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UPTAKE OF CERVICAL CANCER SCREENING SERVICES AND ASSOCIATED FACTORS AMONG HIV POSITIVE WOMEN IN MUKONO GENERAL HOSPITAL, A HIGH-VOLUME FACILITY IN CENTRAL UGANDA: A CROSS-SECTIONAL STUDY.

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ABSTRACT

Background
The main objective of the study was to identify the factors associated with the uptake of cervical cancer screening services among HIV-positive women at Mukono General Hospital, a high-volume facility in Central Uganda.

Methods
A cross-sectional study design was used, and quantitative data was collected from 417 HIV patients attending Mukono General Hospital. Systematic random sampling was used, and data was collected using interviewer-administered questionnaires. Modified Poisson regression analysis was used to identify the significance associated with the uptake of CCS at 95% confidence.

Results
The average age of study respondents was 34.4 years with the majority 63.5% (265/417) married and 86.4% (360/417) having a non-detectable viral load. Slightly more than a third 38.6% (161/417) reported having carried out CCS, of which 76.4% (123/161) did it within the last 3 years. Predictors associated with CCS included being of Basoga tribe [APR=1.27, CI=1.07-1.51, P=0.007], Perceiving that CC is curable [APR=0.68, CI=0.48-0.96, P=0.031], believing to be at risk of contracting [APR=3.08, CI=1.94-10.09, P=0.045], having a peer diagnosed with CC [APR=1.14, CI=1.08-1.34, P=0.03], perceiving that screening procedure was nasty [APR=0.70, CI=0.58-0.85, P<0.001], learning about CCS from media [APR=0.074, CI=0.54-0.01, P=0.047] and rating health workers as being professional [APR=2.59, CI=1.23-5.46, P=0.01].

Conclusion
There was generally a low uptake of CCS among HIV/AIDS patients. Strategies to increase the uptake of CCS among the study population should hinge on addressing the knowledge gap and negative perceptions among HIV patients.

Recommendation
District health authorities should conduct regular awareness creation campaigns, targeting HIV-positive women on CC preventive measures.

Keywords: *Cervical cancer screening, HIV-positive women, Uptake*
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BACKGROUND

Cervical cancer is the fourth most common cancer among women worldwide, accounting for roughly 570,000 new cases and 311,000 deaths in 2018. (1). Every year, developing countries account for more than 80% of all new (CC) cases and deaths (2). It is the most common cancer among women in sub-Saharan Africa (3). The increase in incidence and low awareness of this disease is concerning. Addressing these issues through education and awareness campaigns could potentially reduce mortality rates. (4). Facilities for prevention and treatment are still very inadequate in many countries in the region (5).

Annual screening for high-risk women, especially those living with HIV, is crucial for early detection and treatment of precancerous lesions (2). This proactive approach can significantly improve health outcomes and reduce cancer risk. (6, 7). In Uganda, uptake of CCS is as low as 4.8% (8). The projections for new cervical cancer cases and deaths in Uganda by 2025 highlight a critical public health challenge. There is an urgent need for increased awareness, prevention strategies, and improved healthcare access to combat this issue

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effectively. (8) Consequently, the country created a national strategic plan for the prevention and control of cervical cancer (CC) to provide information about its prevention and treatment to at-risk groups, including women living with HIV. (9). However, the uptake of CCS services among these risky groups is still low despite government initiatives.

The Uganda Ministry of Health (MOH) equipped general hospitals with medical supplies and recruited healthcare facility staff to provide CCS services to those eligible. However, uptake among HIV-positive women remains low. A nationwide study in Uganda found CCS uptake among HIV-positive women to be at only 30.3% with the highest uptake being in Kampala- the capital city of Uganda (44.0%) (10). This low uptake of CSS has significantly contributed to the increased burden on this vulnerable group. Despite these strategies by the MOH, uptake of these services, especially among HIV-positive women is still low. This study therefore aimed at determining the factors associated with the uptake of cervical cancer screening services among HIV-positive women at Mukono General Hospital, a high-volume facility in Central Uganda to guide the design of evidence-based interventions geared towards reducing the public health burden of CC among these vulnerable populations.

