DETERMINANTS OF ANTIRETROVIRAL THERAPY UPTAKE BY PEOPLE LIVING WITH HIV/AIDS DURING COVID-19 LOCKDOWN AT SOROTI REGIONAL REFERRAL HOSPITAL

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DECLARATION

I Eboyu Thomas declare that this research is original and this thesis has not been published and/or submitted for any other degree or award to any other university before.

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APPROVAL

We attest that the candidate worked under our direction to complete the work included in this thesis:

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DEDICATION

I dedicate this research thesis to my parents, my wife, and my siblings in appreciation of their tremendous support and encouragement.

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ABBREVIATIONS AND ACRONYMS

ART: Antiretroviral Therapy

ARVs: Antiretroviral

CDC: Centre for Disease Control and Prevention

COVID: Corona Virus Disease

HIV/AIDS: Human Immunodeficiency Virus / Acquired Immuo Deficiency Syndrome

MoH: Ministry of Health

PMTCT: Prevention of Mother to Child Transmissions

PWH: People with HIV

SARs – COV: Severe Acute Respiratory Syndrome – Corona Virus

SDGS: Sustainable Development Goals

TAF: Tenofovir Alafenamide Fumarate

TDF: Tenofovir Disoproxil Fumarate

UNAID: United Nations Action for International Development

US: United States

WHO: World Health Organisation

OPERATIONAL DEFINITIONS

Antiretroviral Therapy (ART): is a kind of HIV therapy. The treatments haven't been shown to be successful in either killing or treating the virus. They can, however, halt the illness from spreading if used simultaneously. When the virus is delayed, the sickness from HIV is slowed as well.

Patient defaulting treatment: A patient who hasn't visited the ART clinic or drugstore in more than 90 days.

Acceptability: A measure of how patients feel about healthcare professionals' their professionalism,.

Accessibility: A patient's assessment of the HIV/AIDS treatment clinic's physical location, ease of access to healthcare professionals, waiting time and facility's convenience to the patient.

Affordability: The capacity of a patient to pay for HIV/AIDS-related treatment obtained at an institution.

Availability: A measure of public opinion on who available medicine and treatments is for HIV-positive patient.

Quality: is an important customer satisfaction that seeks to uncover basic gaps that firms have while attempting to exceed consumers' expectations for the customer experience.

Uptake: is the rate or act of taking ART medication

ABSTRACT

Human Immunodeficiency Virus (HIV) is still one of the diseases that has a severe impact on public health and economic development worldwide. The outbreak of Covid-19 pandemic in 2019 disrupted several services including health sector among others. Any interruption in the fight against HIV and AIDS leads to detrimental effects such as lowering the CD4 count level that may subsequently lead to an increase in new infections and death of patients, thereby hindering the achievement of the UNAID's target of 95% of infected persons knowing their status, 95% acquiring treatment and 95% of patients being suppressed of the virus by 2030 in Uganda.. This study examined the factors that influenced uptake of Anti-Retroviral Therapy (ART) during the first Covid-19 lockdown in Soroti referral hospital catchment area in Eastern Uganda. Open ended questionnaires were used in a cross-sectional study to investigate the factors that influenced the uptake of ART. Patients' records at the ART clinic were reviewed to obtain information on their ages and the number of ARV refills. Descriptive, bivariate and multivariate analyses were used to identify factors that influenced uptake of ART services. A total of 179 (91.3%) participants aged 18 years and above who visited the ART clinic three month before and three months during the first total lockdown participated in the survey. Of the 179 participants, 92(51.4%) were males while 87(48.6%) were females. Participants who mentioned services were available were more likely to take up the ART services than those who said services were not available (AOR = 2.039; 95%CI = 0.850 - 4.886). The study showed that females had the highest number of tests than males. Despite females, testing more than males it was found out that females (62.4%) missed more appointments than males (37.6%) during first total lockdown. The study found out that the access and availability of the HIV/AIDS services were reduced during the first total lockdown of COVID-19 period than before the COVID 19 period. There was reduced acquisition of treatment from 86.35% before the COVID 19 pandemic to 72.02% during the COVID-19 pandemic. Implementation of decentralized ART distribution mechanisms, such as community-based ART groups and home deliveries, to ensure uninterrupted access to medication during emergencies should be put in place.

CHAPTER ONE: INTRODUCTION

1.1 Background

Human Immunodeficiency Virus is one of the diseases that remain a severe public health and development concern worldwide. Since its early 1980s discovery, it has claimed the lives of almost 35 million people. By the end of 2018, there were about 37.9 million people living with HIV (Bouza *et al*., 2022), with 1.7 million individuals contracting it for the first time (Chilaka & Konje, 2021). More than half of new HIV infections have been reported in young individuals ranging from 15 to 24 years of age, and up to one-third of HIV/AIDS patients are below the age of 25 (Nanyonjo *et al*., 2020).

With more than 20 million individuals living with HIV in 2019 and a prevalence of 6.7% among adults, HIV/AIDS is still the main cause of sickness and mortality in Sub-Saharan Africa. Additionally, more than 73% of HIV-positive patients are getting antiretroviral therapy (ART) (Tolossa *et al*., 2021).

Due to Scientific advances, HIV has been controlled with lifelong Antiretroviral Therapy (ART) resulting in reduction in mortality since the mid-2000s (Dwyer-lindgren *et al*., 2017). In order to significantly reduce new infections and deaths by 2030, the Joint United Nations Programme on HIV/AIDS (UNAIDS) has established diagnosis and treatment objectives for 2020 and 2030 (Coll *et al*., 2023). Despite these goals, a recent evaluation of the state of the HIV epidemic indicated that the world is still a long way from eradicating the disease (Dwyer-lindgren *et al*., 2017).

In Uganda HIV prevalence is three times higher among ages 20-24 than in those ages 15-19. HIV was roughly three times as common among females aged 15 to 24 than among males (Nanyonjo *et al*., 2020). According to the Ministry of Health (MOH, 2019), 1.46 million people were living with HIV at the end of 2019, with a prevalence of roughly 6% among individuals aged 15–49 years. The burden of HIV continues to be spread across different socioeconomic and demographic subgroups. There are also geographical hotspots, key and priority demographic groups that are disproportionately affected across the country. By the end of 2019, almost 85% of HIV-positive people in the country had been diagnosed, with a large number having started treatment. The vast majority of them had achieved viral load suppression.

However, emergence of Covid-19 pandemic in 2019 disrupted transport, education and health services among others. The measures to control the spread of Covid-19 included a ban on all public and private transportation, night curfews, school closures, suspension of religious and social events, and the closing of non-essential stores and marketplaces. These restrictions impeded access to ART by people living with HIV/AIDS. Global lockdowns and travel restrictions posed a danger to the production and supply of tenofovir-lamivudine-efavirenz and tenofovir-lamivudine-dolutegravir, which are the first-line treatment for an estimated 80% of HIV patients in low- and middle-income countries (Kagimu *et al*., 2021).

Furthermore, directives in Uganda to give the Resident District Commissioners (RDC), Resident City Commissioners (RCC), and Local Council 1 (LC1) the authority to issue travel permits to people living with HIV and AIDS was one of the factors that discouraged the AIDS patients from

accessing healthcare because most people still kept their status hidden from others (Zakumumpa *et al*., 2021) .

There was need to examine the factors that significantly affected uptake of ART by people living with HIV and AIDS at Soroti Regional Referral Hospital catchment area during Covid-19 pandemic lockdown.

1.2 Statement of the problem

The emergence of the COVID-19 pandemic in 2019 significantly disrupted healthcare systems globally, including efforts to combat HIV/AIDS. The lockdown measures and travel restrictions imposed by the Ugandan government to curb the spread of COVID-19 limited access to healthcare services, including Antiretroviral Therapy (ART) for people living with HIV. As a result, many patients missed their ART refills, increasing the risk of drug resistance, disease progression, and mortality. Additionally, fear of COVID-19 exposure led some healthcare providers to hesitate in treating patients with flulike symptoms, further hindering access to ART services.

Uganda's Ministry of Health mandates that all individuals diagnosed with HIV should immediately initiate and adhere to ART. To support this, the government and international organizations have implemented free HIV testing, ART provision, and public health education programs. During the COVID-19 lockdown, Resident District Commissioners (RDCs), Resident City Commissioners (RCCs), and Local Council 1 (LC1) officials were authorized to issue travel permits for HIV positive individuals seeking medical care. However, stigma, fear of disclosure, financial constraints, and logistical

challenges still affected ART uptake, limiting the effectiveness of these interventions.

Despite these known challenges, limited research has been conducted to comprehensively analyze the specific factors that affected the uptake of ART services during the COVID19 lockdown, particularly in regional referral hospitals such as Soroti Regional Referral Hospital which was a major centre for the distribution of ART medicine and the treatment of people living with HIV and AIDS in Teso and Lango sub region. However, Soroti Hospital was gazetted as one of the treatment centres of Covid-19 in Uganda. Therefore, this research seeks to find out the extent to which transport restrictions, stigma, fear, and economic hardships influenced ART adherence during the pandemic remains unclear.

This study seeks to address this gap by examining the factors that influenced the uptake of ART treatment at Soroti Regional Referral Hospital during the COVID19 lockdown. The findings will provide critical insights into the barriers faced by HIV positive individuals in accessing treatment during public health emergencies and inform future policies to ensure continuity of ART services in crisis situations.

1.3 Objectives of the study

1.3.1 General objective

To assess the effect of demographic and socioeconomic factors that influenced uptake of antiretroviral therapy services by AIDS patients during COVID – 19 pandemic lockdown in Soroti Referral Hospital catchment area in Eastern Uganda.

1.3.2 Specific objectives

1. To examine the influence of demographic factors on the uptake of antiretroviral therapy services by HIV/AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.
2. To evaluate the effect of socio-economic factors on the utilization of antiretroviral therapy services by HIV/AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.
3. To determine the proportion of HIV patients who were diagnosed and missed treatment before and during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

1.4 Hypotheses

i. There is no significant difference between demographic factors that influenced uptake of Antiretroviral Therapy among HIV/AIDS patients before and during COVID–19 pandemic lockdown at Soroti Regional Referral Hospital.

ii. There is no significant difference beteween socio-economic factors on utilization of antiretroviral therapy services by HIV/AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

iii. There is no significant difference in the proportion of HIV patients who were diagnosed and missed treatment before and during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

1.5 Significance of the study

This study has provided information about factors that influence antiretroviral treatment uptake by HIV and AIDS patients, by identifying areas where interventions are most effective in uptake of ARVs/ART during such disruptions as COVID-19 lockdown. This is projected to minimize the number of HIV/AIDS-related deaths.

Health facilities providing HIV services can use the findings to develop a work plan for assisting HIV-positive families. This can help to modify antiretroviral treatment programs and deliver high-quality community-based volunteer counselling and testing.

The information obtained from the study can be used by policymakers to make key decisions on how best services are provided to HIV patients during pandemics or outbreaks of emerging diseases.

1.5.1 The conceptual framework of antiretroviral therapy service uptake

The conceptual framework shows the relationship between the study's independent and dependent variables. The dependent variable is ART services uptake, while the independent variables are individual characteristics, medication, and healthcare factors. Uptake of ART services depends on individual factor and drug related factors. COVID-19 pandemic lockdown was an intervening factor that affected uptake by disrupting ART services uptake.

