rate, followed by adults (69.1%, 68.2–70.1), university students (67.7%, 62.7–72.8), healthcare workers (67.5%, 64.4–70.6), and patients with chronic disease (67.4%, 63.9–70.9), while pregnant/breastfeeding women (54.0%, 46.3–61.7) had the lowest acceptance rate (Wang et al., 2022). The study also investigated the proportion of participants who were unwilling to get a COVID-19 vaccine, and found the pooled level to be 20.4% (95% CI:19.6–21.3) and it ranked from high to low for pregnant/breastfeeding women (41.9%, 33.0–50.8), university students (20.7%, 17.2–24.2), adults (19.8%, 18.5–21.1), children and adolescents (19.8%, 17.9–21.7), healthcare workers (19.8%, 17.7–21.9), and patients with chronic diseases (16.9%, 13.9–19.9) (Wang et al., 2022). The pooled uptake rate was 42.3% (95% CI: 38.2–46.5) until November, 2021 where Healthcare workers (54.1%, 46.5–61.7) had the highest uptake rate, followed by university students (43.7%, 31.2–56.1), adults (39.7%, 32.4–47.1), patients with chronic disease (39.3%, 31.9–46.7), and children and adolescents (37.9%, 22.5–53.4), while pregnant/breastfeeding women (7.3%, 1.7–12.8) had the lowest uptake rate.

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 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; there are many other students who 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 in order 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 stu-

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dents, were supposed to take this campaign serious because it's vaccination that would help to bringing Covid-19 cases down. But most students seemed to have not picked interest in this campaign which let 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 the University students.

In spite of the studies carried out on the prevalence of the uptake of Covid-19 vaccines among University students, a study of the 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

### *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 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 from Bishop Stuart University between 11th July and 3th October 2022. Bishop Stuart University has two campuses: Kakoba which is the main campus of the university on 48.2 hectares of land, 5km East of Mbarara City on plot 150, Buremba Road, Kashari Block 4, Kakoba Hill. Ruharo Campus, which is located at Ruharo hill in the neighborhood of the Diocesan Cathedral of St. James.

### *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 the 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. 70% of these students (3500 students) need to be vaccinated if the students' population was to acquire herd immunity.

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: Student below the age of 18, those who had finished from 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 meaning that the sample is chosen without bias. Snowball sampling technique is used in non-probability sample 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 snowball sampling strategy was used in selection of students' coordinators to participate in the study. Simple random sampling technique was preferred for this study because the researcher aimed at ensuring that each student in Bishop Stuart University has equal chances of being included in the study so as to avoid biases.

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 was determined using Slovin's formula as cited by Yamane (1967) which is

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

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

Where, = 370 students
n = Sample size
N= population size
e= co-efficiency level of precision (0.05)
n=370 students

The sample, therefore, consisted of 380 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. 370 students were chosen to participate in the quantitative study because they could provide 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 on a daily basis and could bring out some information that would otherwise not been given by the students they coordinate.

*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 was 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, information on the social-cultural, social-economic and the 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 appropriate meaningfulness of inferences a researcher draws based on data obtained through the use of an instrument. In this study, the researcher designed questions which were discussed with the supervisors such that the information obtained may enable the researcher to make correct analysis, interpretations and conclusions about the topic of the study and the ethical principles. The questionnaire was tested through a pilot study of 10% of the respondents before using it in the field to ensure content validity and was calculated as:

$$\text{CVI} = \frac{\text{Total number of items receiving positive rating of content relevance}}{\text{total number of items on a measure.}}$$

Where CVI is content validity Index
Each objective was abbreviated as;
Prevalence of the uptake of Covid-19 vaccines = PUCV
Socio-cultural factors associated with the uptake of Covid-19 Vaccines =SCFAUCV
Socio-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 = \frac67\;= 0 86
For SCFAUCV QN = \frac9{10}\;= 0 9

Table 1: Showing Sample size methodological matrix

| **Population** | **Sample size** | **Sampling technique** |
|---|---|---|
| Students | 370 | Simple random Sampling |
| Class Coordinators | 10 | Snowball sampling |
| **Total** | **380** | |

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 |

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 consistence 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 trait or concept from the same respondents even by another researcher. In order to guarantee reliability, the researcher run 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

$P_O = \frac{30+8}{43} = 0.88$

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

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

$0.571 + 0.0596$

$= 0.63$

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

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

The test above indicated that Cohen's Kappa 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).

#### *2.8.1. **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.

#### *2.8.2. **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

Table 3: Showing the results of two observers

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

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 was described in this section. These 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 understand the sample characteristics but not necessarily to address the study objectives but done to determine whether they were related to this study 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 vaccinated against Covid-19 and those who had not vaccinated against Covid-19. The findings below indicated how they responded. Data was collected using Yes or No to

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 | | n (%) |
|---|---|---|
| Gender | Female | **193 (52.2)** |
| | Male | 177 (47.8) |
| Age (years) | $\leq$ 30 years | **215 (59.2)** |
| | >30 years | 155 (41.9) |
| 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) |

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%, 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 booster, 2.2%, whereas 9.5% reported to have taken any other type of Covid-19 vaccines.

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 was ended, many people, students of Bishop Stuart University inclusive, took Covid-19 and the uptake of Covid-19 vaccines less serious.

## 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 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; there are many other students who would possibly slow down the vaccination process. This could be attributed to different settings of the respondents and their experience of Covid-19. This is to say, the students in France might had had a different experience of Covid-19 that prompted them to embrace the vaccination process compared to the students of Bishop Stuart University.