METHODS

Study setting and design

The study was carried out in March and April 2023 at the Mukono government-aided General Hospital located in Mukono Central Division, which is in one of the two divisions that make up the Mukono municipality of Mukono district in Central Uganda. The facility is approximately 25 kilometers by road to Kampala, the country's capital. A facility-based cross-sectional study design was employed using quantitative data collection and analysis methods.

Study population and sample size

This was carried out among HIV-positive women enrolled at the ART clinic of Mukono General Hospital in central Uganda. We used the Kish Leslie formula, $n=Z2p(1-p)\ d2$ to compute a sample size of 417 participants considering a 10% non-response rate, where n-sample is the size estimate, Z is the standard normal value corresponding to the 95% confidence interval (1.96), p is the estimated proportion of HIV positive women ever screened for CC in urban central Uganda (44.0%) (10). And d is the degree of precision.

Sampling and selection criteria (Inclusive and Exclusive)

A total of 417 respondents were selected by systematic simple random sampling based on the arrival time and registration during ART clinic days. The first study respondents to participate on each day were randomly selected by listing down all patient identification numbers (IDs) on pieces of paper and randomly choosing one. The specified ID number was the first person to participate in the study. Subsequent participants were chosen by taking an interval of 5 clients. This was done for 30 working days. Participants included stable HIV-positive women above 18 years enrolled in ART and residing in Mukono district, who had their appointments during the data collection period. Only those who agreed to provide written informed consent participated in the study.

HIV-positive women who visited Mukono general hospital ART clinic and were 18 years and above but did not reside in Mukono district and/or were seriously ill, could respond to the questions on the study collection tool but were excluded from the study.

Data collection methods and tools

Since the population was largely illiterate, a quantitative method of data collection was used using an interviewer-administered questionnaire. A pre-tested standard structured questionnaire adopted from the reviewed literature was used to collect data (11). The questionnaire was translated into *Luganda*, the predominant local dialect spoken in Mukono district. To minimize the potential sources of bias, cross-checking with health facility records was done to verify the accuracy of self-reported data, particularly regarding participants' claims of having undergone screening.

Data analysis

Analysis was carried out at univariate, bivariate, and multivariate levels. At the univariate level, analysis was run for all the variables. Measures of central tendency and dispersion were used to describe continuous variables. Categorical variables were described using frequencies and percentages. At the bivariate level, the outcome variable was the uptake of screening measured as a proportion of women who had undertaken at least one CCS test in a lifetime. Modified Poisson regression analysis was used to identify the significant associations between the outcome variable and predictor variables at a 95% confidence interval. This test was preferred because the prevalence of the outcome was above 10%. Variables that showed significant association in bivariate analysis were included in the final multivariate model built by a step-wise approach. Results were presented in tables using adjusted prevalence ratios, p values, and their 95% confidence intervals.

Ethics declarations

Ethical approval was obtained from Uganda Martyrs University at the Faculty of Health Sciences Research Committee. Permission to collect data was sought from the administration of Mukono General Hospital and the ART clinic. Individual study respondents voluntarily

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provided informed consent to carry out the study. All information provided by the respondents was kept confidential.