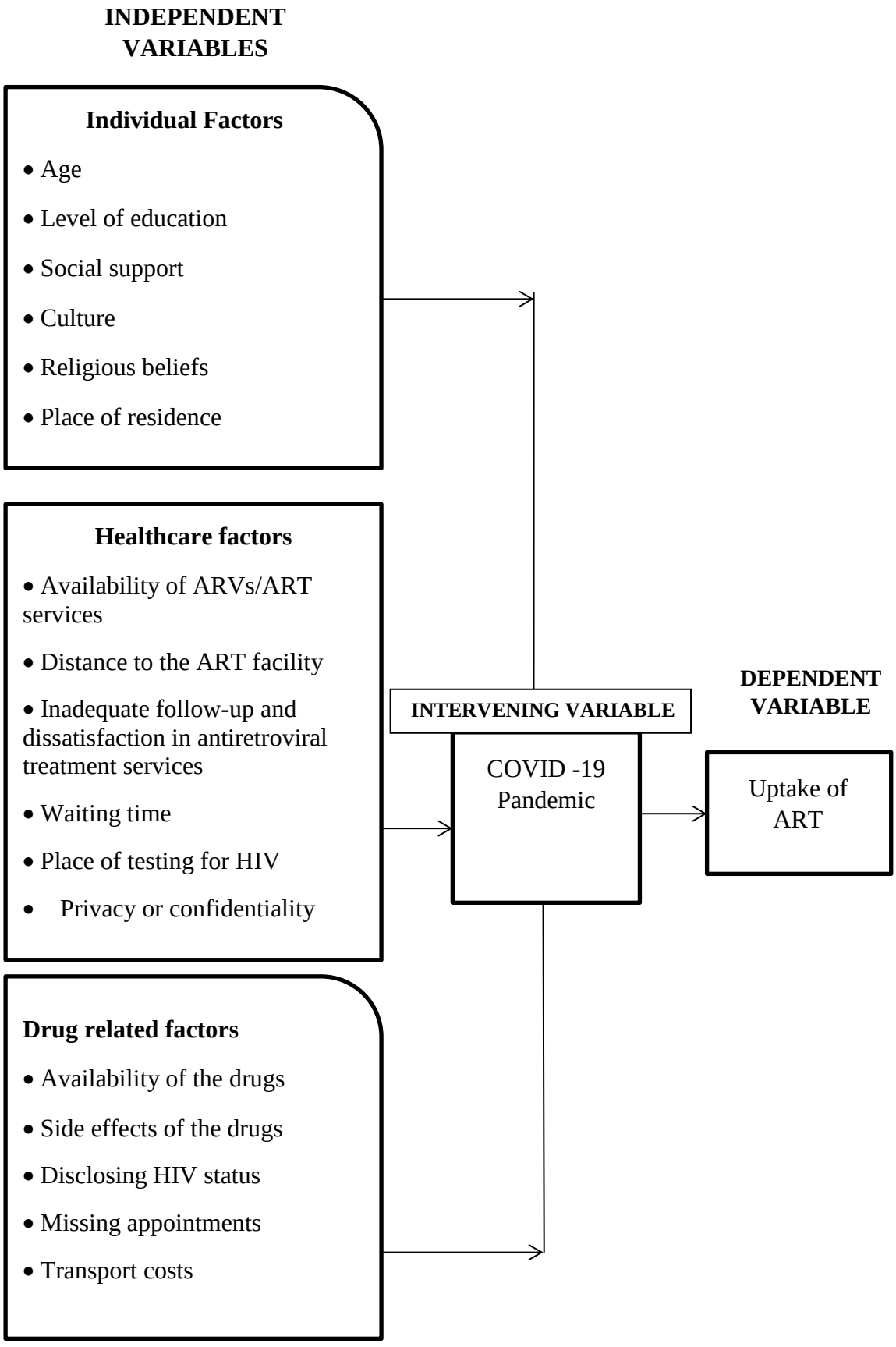

Figure 1: Conceptual framework of antiretroviral therapy uptake

1.6 Justification of the study

Soroti Regional Referral Hospital is a major centre for the distribution of ART medicine and the treatment of people living with HIV/AIDS in Teso and Lango sub region. However, Soroti Hospital was gazetted as one of the treatment centres of Covid-19 in Uganda, it served the entire districts of Teso sub region and some came from some other districts as far Kampala, Lira, Mbale and many others. This made most of the clients with HIV/AIDS to abandon their medication from the facility due to fear of contracting Covid-19 virus, this was evidenced when patients who visited the hospital started running out of the hospital when patients of Covid-19 were delivered to the hospital. Lockdown and travel ban caused some HIV/AIDS patients to miss their treatment. People were also reluctant to seek medical assistance because they feared contracting COVID-19 and some lacked transportation to reach hospitals. Some medical personnel fearing patients who came to the hospital with signs of flu and cough, even when not confirmed positive for the Covid-19 virus. This study has divided information on the influence of covid-19 lockdown on diagnosis and treatment of HIV patients that was not available.

1.7 Scope of the study

1.7.1 Geographical scope

The study was conducted in Soroti Regional Referral Hospital, which lies in the eastern part of Uganda in the city of Soroti.

1.7.2 Content scope

The study evaluated the impact of the COVID-19 Pandemic on HIV/AIDS patients' uptake of ART services at Soroti Regional Referral Hospital, in

which it quantified the persons who were diagnosed with HIV/AIDS and missed treatment before and during the COVID – 19 pandemic lockdown.

1.7.3 Time scope

The study was conducted from November 2021 to January 2022 and it involved patients who had visited the ART clinic before first total lockdown that started on 1st April 2020 and also visited the clinic during the first three months of first total lockdown (April, May and June).

CHAPTER TWO: LITERATURE REVIEW

2.1 Examining socio-demographic factors influencing the uptake of antiretroviral therapy services by HIVAIDS patients during COVID-19 pandemic lockdown.

Adhering to an ARV treatment regimen necessitates taking all of the recommended medications in the right dosages at the right times, as well as the medications that make up the ARV combination. However, taking the medicine at the incorrect time may increase viral load (Ezelote *et al*., 2024), which may result in the emergence of treatment resistance. Persons should also be sure to take the medication with or without meals. Some medications must be taken with food for maximum absorption, while others must be taken on an empty stomach for a certain period of time before or after eating (Wiesner *et al*., 2023).

It's also critical that the patient consumes the right meals, the quantity of fat ingested, for example, too much fat might alter how effectively certain drugs are absorbed. It's critical to double-check for any potential drug or substance interactions. This includes any medications prescribed for the patient or acquired in a pharmacy, supermarket, or health store, as well as complementary and alternative treatments. ARVs may interact negatively with certain recreational and illicit substances (Victor, 2010).

Particularly for persons living with HIV and AIDS (PLWHA) in underdeveloped nations, measuring adherence to ART is crucial. According to a number of studies, CD4 count is the best predictor of the development of AIDS and mortality, with treatment adherence coming in second (Shoko &

Chikobvu, 2019). Treatment failure, the establishment of a drug-resistant strain of HIV, and an increase in AIDS-related morbidity, mortality, and hospitalization are all consequences of non-adherence to ART. Non-adherence also worsens the immunological and clinical status. The most challenging and dynamic issue is adherence to ART, which is influenced by both internal and external factors, including drug side effects, psychiatric issues, poor service delivery, a lack of psychosocial support, the burden of taking a lot of pills, substance abuse, stigma, not disclosing one's HIV status, and hidden costs of care (Tadesse *et al*., 2014)

According to a study that was conducted in Kenyan on adherence among adolescents in the Kangundo District, 33.7% of the 98 participants had missed at least one appointment in the six months prior to the study, and 65.3% of the adolescents had suboptimal adherence to the clinicians' appointments. 66.7 percent and 33.3 percent of respondents, respectively, had missed their doctor's appointment by more once and twice in the six months to the survey (Kimanthi, 2016).

Study conducted in Nigeria, showing the impact of personalized adherence counselling and twice-weekly SMS reminders for adult patients revealed that 76.9% of patients in intervention had achieved adherence to drug treatment compared to 55.8% of patients in the control who had inadequate adherence to ART medication (Maduka & Tobin-west, 2013). This was linked to the quality of counselling services provided to patients.

2.1.1 Individual factors associated with uptake of ARVs/ART

2.1.1.1 Level of education

According to the study by Yaya *et al*., (2014), they discovered that PLWHA were nearly 3.6 more likely to stick to ART if they attended at least secondary level of school. Understanding and conveying knowledge about health care is greatly helped by formal education. Due to their capacity to comply with treatment recommendations given by medical professionals, educated persons may demonstrate higher adherence to ART (Dorcélus *et al*., 2021). However, additional research confirmed their results that HIV-infected individuals with a high degree of formal education had a greater incidence of ART adherence. For instance, a research conducted in the United States of America earlier revealed poor educational status as a significant contributor to ART non-adherence. Lower education was shown to be associated with obstacles to accessing ART and other HIV-related medical treatment. Peer pressure, peer position, gender, religion, sexual orientation, and culture are all variables that impact HIV voluntary counselling and testing among teenagers (Namuwonge *et al*., 2024)..

In a cross-sectional survey on ART adherence among people living with HIV conducted in the Setthathirath Hospital in the capital of Vientiane and the hospitals of Savannakhet Province in the Lao PDR, Hansana *et al*., (2013) found a correlation between education level and adherence to antiretroviral therapy (ART) treatment. The results showed that individuals with elementary or secondary education were less likely to advise adherence than those with a higher degree. Because they could afford transportation to medication

collection facilities and were aware of the need of adhering to ART therapy, individuals with university degrees had greater access to care.

2.1.1.2 Gender of the participants

According to a research done in Congo Brazzaville, women had greater rates of adherence than men did. This was linked to the fact that women had more time to devote to health care services than men who had jobs. These variations were connected to the two studies' labour hours and sample selection techniques (Lule, 2023); (Najjemba, 2018).

2.1.1.3 Age of the participants

A cross-sectional survey conducted by Mabunda *et al*., (2019) in Letaba HIV clinic to determine factors associated with ART adherence among young adults of 18-35 years old showed 79.0% to be between the ages of 18 and 29 years. According to an observational longitudinal research conducted in Mumbwa area, 150 kilometres west of Lusaka, Zambia's capital city, concerning adherence to ART during the early months of treatment in rural Zambia, it was discovered that senior respondents were more inclined than younger ones to stick to ART. Because they were mature enough to know how to manage their lives and had children they wanted to take care of so that they could grow, older adolescents were more devoted than younger adolescents (Najjemba, 2018).

2.1.1.4 Religious beliefs of the participants

Pentecostal churches are now one of the largest and fastest-growing Christian movements in today (Freeman, 2015). The 'Holy Spirit' is a fresh experience

for Pentecostal faiths. Pentecostals believe that this fresh encounter with the Holy Spirit endows them with more capacity to release others from sin, demonic assaults, and demonic possession, as well as to receive miracles and disclose promises of wealth. Pastors or other Christian leaders that emphasize on miracles, prophesies, and the spiritual healing of illnesses like HIV are often in charge of Pentecostal Christian groups (Srithanaviboonchai & Friedman, 2020).

Pentecostal churches are drawing more and more attention from people living with HIV (PLHIV) when they hear testimonies of such faith-based healing through different media. Since the beginning of the HIV epidemic in 1981, the influence of religious beliefs on the prevention, management, and care of PLHIV has been extensively acknowledged throughout sub-Saharan Africa. Numerous faith-based organizations have collaborated with organizations like the WHO and UNAIDS to provide resources aimed at preventing HIV transmission and enhancing adherence to antiretroviral therapy (ART) and care for PLHIV. Examples of these organizations include Islamic Relief, Tear Fund, Caritas Internationalis, World Conference of Religions for Peace, and the International Network of Religious Leaders living with HIV (Azia *et al*., 2022).

2.1.1.5 Marital status of the participants

Nigerian research that discovered that forgetting to take or collect medications from the ART clinic was strongly correlated with a lack of assistance to be reminded or urged to adhere to ART (Uzochukwu *et al.*, 2009). Those respondents who were single or had lost relationships to AIDS reported this to be more common. In a research conducted in urban and rural areas of Uganda,

married couples had greater rates of adherence to ART therapy among adolescents (Musiime *et al*., 2012).

2.2 Evaluating the effect of socio-economic factors on the utilization of antiretroviral therapy services by HIV/AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital (availability, accessibility and acceptability of HIV and AIDS services).

2.2.1 Availability of services associated to ART treatment at the clinic

Study by Bajunirwe *et al*., (2018), shows that participants were questioned about the availability of HIV testing and treatment services, including test kits and HIV medications. The majority of participants claimed the largest challenge was a widespread issue of medicine shortages in health institutions. Antiretroviral drugs and Cotrimoxazole were two of the most typically impacted medications. Furthermore, there was no way of informing clients whether or not the HIV/AIDS medications were available. They also indicated that as a coping mechanism, customers frequently purchase Cotrimoxazole from pharmacies and clinics. On market days, some participants said they bought drugs from the marketplaces because they were significantly cheaper. Market days are weekly meeting places of traders and sellers in specified open spaces, which are popular in rural and peri-urban Uganda. Others blamed the problem on having to go significant distances to get to the district's health centres, which makes finding medicine difficult.

2.2.1.1 Availability of the drugs

The availability of pharmaceuticals is impacted by structural variables that may not be directly connected to patients or medications, according to a study on antiretroviral therapy adherence and retention that was conducted in medium and low-income countries (Nachega *et al*., 2010). An observational longitudinal study about adherence to ART during the first few months of treatment in rural Zambia conducted in the Mumbwa district, 150 km west of Lusaka, the country's capital, found that about 70% of HIV-positive people who needed treatment obtained antiretroviral therapy (Sasaki *et al*., 2012). However, maintaining high levels of ART adherence is difficult because of the government's inadequate provision of medical supplies. Contrarily, teens who skipped appointments never received medication refills and were less likely to adhere to ART because of the time when they did not have medications to take, according to a study on factors associated with self-reported adherence to antiretroviral therapy in a Tanzanian setting (Watt *et al*., 2010). The major cause of this was a shortage of affordable transport to the ART clinics. Similar findings were published in the Ministry of Health report (2013), which showed that teenagers who received timely medication refills adhered to ART therapy more frequently than those who did not.