The findings were in agreement with the find-

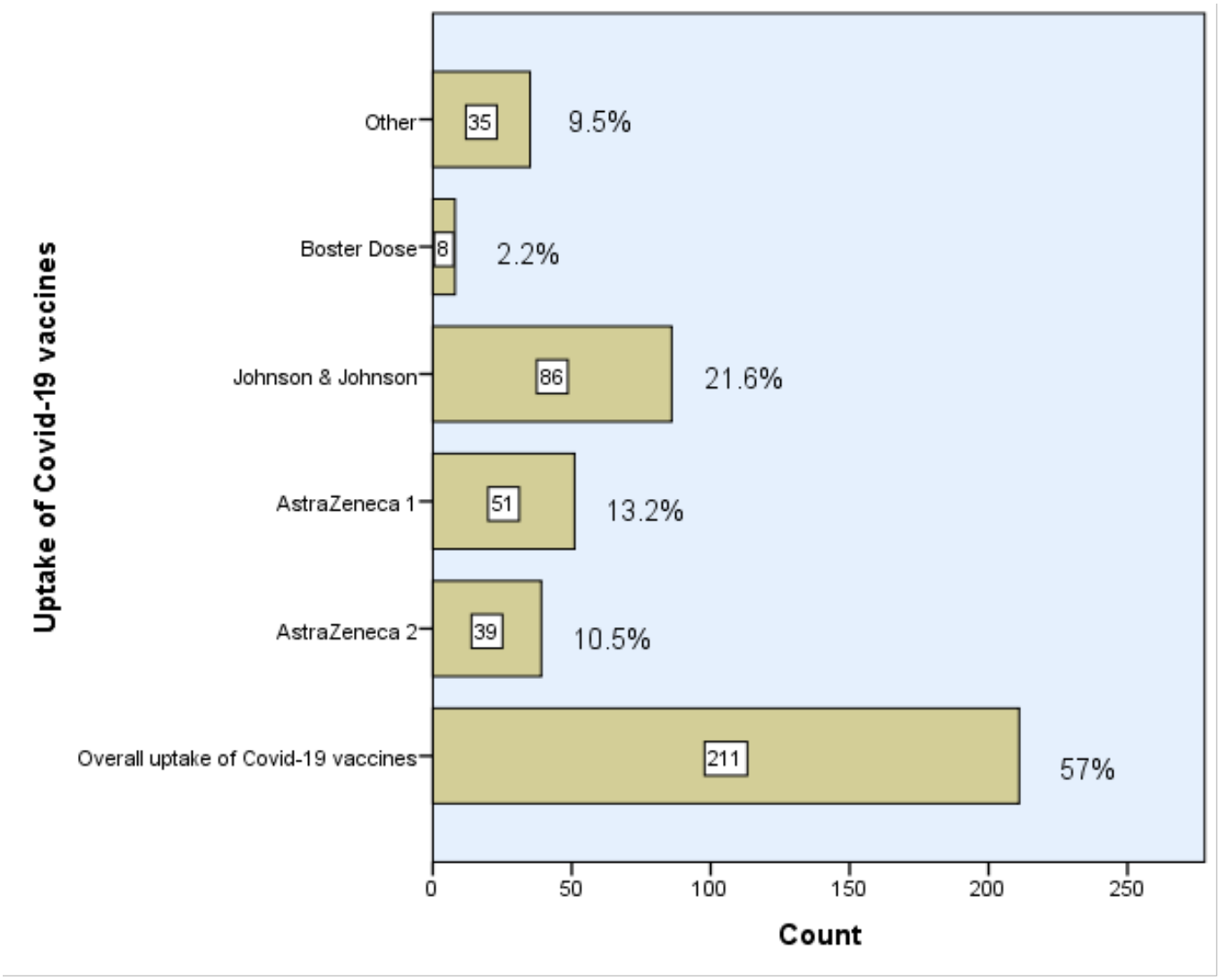


Figure 1: Showing the uptake of Covid-19 vaccines among the students of Bishop Stuart University

ings of WHO (2022) regarding the low rate of Covid-19 vaccines uptake where Uganda had the number of COVID-19 vaccination doses administered per 100 people that 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 heard immunity in order 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 on 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 also 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.

To policy makers, this would imply that it is possible that Covid-19 virus would quickly spread again and the groups that are more susceptible to hospitalization and other medical complications continue to be at risk as well as everyone in the population.

## 5. Conclusion:

Despite the fact that 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 half dose of not vaccinated. The only students who 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 late clearance to go for data collection.

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

The researcher faced some challenges pertaining getting the number of students who were vaccinated in the University of Bishop Stuart however much she got to know that at the Faculty of Nursing and Health Sciences it was a requirement to have 75% of the vaccinated individuals both students and staff inclusive for the programs to run smoothly. It was difficult to generalize this information to suit the number of the whole University.

The researcher faced a challenge of failure to evidence to prove that the respondents were actually vaccinated since vaccination cards were not asked during data collection.

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. This will help in demystifying the information, beliefs and myths that surround Covid-19 and the vaccines available in regard to the virus.


## 8. Acknowledgement

We acknowledge the financial support of Mr. Akimpaye Evariste towards, tuition clearance, data collection activities and other financial expenses in relation to this study. We also thank the Bishop Stuart University's Research Ethics Committee-REC for reviewing the study protocol and providing the ethical clearances required to conduct the study. We appreciate the contribution of the respondents for availing the data that brought us all this far.


## 9. 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


## 10. Source of funding

The study was funded by Mr. Akimpaye Evariste. Akimpaye had no role in the study design, data, collection and analysis, decision to publish, or preparation of the manuscript.


## 11. Conflict of interest

The authors declare that there was no conflict of interest.

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