RESULTS

Figure 1: Reporting the numbers of individuals at each stage

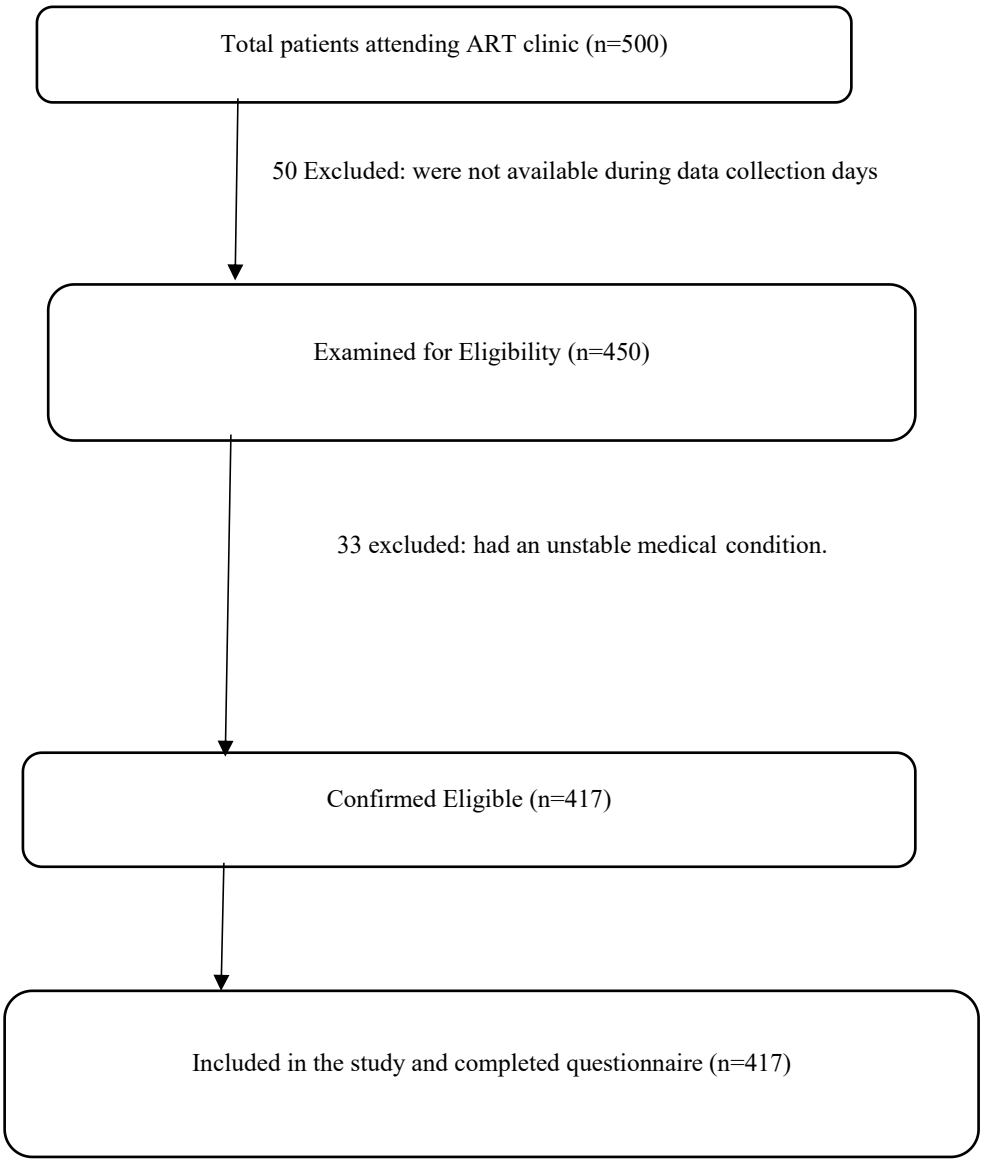

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Table 1: Socio-demographic characteristics

Variable	Category	Frequency (n=417)	Percentages (%)
Age of respondent (years)	18-25	54	13.0
	26-30	106	25.4
	31-40	172	41.3
	41 and above	85	20.3
Age of spouse (years)	<30	95	22.8
	31-40	108	25.8
	Above 40	214	51.4
Number of biological children	<2	101	24.2
	2-3	148	35.4
	>3	168	40.4
Monthly income (UGX)	<200,000	104	25.0
	200,000-400,000	153	36.7
	>400,000	160	38.3
Marital status	Cohabiting	67	16.0
	Divorced	85	20.5
	Married	265	63.5
Religion of respondent	Anglican	148	35.6
	Catholic	166	39.8
	Muslim	83	19.8
	*other tribes	20	4.9
Respondent's tribe	Muganda	218	52.2
	Musoga	118	28.4
	Nyankole	24	5.8
	*Other tribes	57	13.6
Respondent's education level	Primary	35	8.3
	Secondary	293	70.2
	Tertiary/university	90	21.5
Respondent's occupation	Civil servant	59	14.1
	Peasant	53	12.7
	Business	305	73.1
Distance to place of screening			
	<1km	65	15.6
	1-2km	211	50.7
	>2km	141	33.7
Participant's viral load			
	Non-detectable	360	86.4
	Detectable	57	13.6
Education level of spouse	Primary	32	7.6
	Secondary	295	70.8
	Tertiary/university	90	21.6
Occupation of spouse	Business	295	70.7
	Civil servant	61	14.7
	Peasant	61	14.6
Religion of spouse	Anglican	185	44.4
	Catholic	121	29.0
	Muslim	83	19.9
	**Other religion	28	6.7

*Luo, Itesoit, Kjongs. **Born-again, Seventh-day, Atheists

The average age of the study respondents was 34.4 years (SD±8.8). The majority, 63.5% (265/417), were married, 70.2% (293/417) stopped in secondary school, and about half, 52.2% (218/417), were Baganda by tribe. The majority, 86.4% (360/417), had a non-detectable viral load, and 70.7% (295/417) had businesses. Furthermore, the study respondents' average monthly income was about 500,000/=.