2.2.2 Accessibility of other facilities at the hospital by HIV patients

People with disabilities have been marginalized and ignored across the board in the HIV response. Data on HIV prevalence in people with disabilities is limited. According to data from Sub-Saharan Africa, males with impairments have a 1.48 times higher risk of HIV infection than men without disabilities, and women with disabilities have a 2.21 times higher risk (Mugisha et al.,

2024). When compared to their peers without disabilities, persons with disabilities need just as important, if not more, access to HIV prevention, care, treatment, and support, as well as sexual and reproductive health and rights to services. Lack of access to health and education, lack of support for modalities of communication such as sign language, stigma and discrimination, and greater economic vulnerability are all factors that block access (*USAIDS*, 2017).

2.2.3 Acceptability of the patients living HIV at the hospital by the medical personnel

Patient's acceptability at the facility plays an important role in adherence to treatment or not. When patient visit the facility and find medical workers who are welcoming and ready to take time with them, counsel them and share with them their pain, they will feel loved and always desire to visit the facility at any time. However, research study done by Bucyibaruta *et al*., (2018) cites that out of the eight patients that were interviewed on acceptability on patient-provider interaction only two of the patients appreciated the health workers as being kind and nice to them. It was noted that the rest of the patients indicated that health workers were rude and had negative attitudes towards the patients and they cited this has the leading cause of defaulting from treatment.

Nonetheless, study by Bwanika Naggirinya *et al*., (2022), shows that instructions and counselling by health workers were key factors mentioned as the facilitators of continued visits and up take of ART medication. One of the participant testified saying they understood the counselling and the information provided to them, this encouraged them to take their medication the same time every day.

2.3 Determining the proportion of HIV patients who were diagnosed and missed treatment before and during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

2.3.1 Diagnosis of patients with HIV and AIDS

Emergence of Coronaviruses which belong to the Coronaviridae family under the Nidovirales order and characterised by severe acute respiratory syndrome coronavirus (SARS-CoV), acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) and in turn results in pulmonary failure and death (Adnan *et al*., 2020), infected over 761 million people and of these over 6 million were killed by the disease worldwide since its emergence in Wuhan at the end of 2019. However, verification of the first SARSCoV-2 infection on March 21, 2020, in a Ugandan who had travelled from the United Arab Emirates led to first total lockdown measures (Kagimu *et al*., 2021).

The measures to control the spread of Covid-19 included a ban on all public and private transportation, night curfews, school closures, suspension of religious and social events, and the closing of non-essential stores and marketplaces (Achan *et al*., 2023). These restrictions hampered access to ART by people living with HIV/AIDS by disrupting transport and health services, among other things. But just 60% of HIV-positive persons globally are aware of their infection status (Vithalani *et al*., 2018), which hinders efforts to reach the 90-90-90 target. The Joint United Nations Programme (UNAIDS) on HIV/AIDS proposed a 90-90-90 target by 2020 (Bain *et al*., 2017); (Bajunirwe et al., 2018), with the aim of making 90% of HIV-positive people aware of their status, treating 90% of those diagnosed with antiretroviral therapy (ART), and achieving viral load suppression in 90% of those receiving

treatment. Early diagnosis of HIV is crucial for accomplishing the early treatment aim. Despite this, approximately half of the world's HIV-positive people are discovered late (Hu *et al*., 2019).

2.3.1.1 Diagnostic Tests and linkage to care

Numerous tests can be used to accurately diagnose HIV infections, but which test is best for a particular clinical presentation depends on knowledge of the natural history of HIV infections, specifically which marker is present at a particular time after infection, the volume of the specimen, and the test performance requirements (Saag, 2021). Simple serologic test for HIV antibodies that use culture derived viral antigen preparation were used to test HIV infection, it was manufactured for simple and faster testing (Parekh *et al*., 2019). Testing of HIV can also be done using immunoassays which targets the p24 antigen or anti-HIV antibodies, nucleic acid amplification tests using reverse transcription mediated amplification to detect HIV RNA (Williams *et al*., 2023).

All people diagnosed to be HIV positive should be referred and initiated to antiretroviral treatment (ART) within 30 days of diagnosis. However only 78 percent of individuals tested with HIV are connected to care within 30 days of diagnosis, according to 2018 CDC monitoring statistics, only 55 to 60 percent of HIV patients (and a lesser percentage of infected adolescents and young adults) achieve persistent viral suppression. The sooner patients are booked for their first clinic visit following a diagnosis; the more probable it is that they will attend that appointment. In one research in Sub-Saharan Africa, beginning ART "immediately" following a positive home test resulted in greater care follow-up. However, in the United States, "rapid" ART start is suggested

within one week of diagnosis (Saag, 2021). In addition, the introduction of HIV self-testing will be an innovative approach that attract groups at high risk of HIV infection and the youth who always do not access the facilities for services due to fear and stigma or discrimination (Parekh *et al*., 2019).

2.3.2 Patients continuity to treatment of HIV and AIDS

2.3.2.1 Use of ART in treatment of HIV and AIDS

Compliance to antiretroviral therapy among HIV patients is key because this treatment improve the quality of life, reduction in morbidities and increase survival. Compliance is one of the greatest problems of the teams involved in the treatment, because it can be influenced by factors related to the physical, physiological and psychological changes brought by the disease and by the treatment. In addition, treatment compliance can also influenced by the patients' personalities, their involvement with the multi-professional health team, and their social interactions (de Souza *et al*., 2019).

The first therapeutic choices have grown more simplified during the previous five years. Considering their efficiency, manageable side effects, and ability to combat the hepatitis B virus (HBV), and stronger barrier to resistance development than other choices, beginning treatment should be confined to dolutegravir with a fixed-dose combination (TDF–FTC or TAF) on the first visit. Once the HIV RNA level, CD4 count, renal, hepatic, HBV, hepatitis C virus (HCV), and HIV genotypic data are available, the regimens may be changed. The therapy might be decreased to a two-drug (dolutegravir–3TC) single tablet, according to the data. In clinical studies, prescribed ART therapy

resulted in virologic suppression that was greater than 90 percent. (Saag *et al*., 2018).

In 2017, 65% of new infections and 75% of fatalities occurred in Sub-Saharan Africa, which is also home to 34% of HIV-positive people in east and southern Africa and 60% of HIV-positive people in west and central Africa who do not receive treatment (Dwyer-lindgren *et al*., 2017). The global community has repeatedly demanded that HIV/AIDS be eliminated. According to Millennium Development Goal 6, "by 2015 HIV/AIDS spread would have been halted and started to reverse."(ECLAC, 2015). A particular deadline of 2030 for the eradication of the illness has been added to SDG 3 (Ensure healthy lives and promote well-being for everyone at all ages; Nations & Programme, (2017). UNAIDS, the Joint United Nations Programme on HIV/AIDS, has defined goals for both diagnosis and treatment (Dwyer-lindgren *et al*., 2017).

2.3.2.2 Follow-up and Retention in Care

Following the start of ART, patients should get follow-up visits every 3 to 4 months until virologic suppression has been reached. Follow-up appointments should be planned every six months when suppression is attained (Saag, 2021). However, retention and follow-up in care has been identified at the forefront in the HIV Care Continuum, where most people living with HIV fail, this is attributed to religious beliefs, Lack of Understanding of ART, Patients' Fear of Disclosing their HIV Status among other can result in difficulty in tension and follow of HIV patients (Modipane *et al*., 2024).

The effect of COVID-19 lockdown on HIV/AIDS treatment

The COVID-19 pandemic had significant influence on global health directly and indirectly, particularly in countries of low- and middle-income, where the effects are determined by a complex humanitarian crisis, weakened health systems, and together with epidemics such as HIV, malaria, and tuberculosis. In some countries, COVID-19 pandemic interrupted HIV testing, care, and treatment services, possibly leading to increased HIV-related deaths and transmission (Forero-peña *et al*., 2024).

The lockdown that started from March 30 to April 19, 2020, disrupted many patients from traveling to the clinic. At one of the largest HIV treatment center in Ghana, part of the clinic was designated for COVID-19 care. There is evidence at the pandemic's peak, were there was low turn up in the number of patients reporting to the hospitals due to emergency conditions such as acute myocardial infarction. Failure to trace follow-ups at the clinic puts PLWH at an increased risk of developing HIV drug resistance, this could increase morbidity and death. Therefore, it is critical to detect patients and provider barriers for clinic follow-up visits during epidemic outbreaks like COVID-19 (Puplampu *et al*., 2025).

However, the emergency of covid-19 which led to lockdown accompanied with acquisition of travel permits from the local councils ones, RDCS and RCCS prevented most of the patient from obtaining their refills due to fear of disclosing their status. This would have been solved by allowing HIV/AIDS patients to use their cards as a confirmation of their health status to the security personnel on the road blocks.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

In this chapter, the materials and methods are described. The study population, design, data sources, sample size estimation are described. Sampling techniques, study variables, data collection tools, data analysis plan, quality assurance strategy, plan for findings dissemination, ethical considerations, and study limitations are explained.

3.2 Study area

The study was conducted at Soroti Regional Referral Hospital in the city of Soroti. The hospital serves the districts of Amuria, Bukedea, Kaberamaido, Kapelebyong, Katakwi, Kumi, Ngora, Serere, and Soroti as a referral hospital (The electives network, 2020). The coordinates of Soroti Regional Referral Hospital are $1^{o}42'58.0"$ N, $33^{o}36'47.0"$ E (Latitudes: 1.716111; Longitude: 33. 613056).

3.3 Study population

The target study population comprised of patients living with HIV/AIDS by the time of the study at Soroti Regional Referral Hospital from November 2019 to June 2021.

3.4 Study design

In this study, a cross-sectional study design was employed to examine the factors that influenced uptake of Anti-Retroviral Therapy (ART) services during the first total lockdown of COVID – 19 Pandemic. The study focused on the months when the facility had not started providing refills for three and six months to patients, distribution of the drugs to other patients using one

client was implemented in 2022. However, patients did not embrace these programmes.

3.5 Data collection methods

The following methods were used to obtain the data for the set objectives:

3.5.1 To examine the influence of demographic factors on the uptake of antiretroviral therapy services by HIV/AIDS patients three month before and during COVID-19 pandemic first total lockdown at Soroti Regional Referral Hospital. Closed ended Questionnaires were used to collect data from the participants who visited the facility in the three months before lockdown and visited again in the first three months of the lockdown. However, the study focused on months before refills of three and six month started

3.5.2 To evaluate the effect of socio-economic factors on the utilization of antiretroviral therapy services by HIV/AIDS patients three month before and during COVID-19 pandemic first total lockdown at Soroti Regional Referral Hospital. Closed ended Questionnaires were used to collect data from the participants who visited the facility in the three months before lockdown and visited again in the first three months of the lockdown.

3.5.3 To determine the proportion of HIV patients who were diagnosed and missed treatment before and during COVID-19 pandemic first total lockdown at Soroti Regional Referral Hospital. Document review was employed to trace the number of people who had been diagnosed and missed treatment for HIV/AIDS. The document review guide

contained questions developed to determine the proportion of patients who had stayed on the treatment plan

3.6 Selection criteria of the participants

3.6.1 Inclusion criteria

Patients who were at the hospital both three month before and three month during first total lockdown of COVID-19.

HIV/AIDS patients included in the book register, given appointment to get refills three months before lockdown and were to get refills again in the first three months COVID-19 lockdown started.

Patients who had given consent to participate

Patients who were 18 years and above

3.6.2 Exclusion criteria

Patients who were in critical condition during the period of study.

Patients not willing to take part in the study.

Patients who had not visited the facility both the last three month to COVID-19 lockdown and first three month during first total lockdown.

3.7 Sample size determination

The sample size for the participants was estimated by using Cochran formulae. By taking in to consideration a study by (UNAIDS, 2021) which showed that 85% of the HIV/AIDS positive adults in Uganda were on antiretroviral treatment, thus the proportion of the patients was P= 0.85.

$$n = \frac{Z^2 pq}{e^2}$$

$$\mathbf{n}= \frac{(1.96)^2{}_{x}\ 0.85\ {}_{x}\ (1-0.85)}{(0.05)^2} = \frac{0.489804}{0.0025} =$$

196 *participants*

Z = 1.96

P= 0.85

E is the level of precision (0.05)

3.8 Sampling techniques

Simple random sampling was used in objective one and two when selecting 196 participants who evaluated the effect of demographic and socioeconomic factors on uptake of Antiretroviral Therapy among HIV/AIDS patients.Simple random sampling technique was also used when comparing the proportion of patients who were diagnosed and missed treatment of HIV/AIDS.

3.9 Data analyses

The responses obtained in the questionnaires were coded, reviewed for completeness, and the data was entered into Microsoft Excel software version 16 then transferred to IBM SPSS statistical software version 20.

3.9.1 Bivariate and multivariate analysis was employed to examine the influence of demographic factors on uptake of Antiretroviral Therapy among HIV/AIDS patients.

3.9.2 To evaluate the effect of socio-economic factors on the utilization of antiretroviral therapy services by HIV/AIDS patients, bivariate and multivariate analysis was used.

3.9.3 To determine the proportion of HIV patients who were diagnosed and missed treatment before and during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital chi-square test was used to show

relationships in the gender and ages. At a 95 percent confidence interval, all findings were based on a significance of $P < 0.05$ and was presented inform of graphs using descriptive statistics and reported as percentages.

3.10 Reliability and validity

The reliability of variables was tested to see consistency of the data and desired result, validated to check the accuracy of the data.

The questionnaire were cross-checked whether the questions would generate data that is required by the study.

3.11 Ethical considerations.

Informed consent was sought by introducing the study to the participants and explaining the research topic to them. Confidentiality was observed by not indicating names of participants; participation in the study was voluntary. However, Research Ethical Committee approval was obtained from Clarke International University and further taken to Uganda National Council for Science and Technology for approval.

CHAPTER FOUR: RESULTS

4.1 Examining the influence of demographic factors on the uptake of antiretroviral therapy services by HIV/AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

4.1.1 Socio demographic characteristic of the participants that influenced uptake of ART

Generally demographic factors significantly influenced the uptake of Antiretroviral therapy services both before (F=29.979, P=0.000) and during lockdown (F= 39.069, P=0.000)

Table 4.1: Socio-demographic characteristics that influenced uptake of ART before and during lockdown

	Demographic	**Anova**		**Bivariate analysis**				
							95% C.I. for OR	
		F	**Sig.**	**SE**	**Sig**	**OR**	**Lower**	**Upper**
Before pandemic	Gender	29.979	**0.000**	.350	.246	.667	.336	1.323
	Age			.137	.115	.806	.616	1.054
	Marital status			.309	.709	1.122	.612	2.058
	Education			.234	**.048***	.629	.397	.996
	Occupation			.118	**.029***	.813	.645	1.024
	Residence			.402	.649	.832	.378	1.832
	Family size			.211	.236	1.285	.849	1.945
	Religion			.156	.328	1.165	.858	1.582
During pandemic	Gender	39.069	**0.000**	.437	**.011***	.498	.211	1.172
	Age			.159	.879	.976	.715	1.332
	Marital status			.369	.901	1.047	.508	2.159
	Education level			.275	.100	.635	.370	1.090
	Occupation			.146	**.012***	.800	.601	1.064
	Residence			.530	.263	1.809	.640	5.108
	Family size			.265	**.023***	1.829	1.087	3.078

UB Upper bound, **LB**: Lower bound, **F**: Anova value, **Sig**: Significant value, **OR**: Odds ratio: * **P < 0.05**

However, individually education (P= 0.48), occupation (P= 0.29) were independently significant with the uptake of ART services before lockdown at the ART clinic whereas during lockdown Gender (P = 0.11) Occupation (P = 0.012), Family size (P = 0.023), were found to be independently significant with the uptake of ART services at the ART clinic.

Table 4.2: Multivariate analysis of factors that influenced uptake of ART services before and during lockdown

The significant variables were further analyzed using multivariate logistic regression for further analysis to identify the specific factors that influenced the uptake of the ART services before and during the pandemic.

	Variable	Categories	Estimate	SE	Sig.	OR	95% C.I. for OR	
							Lower	Upper
Before pandemic	Education	Illiterate	-18.847	1.067	**.000***	6.527E-9	8.055E-10	5.288E-8
		Primary	-19.408	.638	**.000***	3.726E-9	1.067E-9	1.301E-8
		Secondary	-19.026	.614	**.000***	5.458E-9	1.639E-9	1.817E-8
		University	0.	0.	0.	0.	0.	0.
	Occupation	Civil servant	-1.595	1.106	.149	.203	.023	1.772
		Businessman	-1.465	.810	**.007***	.231	.047	1.130
		Employed	-2.073	.995	**.037***	.126	.018	.883
		Unemployed	-.250	1.110	.822	.779	.088	6.861
		Peasant	-1.294	.832	.120	.274	.054	1.399
		Student	0.	0.	0	0	0	0
During pandemic	Gender	Male	.513	.436	**.023***	.598	.255	1.406
		Female	0	0.	0.	0.	0.	0.
	Occupation	Civil servant	-.935	1.382	.499	.393	.026	5.894
		Businessman	-1.656	1.145	.148	.191	.020	1.800
		Employed	-1.444	1.370	.292	.236	.016	3.461
		Unemployed	-.459	1.561	.769	.632	.030	13.458
		Peasant	-1.531	1.138	.179	.216	.023	2.014
		Student	0	0.	0.	0.	0.	0.
	Family size	< 3 people	1.443	.858	**.000***	4.232	.788	22.732
		4 - 5 people	1.834	.573	**.001***	6.261	2.038	19.234
		6 - 8 people	2.061	.568	.093	7.858	2.581	23.919
		> 9 people	0	0.	0.	0.	0.	0.

* **P < 0.05**

Participants who had not attended any education were less likely to take up the ART services than those that had attended university (AOR = 6.527E-9; 95%CI = 8.055E-10 - 5.288E-8), also those that had primary education as their highest level of education were less likely to takeup the ART services than those that had attended university (AOR = 3.726E-9; 95%CI = 1.067E-9 - 1.301E-8), and those that had secondary education as their highest level of education were less likely to takeup the ART services than those that had attended university (AOR = 5.458E-9; 95%CI = 1.639E-9 - 1.817E-8). Being a businessman influenced less on the uptake of the ART services as compared to being a student during the pandemic (AOR = 0.231; 95%CI = 0.047 - 1.130). Being employed was a factor that was seen to reduce the likelihood of up taking ART services as compared to being a student (AOR = 0.126; 95%CI = 0.018 - 0.883). However, during lockdown male participants were less likely to take up ART services as compared to the female participants during the pandemic (AOR = 0.598; 95%CI 0.255 - 1.406). Participants with a family size of less than three people were four times more likely to uptake the ART services as compared to the participants whose families had people more than nine at (AOR = 4.232; 95%CI 0.788 - 22.732). Participants with a family size of 4 to 5 people were six times more likely to uptake the ART services as compared to the participants whose families have more than nine people at (AOR = 6.261; 95%CI 2.038 - 19.234). (Table 4.2)

4.2 Evaluating the effect of socio-economic factors on the utilization of antiretroviral therapy services by HIV/AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

Table 3.3: Socio – economic factors that influenced uptake of ART services before and during lockdown.

Socio economic factors significantly influenced the uptake of Antiretroviral therapy services both before (F = 29.979, P = 0.000) and during lockdown (F = 39.069, P = 0.000).

	Demographic	Anova		Bivariate analysis				
							95% C.I. for OR	
		F	Sig.	SE	Sig	OR	Lower	Upper
Before pandemic	Availability	29.979	**0.000**	.110	**.002***	1.398	1.127	1.735
	Accessibility			.101	.117	.854	.701	1.041
	Acceptability			.094	.241	1.117	.929	1.343
	Affordability			.168	**.012***	1.529	1.100	2.126
During pandemic	Availability	39.069	**0.000**	.094	**.017***	1.138	.946	1.369
	Accessibility			.100	**.028***	.871	.717	1.060
	Acceptability			.093	.579	1.053	.877	1.264
	Affordability			.134	**.012***	1.400	1.077	1.820

* **P < 0.05**

Individually, the availability of ART services (P = 0.002) and affordability (P = 0.012) are factors that were found to be independently significant in influencing ART service utilization before the lockdown. Similarly during the pandemic lockdown, analysis further showed that the availability of ART services (P = 0.17), accessibility of services (P = 0.28), and affordability of services (P = 0.012) were independently significant in affecting ART service utilization.

Table 4.4 Multivariate analysis of socio-economic factors that influenced uptake of ART services before and during lockdown

The significant variables were further analyzed using multivariate logistic regression to identify the specific factors influencing ART service utilization before and during the pandemic.

	Variable	**Categories**	**Estimate**	**SE**	**Sig.**	**OR**	**95% C.I. for OR**	
							Lower	**Upper**
Before pandemic	Availability	Yes	.712	.446	**.011***	2.039	.850	4.886
		No	0.	0.	0	0	0	0
	Affordability	Yes	.264	.507	.602	1.302	.482	3.516
		No	0.	0.	0	0	0	0
During pandemic	Availability	Yes	.635	.380	**.009***	1.886	.895	3.974
		No	0	0.	0.	0.	0.	0.
	Accessibility	Yes	.257	.500	**.038***	2.774	1.290	3.062
		No	0	0.	0.	0.	0.	0.
	Affordability	Yes	.209	.518	.686	1.233	.447	3.402
		No	0	0.	0.	0.	0.	0.

* **P < 0.05**

Reference category is: utilize

The analysis showed that participants who reported that ART services were available were twice as likely to utilize them compared to those who indicated that services were not available (aOR = 2.039; 95% CI = 0.850 - 4.886). Similarly, during the pandemic, multivariate logistic regression was conducted to determine the key influencing factors for ART service utilization. The study found that participants who confirmed the availability of ART services were nearly twice more likely to use them compared to those who reported unavailability (aOR = 1.886; 95% CI = 0.895 - 3.974). Additionally, participants who stated that ART services were accessible were three times more likely to utilize them compared to those who faced accessibility challenges (aOR = 2.774; 95% CI = 1.290 - 3.062) (Table 4.4).

4.2.1 Other socioeconomic factors that influenced uptake of ART services at the hospital before lockdown were noted as below.

Generally majority of the participants attested having no challenge of up taking ART services before lockdown

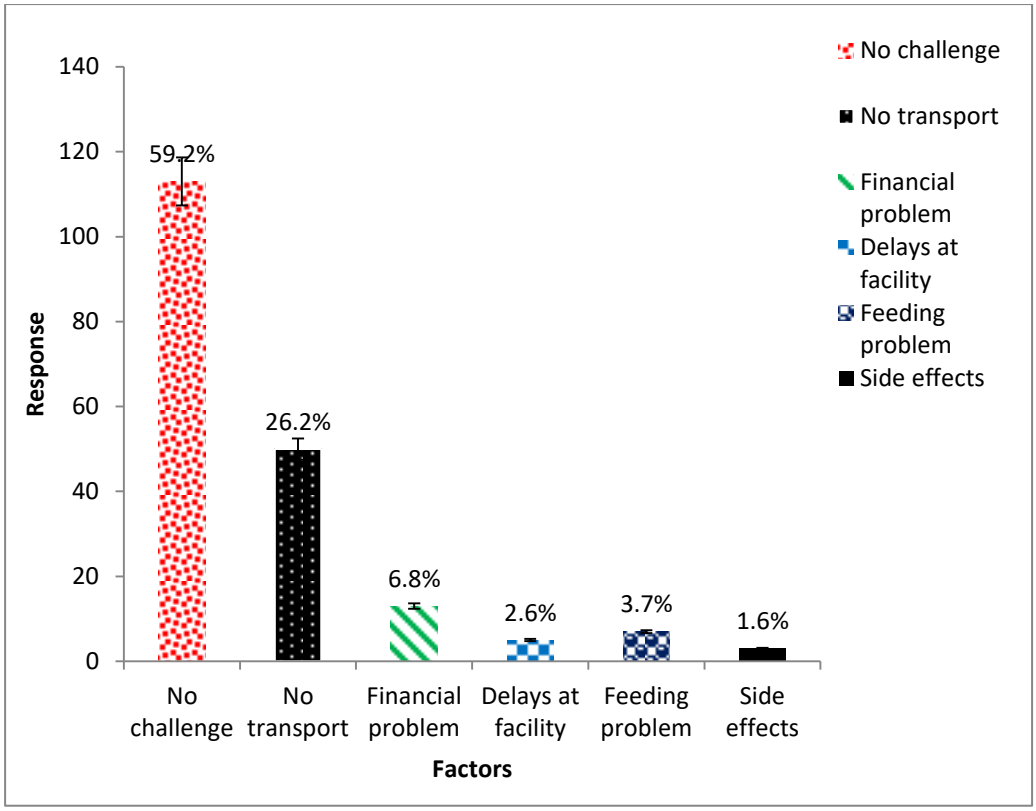

Figure 4.1: Factors that affected uptake of ART medication before first total lockdown

According to participant's responses shown in figure 4.8 above, a majority of the patients represented by 59.2% had no challenge when they sought ART at the hospital before first total lockdown while 26.2% of the patients faced a difficulty of shortage of transport to reach the hospital in order to get ART, 6.8% participants revealed that they had financial problems, 2.6% of the participants attested delays at the facility due to the long waiting hours before acquiring ART, 3.7% of the participants noted inadequacy of food to feed before taking the medication. Only 1.6% of the participants noted having got side effects while taking the ART thus this discouraged them from acquiring medication.