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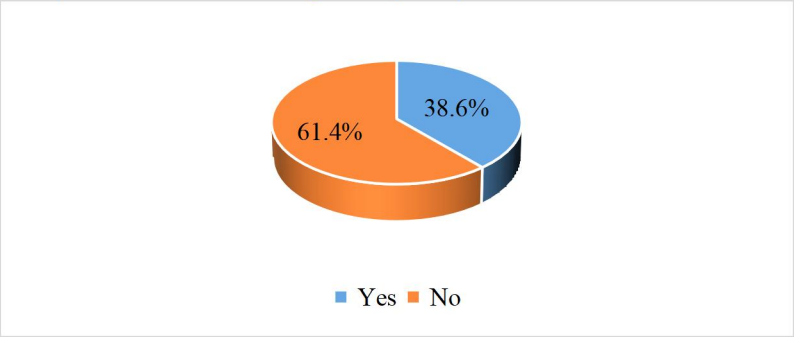
Level of uptake of CCS services

Slightly more than a third of the study respondents, 38.6% (161/417) reported having carried out CCS, of which 76.4% (123/161) did it within the last 3 years.

Figure 2: Level of uptake of CCS among study respondents



Factors associated with uptake of CCS among study respondents

The final multivariate regression model in Table 2 shows that the uptake of CSS was associated with the tribe, perception that CC is curable when detected early, perception that a mother is at risk of contracting CC, having peers diagnosed with CC, perception that screening procedure is nasty, rating of health care workers, and information source about CCS.

Basoga were 1.27 times as likely [APR=1.27, CI=1.07-1.51, P=0.007] to take up CCS compared to Baganda at 95% confidence interval. The prevalence of CC screening was 32% lower among those who perceived that CC is curable when detected early [APR=0.68, CI=0.48-0.96, P=0.031] compared to those who did not perceive so. Those who perceived that they were at risk of contracting CC [APR=3.08, CI=1.94-10.09, P=0.045] were 3.08 times as likely to take up CCS compared to those who did not perceive so at a 95% confidence interval. Study respondents who had peers diagnosed with CC [APR=1.14, CI=1.08-1.34, P=0.03] were 1.14 times as likely to take CCS compared to those who didn't have peers diagnosed with CC. Study respondents who perceived that the screening procedure was nasty [APR=0.70, CI=0.58-0.85, P<0.001] were 0.3 times less likely to utilize CCS compared to those study respondents who did not perceive it as s nasty procedure. Furthermore, the prevalence of CCS was 26% lower among study respondents who knew about CCS from media compared to those who had from a health worker from a health facility at 95% confidence interval [APR=0.074, CI=0.54-0.01, P=0.047]. Study respondents who rated the health workers at their respective health facilities as professional [APR=2.59, CI=1.23-5.46, P=0.01] were 2.59 as likely to utilize CCS compared to those who rated them as not professional.

Table 2: Multivariable regression analysis of the factors associated with uptake of CCS

Variable	Category	UPR (95%CI)	APR (95% CI)	P-value
Respondent's tribe	Muganda	1	1	
	Musoga	0.89(0.69-1.16)	1.27(1.07-1.51)	0.007*
	Nyankole	0.89(0.55-1.45)	1.11(0.88-1.40)	0.39
	Other tribes	0.64(0.43-0.94)	1.08(0.82-1.41)	0.55
CC is curable when detected early.	No	1	1	
	Yes	5.35(3.01-9.53)	0.68(0.48-0.96)	0.031*
Think they are at risk of contracting CC	No	1	1	
	Yes	4.43(2.19-8.94)	3.08(1.94-10.09)	0.04*
Have peers been diagnosed with CC?	No	1	1	
	Yes	2.63(2.11-3.29)	1.14(1.08-1.34)	0.03*
The screening procedure is nasty.	No	1	1	
	Yes	0.59(0.47-0.76)	0.70(0.58-0.85)	<0.001*
Source of information about CCS	Health worker	1	1	
	Media	0.19(0.13-0.29)	0.74(0.54-0.91	0.047*
	Peers	0.35(0.17-0.70)	0.65(0.19-2.20)	0.49
	Other sources	0.34(0.20-0.59)	0.84(0.53-1.33)	0.46
Rating of health workers	Not professional	1	1	
	Professional	3.95(2.31-6.76)	2.59(1.23-5.46)	0.01*