According to figure 4.2 below, majority of the participant in the study responded that they found the challenge of transport has the major obstacle that was hindering uptake of ART services during first total lockdown

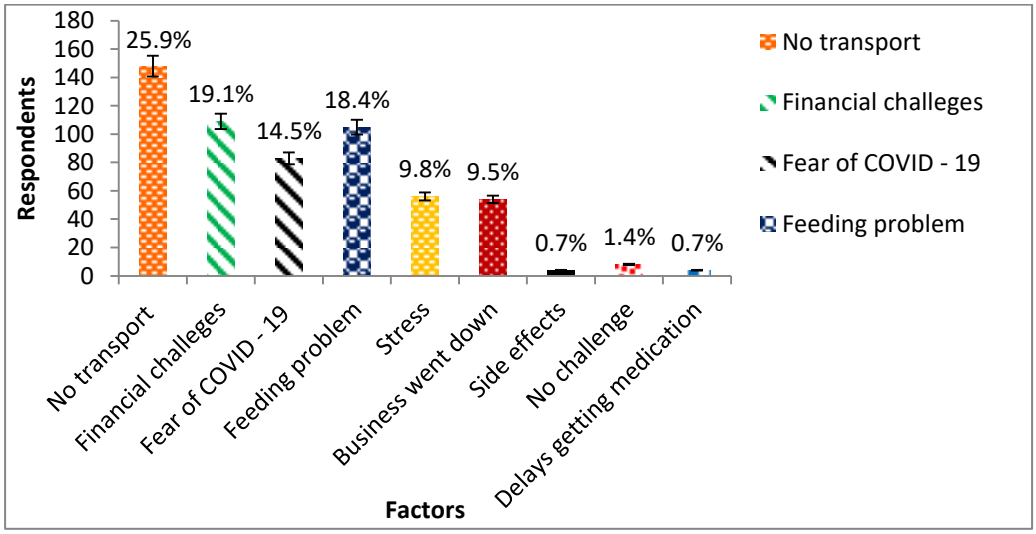

Figure 4.2: Factors that affected uptake of ART medication during first total lockdown

Figure 4.2 above shows that the majority of the patients represented by 25.9% noted that they had a transport challenge to pick ART during the first total lockdown while 19.1% attested that they got a financial challenge, 18.4% of the patients had a feeding problem preventing them from consuming their ART. Due to the fear of acquiring the COVID - 19 virus from the hospital, 14.5% of the patients did not continue with the uptake of the ART, 9.8% of the patients had stress therefore; they could not take their ART in time. 9.5% of the patients attested that their businesses went down during the first total lockdown thus prevented them from consuming their ART. Furthermore, 0.7% of the patients attested that they had side effects and found delays getting medication each thus failure to continue with the ART. However, 1.4% of the patients noted that they had no challenge during the first total lockdown period hence they continued with their treatment.

4.3 Determining the proportion of HIV patients who were diagnosed and missed treatment before and during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

4.3.1 Proportion of HIV patients who were diagnosed before and during COVID – 19 pandemic lockdown at Soroti regional referral hospital

The study showed, that the highest number of the participant that tested for HIV and AIDS both before and during the lockdown period were females.

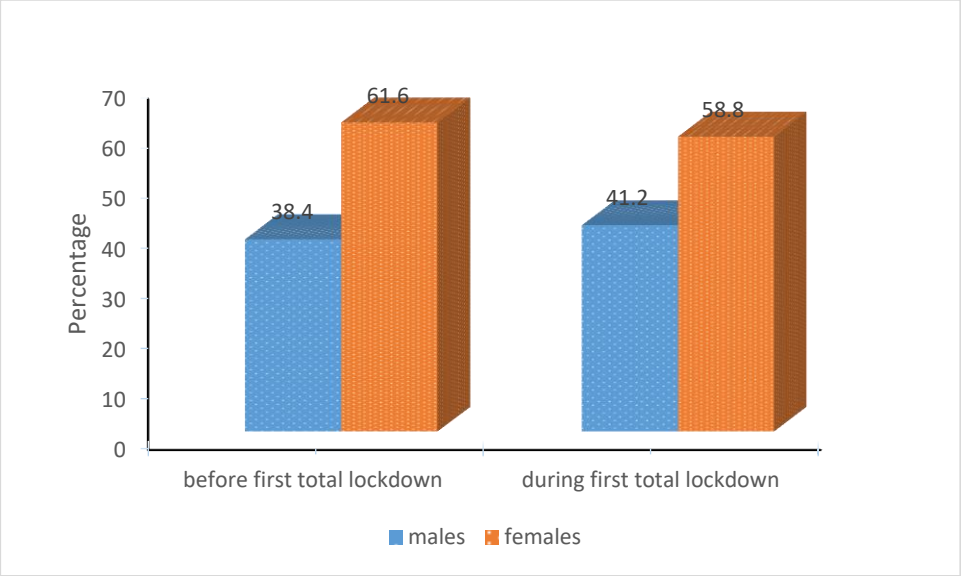

Figure 2.3: Percentage of gender who were tested for HIV/AIDS before and during first total lockdown

Figure 4.3 above shows that before first total lockdown of COVID-19 the highest percentage of the people who went for testing were females with 61.6% (n=2025) whereas males were 38.4% (n=1262) and there was significant difference in the percentage of females and males who tested (x^2 = 5.089; $p < 0.01$). However, during first total lockdown females still recorded the highest rate of tests conducted at 58.8% (n= 1761) compared to their male

counterparts at 41.2% (n= 1233) and there was a significant difference (x^2 = 4.973; P < 0.01).

Generally, the results below show that age groups between 21-30 and 31- 40 had the highest number of tests conducted compared to other age groups.

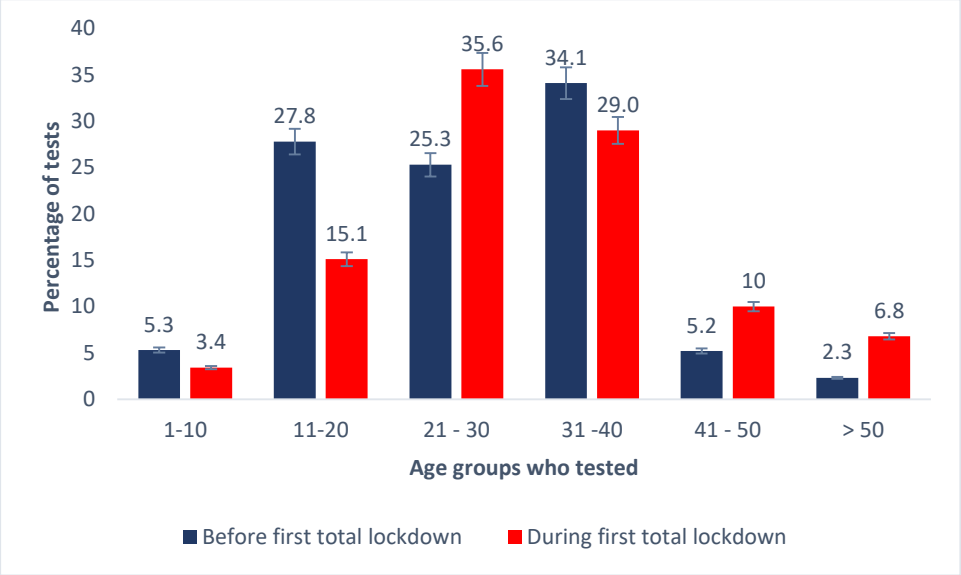

Figure 4.4: Percentage of Age groups who were tested for HIV and AIDS before and during first total lockdown

Figure 4.4 above shows that before first total lockdown of COVID-19 age group from 31-40 years had the highest rates of tests at 34.1% (n = 1121), followed by age group from 11-20 years at 27.8% (n=913), age group from 21-30 years had 25.3% (n=832), age group from 1-10 years had 5.3 (n=173), age group 41-50 years was represented with 5.2% (n=171) and finally the age group greater than 50 years had the least test at 2.3% (n=77), this showed a significant difference (x^2 =312.222; P < 0.01). However, during the first total lockdown of COVID-19 age group from 21-30 years recorded the highest potion of the tests done with 35.6% (n=1067), followed by age group 31-40

years with 29.0% (n= 869), age group from 11-20 years had 15.1% (n=453), age group 41-50 years had 10.0% (n= 299) of the tests, age group > 50 followed with 6.8% (n= 203) and lastly age group 1-10 had 3.4% (n= 103) at a significant difference ($x^2 = 317.495$; $P < 0.01$).

4.3.2 Determining the proportion of HIV patients who missed appointment, by number, gender and age before and during COVID-19 lockdown at Soroti Regional Referral Hospital.

Generally, the month of February had the highest number of the appointments before lockdown while during lockdown the appointment was relatively distributed equally in the three month

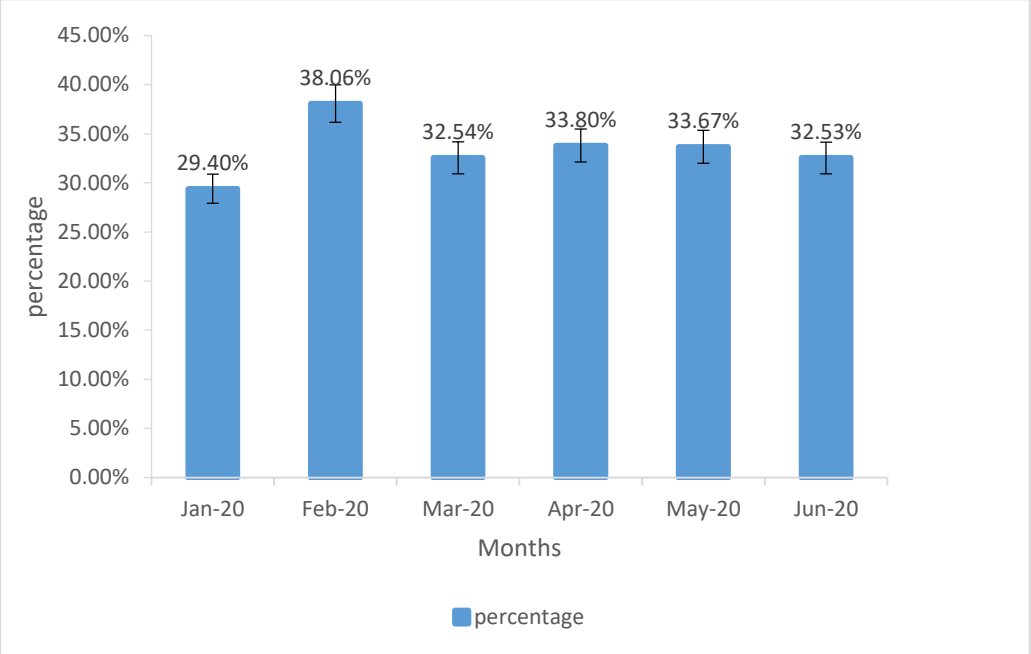

Figure 4.5: Percentage of patients with appointments for treatment in specific months before and during first total lockdown

Figure 4.5 above shows that before first total lockdown 38.06% of patients had appointments for HIV and AIDS treatment in the months of February 2020, while 32.54% had to get treatment in March 2020. The month of

January 2020 had the least appointments to get treatment on HIV and AIDS with only 29.40% of the patients. However, during first total lockdown 33.8% of the patients had the appointment to visit the hospital for the treatment while 33.67% of the patients were to receive the treatment in the month of May 2020 and 32.53% were to report for treatment in the month of June 2020.

According to figure 4.6 below the month of April registered the highest number of patients that missed appointments

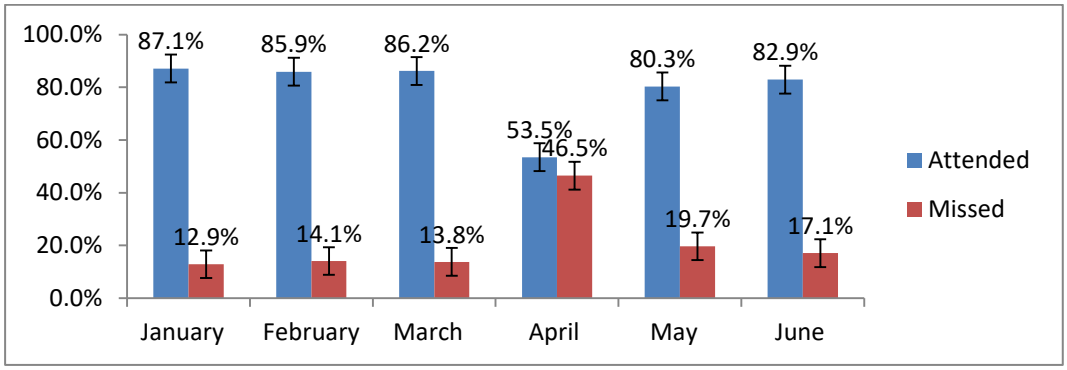

Figure 4.6: Percentage of patients with HIV/AIDS who missed the treatment per month

According to figure 4.6 above, patients who missed the appointment at the facility were 12.86% in January 2020, this increased slightly to 14.14% in February 2020, then the missed appointments reduced to 13.77% in March 2020. There was a sharp increase in the month of April 2020 to 46.65%. However, there was a decline in patients who missed appointments in May to 19.7% and 17.09% in June 2020.

Generally, the number of females who missed the appointments higher than the number of males throughout the months of the study

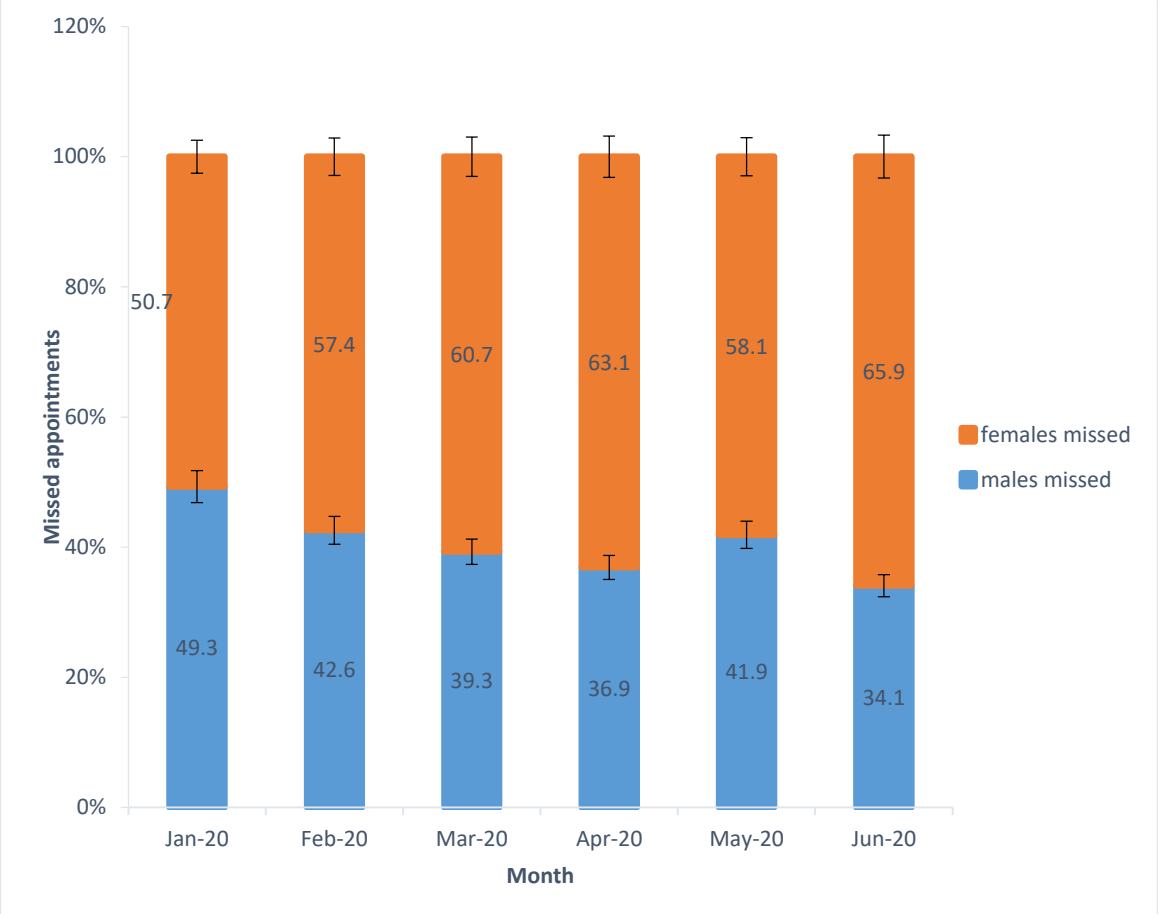

Figure 4.7: Monthly trends of patients that missed treatment by gender

Figure 4.7 showed that before total lockdown the patients who missed appointment in the month of January 2020 were 50.7% females and 49.3% males. In February 2020 57.4% were females while 42.6% were males who missed appointment. The females who missed appointments increased in the months of March with 60.7% of the females missing appointment, 39.3% were males that missed and the significance difference of (x^2=45.300; p= 0.019) while during the first total lockdown in the month of April 63.1% of the females missed the appointments against 36.9% of the males. In the month of May females had a slight decline of missed appointment to 58.1% while males slightly increased to 41.9%. However, missed appointments dramatically increased in June 2020 with 65.9% of the females and 34.1% of males with significant difference at (x^2= 53.815; p= 0.038).

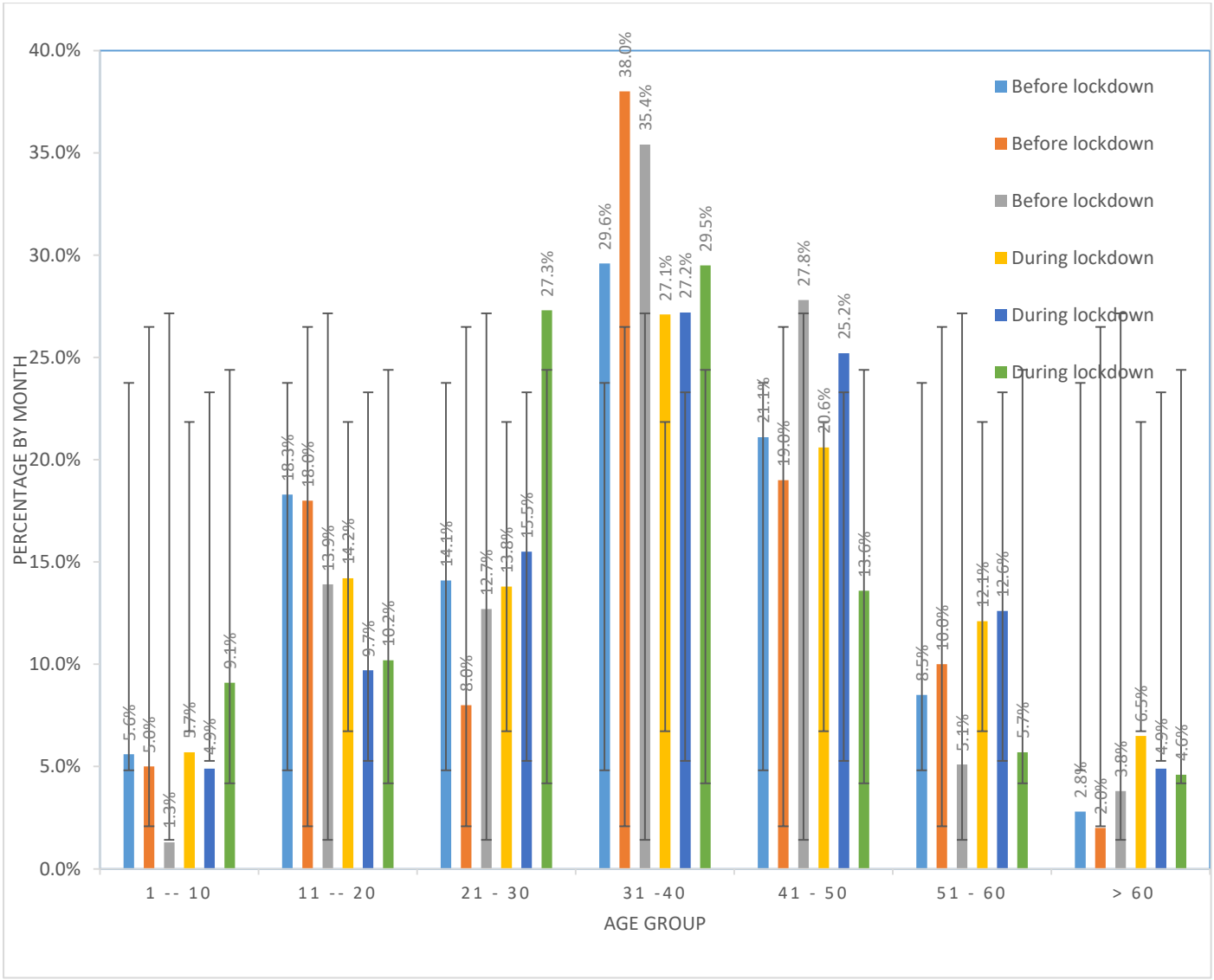
40.0%
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
PERCENTAGE BY MONTH
Before lockdown
Before lockdown
Before lockdown
During lockdown
During lockdown
During lockdown
5.6%
5.0%
1.3%
9.7%
4.9%
9.1%
18.3%
18.0%
13.9%
14.2%
9.7%
10.2%
14.1%
8.0%
12.7%
13.8%
15.5%
27.3%
29.6%
38.0%
35.4%
27.1%
27.2%
29.5%
21.1%
19.0%
27.8%
20.6%
25.2%
13.6%
8.5%
10.0%
5.1%
12.1%
12.6%
5.7%
2.8%
2.0%
3.8%
6.5%
4.9%
4.6%
1 -- 10
11 -- 20
21 - 30
31 -40
41 - 50
51 - 60
> 60
AGE GROUP

Figure 4.8: Percentage of patients who missed treatment of HIV/AIDS by age

Figure 4.8 above showed that the percentage of the age groups that missed treatment before and during first total lockdown. In January 2020 before first total lockdown, the patients who missed treatment were as follows 29.6% were of age group between 31-40 years, 21.1% were of the age group of 41-50year, 18.3% were of the age group between 11-20 years, 14.1% were between the age group 21-30 years, 8.5% were of the age group 51-60 years, 5.6% were of the age group between 1-10 years, 1.4% were of the age between 61-70 and >80 years each.

The month of February 2020 before the first total lockdown showed patients who missed treatment aged between 31-40 years were 38.0%, followed by the 41-50 years at 19.0%, 11-20 years had 18% of those that missed the treatment. Other age groups that missed treatment during the month of February, 2020 were, 51-60 years at 10%, 21-30 years at 8%, 1-10 years at 5%, 61-70 and >80 years at 1.0% each.

In the month of March 2020, 35.4% of the patients who missed treatment were between the age group of 31-40 years, 27.8% in the age group from 41-50 years, the age group between 11-20 years had 13.9% while age group between 21-30 had 12.7%. The other age groups that missed treatment in March 2020 were 51-60 years had 5.1%, 71-80 years had 2.5 %, 1-10 years and 61-70 years had 1.3% each. However, the significance difference of patients who missed the appointment before first total lockdown was (x^2=305.114; p=0.041)

Nonetheless, during the first total lockdown in the month of April 2020, 27.1% of the patients who missed treatment were of the age bracket of 31-40

years followed by the age bracket 41-50 years with 20.6%, 11-20 years with 14.2%, 21-30 years with 13.8%, 51-60 years with 12.1%, 1-10 years with 5.7%, 61-70 years with 4.9% and finally age bracket between 71-80 years had 1.6 % of the patients that missed treatment.

In the month of May 2020, age group 31-40 years had the highest cases of 27.2% patients who missed treatment with, followed by 41-50 years at 25.2%, 21-30 years at 15.5%, 51-60 years at 12.6%, 11-20 years at 9.7%, 1-10 years at 4.9%, 61-70 years at 2.9% and finally age group 71-80 and >80 years had both 1% of the patients that missed treatment.

Finally, in the month of June 2020, age group 31-40 years had the highest cases of patients who missed treatment with 29.5% followed 21-30 years with 27.3%, in addition 41-50 years followed with 13.6%, 10.2% was for age group 11-20 years, 9.1% of the patients were of the age group 1-10 years, 5.7% were in the age bracket of 51-60 years and finally 4.6% belonged to the age bracket of 61-70 years.

CHAPTER FIVE: DISCUSSION

5.1 Examining the influence of demographic factors on the uptake of antiretroviral therapy services by HIV/AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

5.1.1 Gender of the participants

Participants in the study were majorly males with 51.4%, this was because most men were not hesitant and had no fear to participate in the study compared to women who rejected being part of the study citing time wasting since they had a lot of activities back in their families and also had fear discussing or answering some matters in the questionnaire. The results of the study were in agreement with a study by Cauldbeck *et al*., (2009) who showed that 53.8% of the participants were males, though at a low count, however the study was not in line with other studies by Arage *et al*., (2014); Basti *et al*., (2017); Nanyonjo *et al*., (2020); Ndiaye *et al*., (2013) which showed majority of the respondents being females.

Gender of the participants did not influence uptake of ART services before the pandemic. However, gender was found to influence the utilization of ART services during the pandemic where by the odds of the males using the ART services during the pandemic were reduced. This was so mainly because during the pandemic the women more so those who were pregnant were allowed to travel to the health facilities though through several restrictions while the male patients were not having access to the facilities.

5.1.2 Level of education of the participants

Majority of the participants had attained the primary level of education. This is because most of the participants stayed in rural settings where education is not prioritized in respect to other activities for example agriculture, fishing to mention but a few.