**Statistically significant, P<0.05*

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DISCUSSION

The findings show that slightly more than a third of the study respondents (38.6%) reported having screened for CC. Low uptake of CCS among study respondents in this current study implies that there are high chances of diagnosis of late stages of CC, hence increased chances of deaths among this study group. These findings agree with those conducted by (4) Which revealed the national uptake of CCS in Uganda was 30.3%; with the highest being Kampala (44.0%). The findings are however way higher than those carried out by Ndejjo where only 4.8% of the respondents had been screened for CC. (8). It is however important to note that the former study was carried out among all women regardless of their HIV/AIDS status, contrary to the current study. Therefore, more sensitization and health education campaigns need to be conducted among these vulnerable groups to increase CCS uptake.

Of the study respondents who had been screened for CC, our findings reveal that about three-quarters were screened once in a lifetime. American Cancer Society and World Health Organization (WHO) recommend that women aged 25 to 65 should have a primary human papillomavirus (HPV) test every 5 years. If primary HPV testing is not available like in low-income settings of Uganda, screening may be done with either a co-test that combines an HPV test with a Papanicolaou (Pap) test every 5 years or a Pap test alone every 3 years. The frequency may even be more often for vulnerable groups like women living with HIV/AIDS. Findings from this study agree with findings from a cross-sectional study carried out by (12). The current study findings imply that health workers should always encourage patients to come back for screening every 3 years.

Study respondents who knew that CC is curable when detected early were more likely to go for CCS. Different studies (4, 13, 14) Have shown similar findings. Increasing awareness levels leads to increased perceived risk of the disease hence going to carry out CCS. These findings imply that carrying out awareness creation campaigns by different duty bearers may lead to a significant increase in CCS among HIV/AIDS-positive women in the study area. Mothers' perception that they were at risk of contracting CC was significantly associated with the uptake of CCS. Those who perceived that they were at risk of contracting the disease were more likely to conduct the screening. The findings agree with those conducted by (15) Where respondents' perceptions were also positively associated with the uptake of CCS. This perception comes about with a level of knowledge of the severity of the disease. The findings imply that policymakers should design policies geared towards increasing HIV/AIDS patients' perceptions towards screening for CC.

Furthermore, the findings of the study revealed that the Basoga ethnic group was more likely to go for CCS compared to the Baganda ethnic group. Some other studies (16, 17) have shown a significant association between ethnicity and uptake of CCS. These significant associations were attributed to the low economic status of some tribes as compared to others. Findings in this study could be attributed to the fact that the majority of the Basoga ethnic group who were enrolled in the study frequently visited health facilities where CCS and testing were mandatory. The prevalence of uptake of CCS was 6.79 higher among those respondents who had peers diagnosed with CC compared to those who did not have such peers. This could be because those diagnosed with the disease discuss with their peers about preventative mechanisms of avoiding the disease including early diagnosis and treatment. The findings from this study agree with those carried out by (18). The findings imply that all women need to always discuss among themselves the severity of the disease and preventive mechanisms to increase the level of uptake of CCS

Respondents' perceptions about the screening procedure were also found to be negatively associated with the uptake of CCS. Various cross-sectional studies (19, 20) Also revealed embarrassment and discomfort with the procedure as one of the barriers to CCS. This could be attributed to a lack of privacy as the doctor uses a small instrument called a speculum to gently hold open the vagina. This study suggests that self-administered tests might be preferred over samples taken by a healthcare provider and might reduce the fear of pain. The prevalence of CCS was higher among study respondents who rated healthcare workers as professionals compared to those who rated them as non-professionals. This study's finding agrees with the findings of a cross-sectional study conducted in Nigeria. (17). This implies that informing HIV/AIDS patients about the health workers who carry out CCS may play a significant role in increasing the uptake of CCS services.