The level of education of the participants influenced the uptake of ART services before the pandemic where by those that were less educated were less likely to utilize the ART services, however education level had no influence to the uptake of ART services during the pandemic. This was so because before the pandemic the patients never had proper sensitization on the diagnosis and the treatment of HIV and AIDS thus those who were less educated didn't see it necessary to go for the services as most of the patients in Africa tend to resort to herbal medicine for the cure of the virus and this was consistent with the studies from (Dorcélus et al., 2021) who stated that despite the limited resources and basic needs, access to education is seen to potentially improve on the adherences to ART because educated people tend to reflect on the future consequences of non-adherence compared to less educated people. During the pandemic, the influence of the ministry of health on the effect of Covid-19 virus on the already vulnerable persons including people with HIV/AIDS created awareness and the need to access the facilities for the available services even for the least educated.

5.1.3 Family sizes of the participants

The participants who had a family size of 4 – 5 people were more dominant in the study. This was because families with people ranging from 4 – 5 are

families of youth or people below 40 years. . The family size of the participants did not affect the utilization of ART services before the pandemic but however it was found to affect the utilization of ART services during the pandemic where by the participants with smaller family sizes (< 5 people) were more likely to use services than those with bigger families (> 9 people). This is mainly because family size determines the expenditure and the usage of resources, therefore family sizes with few member were able to allocate finances toward transport which was hiked and other related HIV/AIDS treatment for example tuberculosis check-ups among others compared to families with larger sizes whose finances are used majorly on food, education and medication of other family members during lockdown were most patients had lost their jobs. This was supported by the study which stated that addition in the number of family members by one person resulted in a lower likelihood of adherence on ART of the orphans and vulnerable children living with HIV (OVCLHIV) over the follow-up period by 22%. It is likely that the bigger the family (for reasons such as multiple orphans and vulnerable children cared for by the same caregiver), the higher the economic hardship to the caregiver, hence, poor retention as discussed above (Charles *et al*., 2022).

5.2 Evaluating the effect of socio-economic factors on the utilization of antiretroviral therapy services by HIV and AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

5.2.1 Effect of availability of services provided at the ART clinic on uptake of ART.

Availability of HIV/AIDS services comprises of counselling, TB, ARV, Wards, PMCT services at the facility. These are the key components of

availability since they are major activities that are done at the ART clinic. Nonetheless availability of ART services influenced the uptake of services at the ART clinic both before and during the pandemic. Participants agreed that services were available both before and during the pandemic. This was so because before the pandemic tuberculosis screening was easy to obtain while under lockdown it was challenging since COVID-19 also presented the similar signs and symptoms of cough which made it impossible to distinguish between the two hence making patients and health workers to fear handling patients with such cases. This finding are in line with the study done by (Semitala *et al.,* 2023), patients feared to visit or being admitted at the hospital due increasing numbers of Covid-19 cases that were being recorded daily at the hospital, PMTCT services too were disrupted and pregnant women who attended were not tested as stated also by a study Bisnauth *et al*., (2022) that majority of the mothers went undiagnosed for HIV and gave birth in hospitals without receiving early PMTCT assistance during the Covid-19 phase and patients were prohibited from spending more time at the facility, so they mostly visited to pick medication only.

Counselling is the first help specialists give to both people testing for HIV/AIDS and those on medications because it helps the individual to cope up with the disease and its consequences. Counselling services according to participants was excellent before first total lockdown however, it showed no significant effect on uptake of ART because most patients who visited the ART clinic were not bothered to have counselling sessions since they had no issues for example stress, fear and side effects among others that necessitated counselling. Meanwhile during first total lockdown of Covid-19 HIV/AIDS

counselling was poor because of the interruption by Covid-19, this was noted by the participants in the study and it significantly did not have any effect on adherence to ART treatment, this was also attributed to fear among patients and health workers especially when the patient had Covid-19 symptom of flu and cough. Also patients had limited time they spent with the medical personnel so they could not get better explanations of the problems they face Bukenya *et al*., (2022) who claimed that patients said HIV care, which includes post-test counselling, ART initiation, medication refills, and adherence counselling, was identical across all participating health institutions, however, he further stated that there was shortage of drugs for chronic diseases for example diabetes and hypertension. Another study stated that patient defaulted because she was not educated about adherence and she didn't know that she was supposed to get treatment after becoming pregnant (Adeniyi *et al*., 2018).

Tuberculosis service also had no significant effect on uptake of ART treatment both before and during first total lockdown because most of the patients who visited the ART clinic were not sick of TB despite them being TB free, they approved of the service at the facility, however, screening for tuberculosis during lockdown was challenging since COVID-19 sometimes present similar symptoms as TB making it impossible to distinguish between the two (Semitala *et al.*, 2023).

Antiretroviral (ARV) services was not significant before first total lockdown because patients had different assumptions about acquisition of ARV however, ARV services was significant and its acquisition improved during first total lockdown as shown in the study because patients were prohibited from

spending more time at the facility, so they mostly visited to pick medication only. However, the facilities also started providing ART refills for three months to avoid monthly visitation of the facility, this was also consistence with the study done by Izudi *et al.*, (2022), who mentioned that patients who made it to the facility, were given long refill because it was not known how long the pandemic would take. Patients were therefore offered refills for at least three months, which would allow them enough time to avoid the discomfort of unnecessarily returning every month or after two months.

State of the wards at the hospital was significant before first total lockdown because most of the patients willing accepted to be admitted in the wards in case of any complication. During lockdown patients feared to visit or being admitted at the hospital due increasing numbers of Covid-19 cases that were being recorded daily at the hospital. Prevention of mother to child transmission (PMTCT) was not significant both before and during first total lockdown, this was due high numbers of males visiting the facility compared females and also very few women visited the facility while pregnant so participants could not evaluate the effectiveness of the service at the facility. Since covid-19 disrupted services at the facility PMTCT services too were disrupted and pregnant women who attended were not tested has stated in a study by Bisnauth *et al*., (2022), who said women frequently went undiagnosed for HIV and gave birth in hospitals without receiving early PMTCT assistance during the Covid-19 period.

5.2.2 Effect of accessibility of the patients to the facilities in the hospital

Accessibility is one of the core values to uptake of ART. It comprises of various factors a mong others ease of access, waiting time at the facility, accessibility of the doctor, distance to the facility, appropriate means of transportation to the ART clinic, the times the patient visited the hospital before and during first total lockdown.

According to the study it was determined that accessibility to ART services did not influence the uptake of ART services before the pandemic but however it was found to influence the uptake of ART services during the pandemic where by those that agreed with services being accessible were more likely to take up the ART services.

This was so mainly because during the pandemic the people were not allowed to travel due to the total lockdown therefore, they did not manage to reach the facility or even receive the refills at their homes therefore those that got the opportunity to access the services like the pregnant mothers who were given a waiver to travel at some point during the pandemic took up the services effectively.

Other factors that could have affected use of services were washing of the hands at all times, wearing the mask which participants testified was a challenge since most of them used to forget their masks at home hence being denied entry to the facility, a number of participants had no means of transport to the facility and also had financial challenges.

This however, is in accordance to a study done by SEBIO, (2010); who reported that 36% and 34.6% of the participants identified lack of financial

resources to cover transportation costs and significant distances as obstacles to keeping follow-up appointments as problems, Hansana *et al*., (2013), sited lack of money to travel to the health centre (32.6%) and long distance to the health center from the home of the participants at 27.9% as the problems that affected accessibility to the facility.

Furthermore, before first total lockdown most of the patients used motorcycles commonly known as bodaboda to get their ART refills, this was the fastest and cheaper means of transport which was favourable for the patients but due to restrictions on transport during first total lockdown, most of the people opted to walk on foot and also use bicycles to reach the facility.

In addition, most of the participants who used motorcycles testified that the charges were high and also stopped about 3 kilometres away from the facility hence completing their journey to the facility on foot in order to beat the security. The total number of visits to the facility for medication also deviated since this was the period changes were started on dispensing from monthly to 3 months or 6 months to avoid overcrowding at the facility, so the number of participants that visited once increased. This was in agreement with the study done by (Migisha *et al*., 2020) who said that transport to facilities for medication top-ups was another factor for missing ART dosages.

5.2.3 Other socio economic factors that influenced uptake of ART at the hospital.

5.2.3.1 Transport constrains affecting uptake of ART treatment

Failure to access means of transport to ART clinic to acquire drugs was a hindrance before and during first total lockdown of COVID-19 pandemic, but

this was more tragic during the first total lockdown of COVID -19 whereby all public and private vehicles were banned from moving including people's movements were restricted and advised to stay home except for the essential workers and cargo trucks.

However, this was also coupled with the struggle to get permission from the Residence Districts Commissioners (RDCs), Residence City Commissioners (RCCs) and Local council leaders to go and seek for medication (Zakumumpa *et al*., 2021). Furthermore, some people feared to expose their HIV and AIDS status to their local leaders, which they thought could expose them to more stress and stigma hence opting to move without travel permits (letters).

This led a number of patients to encounter constraints for example using motorcycles for some distance and then complete the journey on foot to beat the tight security that was manned all over the highways and the streets, some patients lost their possessions including motorcycles when trying to access the health facility for medication, they were arrested and their motorcycles impounded at the police stations and some could not pay the required amount to get back their motorcycles.

In addition, patients had to use large sums of money in order to be transported for a short distance compared to normal days when there was no lockdown in order to access their medication, this made most of the patients to miss appointments as supported with a study done by Zakumumpa *et al*., (2021), who stated that Uganda's lockdown measures had an influence on HIV care, including access to ART top-ups for the country's 1.2 million antiretroviral medication (ART) patients.

5.2.3.2 Financial challenges affecting uptake of ART medication

Financial challenges hindered most patients during first total lockdown from accessing medication as found by the findings of the study, where 6.8% (N=13) of patients had financial challenges before first total lockdown compared to 19.1% (N=109) of patients during first total lockdown, this was because most patients could not do businesses evidenced by the closure of the weekly markets which many participants used to engage in to carry out business activities in order to get income to sustain their families, only shops and markets selling food stuffs were allowed to operate, this made other entities were patients could get income to be closed thus leading to non-adherence to medication because they could not get transport money to the health facility.

Financial problems also hindered the patients from consuming their ARV as required both before and during first total lockdown of COVID – 19 pandemic since they could only manage to eat once a day due to financial shortage, this was supported by a study (Adeniyi *et al*., 2018). Adeniyi *et al*., (2018) stated that patients stopped taking their medication mainly because they had no money to buy food. This affects their CD4 count in the body. The expense of transportation to receive ARVs was cited as a cause of non-adherence, even in the case of free medications. This was also seen in different studies, according to Palattiyil *et al*., (2022), non-adherence was also attributed to inability to afford medications and the intension to sell one's own medications in order to get funds for other needs. Another cause for non-adherence to treatment is that patients in developing nations are required to contribute to the expense of their anti-retroviral therapy (Pillai *et al*., 2019).

In environments with low resources, fees for treatment are common, and during the past 15 years, the World Bank has endorsed some kind of user fee payment of health care as the norm. A research from Nigeria that tracked the adherence of 53 patients (of whom 40 received free medicine and 13 paid for their treatment) discovered a tendency towards improved adherence in those who received free care; this finding was not statistically significant. One of the most typical excuses for non-adherence has been financial constraints (Uzochukwu *et al*., 2009). It has been proposed that free HIV treatment be made available in underdeveloped nations to boost adherence rates (Achappa *et al*., 2013).

5.2.3.3 Feeding challenge affecting uptake of patients to ART treatment

Feeding well is one of the requirements for people on ART medication because it's a means of boosting their immunity. Eating nutritious diets (well-balanced diets) helps the patients regain their immunity.

However according to the study, participants had challenges of feeding before first total lockdown at Soroti Referral Hospital and the number of those who had a challenge of obtaining what to eat for a day increased during first total lockdown. However, this was due to closure of weekly markets and transport.

Participants affirmed that their businesses collapsed as a result of the first total lockdown and led to challenges since their businesses were their source of earning which in turn provided food. Others could not transport their food stuffs to the markets in town and also they had fear of sending other people who would end up stealing them. This is reliable with a study by Castleman *et al*., (2017) who gave an insight on how various medications are taken.

Most medications demand patients to have a meal few minutes before or after taking the medicine, this was a challenge according to this study which found out that most patients had one meal a day mostly in the evening and yet they take their medication in the morning.

Furthermore, participants testified taking the medication on an empty stomach which is not medically recommended for some medications, this led to side effects like allergies, others could not follow the prescription rule of the ART treatment due to fear of the side effect when they take the medicine without eating anything, this is in line with a study by Ali *et al*., (2021), who documented that inadequate amount of food affected the lifestyle of Participants. However, some participants also said that food was available, but their biggest problem was that they could not afford food.