Respondents' source of information about CCS was also found to be significantly associated with the outcome variable. The prevalence of CCS was 26% lower among study respondents who heard about CCS from the media compared to those who heard from a health worker from a health facility at 95% confidence. This could be attributed to the fact that healthcare providers are more technical and deliver critical information regarding the benefits of doing regular CCS compared to journalists in the media. This is because they are not technical about the disease and the screening procedure. This implies that when delivering awareness creation campaigns regarding CCS it is very paramount to always use healthcare providers to pass on the message. Findings from this study agree with findings in a cross-sectional study carried out in Ethiopia. (21).

GENERALIZABILITY

These findings are specific to only Central Uganda and do not fully represent rural settings with different healthcare infrastructure, cultural practices, or levels of awareness regarding CCS.

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CONCLUSION

There was generally a low uptake of CCS among HIV/AIDS patients. Significant factors associated with the uptake of CCS included the perception that a mother is at risk of contracting CC, the knowledge that CC is curable when detected early, tribe, having peers diagnosed with CC, the perception that the screening procedure is nasty, information source about CCS and patients' ratings of the health care providers. This implies that strategies to increase the uptake of CCS among the study population should be hinged on these factors.

LIMITATIONS

Being facility-based potentially excluded those who may not have access to ART services. This excluded population had different patterns of health-seeking behaviors to CCS.

The level of uptake reported in this study may be higher than the actual population estimate since the data was collected in a hospital setting among participants already seeking services.

RECOMMENDATIONS

District health authorities should conduct regular awareness creation campaigns, targeting HIV-positive women on CC preventive measures.
Efforts should be geared towards the involvement of peer support groups for HIV-positive women to share experiences and provide motivation for CCS.
Facilities should sensitize women on the use of self-administered HPV testing to address barriers related to discomfort and privacy.
Integrate CCS into existing HIV care programs, ensuring routine and systematic screening for all eligible women during their ART clinic visits.

STRENGTHS

The study area, Mukono General Hospital, is a high-volume facility that enhances sample representativeness and the applicability of findings to similar populations in the region. The use of a systematic random sampling technique reduced selection bias thereby enhancing the reliability of the findings.

ACKNOWLEDGMENT

We extend our gratitude to the Mukono district health office for granting the research team administrative clearance to collect data.

AVAILABILITY OF DATA AND MATERIALS

Data is provided within the manuscript or supplementary information.

ABBREVIATIONS

APR: Adjusted prevalence ratio
CC: Cervical cancer
CCS: Cervical cancer screening
HIV/AIDS: Human Immune Virus/ Acquired Immune Deficiency Syndrome
HPV: Human Papilloma Virus
MOH: Ministry of Health
UPR: Unadjusted prevalence ratio
WHO: World Health Organization

FUNDING

This research study was conducted without any form of external funding.

CONFLICT OF INTEREST

The author(s) declare no conflict of interest.

CONTRIBUTIONS

Namuyiga Edna Mirembe was primarily responsible for the composition of the document, including the conceptualization, structuring, and drafting of the manuscript. Her expertise in synthesizing ideas and crafting clear and coherent narratives played a pivotal role in shaping the content.

Mukaga Humphreys undertook the critical role of data analysis, lending statistical rigor to the research. Mukaga also played a central role in presenting the results and engaging in the discussion of the findings. His analytical skills and insights were instrumental in drawing meaningful conclusions from the data.

Ejalu David Livingstone, our esteemed supervisor, contributed extensively to this manuscript by providing invaluable technical support and guidance throughout the research process. He also played a crucial role in refining the document through meticulous editing, enhancing its clarity, coherence, and scholarly rigor.

Nakitende Shamim's ability to think critically, collaborate effectively, and offer valuable suggestions greatly during data collection enriched our brainstorming sessions and contributed to the overall success of the project.

Kigongo Edith's initiative, determination, and passion for learning. Her proactive approach to self-improvement through further studies helped me set a high standard for excellence and reflect positively on the culture of continuous development.

CONSENT FOR PUBLICATION

Not applicable

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