5.2.3.4 Side effects of the medication affecting uptake of ART

The findings point out side effects as one of the factors that influenced uptake of ART treatment among patients at Soroti Regional Referral Hospital both before and during first total lockdown. This was attributed to first reaction to the treatment and also shortage of basic needs for example food.

Other studies around the world are also consistent with this study stating that continuous uptake of ART may develop severe adverse effects mostly explained by mitochondrial toxicities (Nansseu & Bigna, 2017). Because side effects are widespread, especially in the early stages of therapy, and have the potential to significantly lower quality of life, they were the most frequent reason of non-adherence to medication (Renju *et al*., 2017).

It is conceivable that participants in the research had experiences of adverse effects or were conscious of the likelihood of side effects and therefore reported it. According to Uzochukwu *et al*., (2009) 24% of patients gave the desire to prevent side effects as a reason for not taking their medicine as directed, this also applied to this study both before and during the first total lockdown.

However, according to the World Health Organisation, issues with side effects such as toxicity, intolerance, and drug-drug combinations might hinder the success of treatment regimens, particularly in poor and medium income countries (WHO, 2008). Even though patients are willing to forego side effects if they believe their condition to be life-threatening, it is still crucial that medical professionals aid patients in sticking with their treatment through proper support and routine side effect management, including counselling about potential side effects and where and how to seek care when they do. Health professionals should emphasise that the advantages of routinely taking the medications outweigh the disadvantages.

5.3 Determining the proportion of HIV patients who were diagnosed and missed treatment before and during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

5.3.1 Proportion of HIV patients who were diagnosed before and during COVID-19 pandemic lockdown.

5.3.1.1 Gender of patients diagnosed for HIV/AIDS before and during the first total lockdown

HIV testing serves as a starting point for identifying and admitting HIV-positive individuals to care. The study showed that before first total lockdown of COVID-19 the number of people who were seeking testing services at Soroti Referral Hospital were high and the females had more tests compared to males in this period, this was attributed to free movement of people to different destinations with ease, so many could easily reach the facility to test more so the expectant mother who have mandatory testing when they visit the hospital for antenatal services. This finding is in line with the finding from Almirol *et al*., (2018) who also determined that more women were diagnosed for HIV/AIDS than men through routine health care-based testing program.

However, during first total lockdown the rate of people seeking testing services at the facility reduced compared to the period before first total lockdown and this was due to strict restriction given by the government which involved prohibiting people from gathering and travel ban on both public and private transport among others prevented people from testing for HIV.

It was also coupled with fear regarding Covid-19 from both health workers and the people intending to test and the way most countries especially China

were registering high numbers of incidences per day in the month of March. This made most of the people to shy away from testing at formal health care facility since the hospital was the focal point for preparation of Covid-19 treatment in the sub region. This was also documented by (Ponticiello *et al*., 2020); Lagat *et al*., (2020), who reported that participants cited travel restrictions and business closures as major obstacles to obtaining volunteer HIV testing services.

This result is also in agreement with research by Medina *et al.*, (2021) and Mhango *et al*., (2020), who found that the COVID-19 pandemic had an influence on HIV healthcare services, most especially in referral healthcare facilities, where HIV diagnosis fell by 54.7% (95% CI 53.8-55.4%) during the period of total COVID-19 lockdown.

5.3.1.2 Ages group of patients who diagnosed for HIV and AIDS three month before and during first total lockdown

Age was seen to be significant to acquisition of HIV/AIDS testing services at the facility, the study showed that the younger the person the more chances they are to test for HIV/AIDS virus. The study further showed that persons with younger ages who are at child bearing age participated more in testing for HIV/AIDS than the persons with older ages who are reaching menopause or have already reached menopause for females.

It is also attributed to younger persons being actively involved in to unprotected sexual intercourse with one or more partners and in turn go for HIV/AIDS test to know their status, also high percentage of young people testing is attributed to mandatory test for HIV/AIDS given to both females and

husbands who visit the facility seeking for antenatal services at the facility. This is in agreement with the study done by Vithalani & Herreros-Villanueva, (2018) who also found out that majority of the people who tested were young and were between the age of 18-30 and 31- 40 years, this was because this groups are sexually active and always had risky sex behaviours for example have unprotected sex.

This study is also consistent with another study that stated that young people between the age 15 to 24 years are believed to account for over half of new HIV infections, and up to a third of HIV/AIDS patients are below the age of 25 (Nanyonjo *et al*., 2020).

5.3.2 Determining the proportion of HIV patients that missed treatment before and during COVID-19 lockdown at Soroti Regional Referral Hospital.

The study findings showed that the adherence rate before the first total lockdown was at 86.35%, this was due to free movement, better counselling sessions at the facility, availability of the medicines, easy access to the facility as well as medical persons and cheap means of transport and. However, patients declared spending less money for transport to the health facility, they reached the facility and spent enough time with health workers as well getting better counselling sessions, this made most of them not to forget the appointment days as compared to the period during the first total lockdown were there was a decrease in adherence rate and acquisition of treatment by patients who had appointments to 72.02% during the first total lockdown, this was a result of lack of transport to the facility and also cost of transport which doubled causing access to the facility difficult for the patients. This study is in

agreement with a similar study from Ethiopia that was done by Azmeraw & Wasie., (2012), who found the adherence rate at 86.9% and this was due to strict counselling sessions before starting ART treatment. A systematic analysis of paediatric ART adherence studies by Vreeman *et al*., (2008) in middle- and low-income countries supports this conclusion as well, it showed 75% of adherence and this was due to family structure, disclosure, socioeconomic status and medication regimen. Nevertheless, it was higher than studies done by Cauldbeck *et al*., (2009) which showed adherence rate of 60.4% and this was caused by drug stock out from the patients and distance to the clinics where they get medication from, it was estimated to be 250 km or more from the clinic.

5.3.2.1 Gender of the patients that missed treatment three month before and during first total lockdown

According to the findings in the study, gender was associated with missing of treatment. The study also interestingly given the fact that the females prefer to go for testing than their male counterparts, however, on acquisition and following appointments for treatment, females had the highest number of missed appointments than the males throughout the 6 months. This was evidenced by the increasing number of missed appointments by the female which can be attributed to strict restrictions that were governing movement during the period of the first total lockdown, increased transport fares and fear of contracting Covid-19. The adherence rates in males were greater than in females, which contradicted a research by Basti *et al*., (2017) who found that

female adherence rates were higher than male adherence rates, they were not statistically significant at (χ^2 = 3.429, P = 0.064).

5.3.2.2 Age of the patients that missed treatment three month before and during first total lockdown

The study also showed that age was a factor that enhanced the missing of the appointments both before and during first total lockdown of COVID 19. It showed that the older patients were prone to missing their appointment than the younger patients as signified with the high rate of missing treatment by the patients who were 31 – 40 years and 41 – 50 years throughout the 6 months of the study. This was due to difficulty in footing or riding bicycles to the health facility to obtain medication since this was the cheapest and safe means of transport.

This result differed from the study done by Cauldbeck *et al*., (2009), who found that older patients tended to adhere to their treatment regimens better but that this association was not significant at (p = 0.325). They suggested that this difference may have been due to older patients' being familiar with treatment and growing consciousness of HIV as a condition that necessitates optimum adherence (Cauldbeck *et al*., 2009).

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATION

6.1 Examining the influence of demographic factors on the uptake of antiretroviral therapy services by HIV and AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

Conclusion

This study examined the factors influencing the uptake of ART treatment at Soroti Regional Referral Hospital during the COVID19 pandemic. Findings revealed that gender, education level, family size, and religious beliefs influenced ART uptake differently before and during the pandemic. While gender did not affect ART uptake before the pandemic, men were less likely to access ART services during the lockdown due to travel restrictions favoring pregnant women. Education level influenced ART uptake before the pandemic, with less educated individuals being less likely to seek treatment due to limited awareness. However, during the pandemic, education level had no significant effect, as sensitization efforts by the Ministry of Health improved awareness across all education levels. Family size played a critical role in ART uptake during the pandemic, with smaller families (<5 members) being more likely to access ART services than larger families (>9 members), mainly due to financial constraints.

Recommendations

The Ministry of Health should develop strategies to enhance ART uptake among men, including targeted awareness campaigns addressing stigma and gender specific barriers to treatment.

Health facilities should adopt flexible service delivery models, such as community based ART refills and home delivery options, to improve access for men.

Continuous HIV education campaigns should be intensified, especially in rural areas, to ensure that individuals with lower education levels understand the importance of ART adherence.

Community health workers should engage in door to door sensitization programs to counter misinformation and encourage ART uptake.

The government and stakeholders should introduce financial support mechanisms, such as transport subsidies for ART patients, especially for those from low income households.

Decentralized ART distribution points should be established in rural health centers to minimize transportation costs for patients.

Faith based organizations should be involved in HIV/AIDS awareness programs to promote positive messaging about ART adherence in church summons.

Partnerships with religious leaders should be strengthened to counter misconceptions about faith healing and emphasize the importance of medical treatment.

Health policymakers should develop contingency plans to ensure the continuous supply and accessibility of ART services during public health emergencies.

6.2 Evaluating the effect of socio-economic factors on the utilization of antiretroviral therapy services by HIV/AIDS patients during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

Conclusion

The availability of HIV/AIDS services, including counseling, TB screening, ARV provision, ward admissions, and PMTCT services, plays an important role in the uptake of ART services. The study revealed that while these services were accessible both before and during the COVID19 pandemic, their utilization was significantly influenced by pandemic related disruptions. Tuberculosis screening became more challenging due to symptom overlap with COVID19, leading to diagnostic difficulties. Fear of COVID19 exposure also reduced hospital visits, impacting PMTCT services and overall ART adherence. Counseling services, which are essential for psychological support and adherence to ART, were effective before the first total lockdown but became significantly disrupted during the pandemic due to limited interaction with medical personnel. Similarly, TB services did not significantly affect ART uptake before or during the pandemic, though screening challenges arose due to COVID19 symptom similarities. ARV acquisition was initially inconsistent before the lockdown but improved with the introduction of multi-month ART refills to reduce hospital visits. However, accessibility issues such as transport restrictions, financial constraints, and bureaucratic barriers, including the need for travel permits, significantly hindered service uptake.

Recommendations

Implement decentralized ART distribution mechanisms, such as community-based ART groups and home deliveries, to ensure uninterrupted access to medication during emergencies.

Provide the new injectable v for HIV vaccine and medicine or free by the government to prevent frequent visitation of the ART clinic.

Expand multi-month ART refills to stable patients beyond pandemic periods in case of outbreak of any pandemic, to reduce the frequency of hospital visits.

Increase the availability of tele-health counseling services to provide continuous psychological support, especially during emergencies.

Train healthcare workers on remote counseling techniques to improve patient engagement and adherence to ART.

Develop emergency transport policies for ART patients to ensure access to healthcare facilities during public health crises.

Engage local government authorities in providing travel permits for ART patients without compromising their privacy and confidentiality.

Provide financial assistance programs or transportation vouchers to support patients facing economic hardships.

Advocate for income generating initiatives for ART patients to sustain their livelihood, especially in times of crisis.

Improve diagnostic capacity by integrating screening services at ART clinics to ensure timely and accurate diagnosis.

Provide continuous training for healthcare workers on differential diagnosis and co-management of TB and COVID19 cases.

Increase awareness and outreach programs targeting pregnant women to ensure early HIV diagnosis and PMTCT service uptake.

Improve community engagement strategies to encourage male involvement in PMTCT programs, thereby increasing support for HIV-positive pregnant women.

Develop national guidelines to ensure continuity of ART services during public health emergencies.

Enhance collaboration between government agencies, NGOs, and community-based organizations to create resilient healthcare frameworks.

6.3 Determining the proportion of HIV patients who were diagnosed and missed treatment before and during COVID-19 pandemic lockdown at Soroti Regional Referral Hospital.

Conclusion

The study highlights the influence of COVID-19 pandemic, particularly the first total lockdown, on HIV testing and treatment adherence at Soroti Referral Hospital. Before the lockdown, HIV testing rates were high, especially among females, due to unrestricted movement and mandatory testing for expectant mothers attending antenatal services. However, during the lockdown, testing rates significantly declined because of travel restrictions, fear of contracting COVID-19 since the hospital was designation as a COVID-19 treatment center. Age played a significant role in HIV testing, with younger individuals,

particularly those of reproductive age, being more likely to seek testing. This was attributed to their engagement in risky sexual behaviors and the requirement for HIV testing during antenatal visits. The study corroborates findings from previous research indicating that young people account for a substantial proportion of new HIV infections. Adherence to HIV treatment was also affected by the lockdown. Before the lockdown, adherence was high (86.35%) because of ease of access to healthcare facilities, better counseling, and low cost of transportation. However, adherence dropped to 72.02% during the lockdown due to transport challenges, increased costs, and movement restrictions. While females were more likely to get tested, they had a higher rate of missed treatment appointments compared to males, mainly due to transport difficulties and fear of COVID-19 exposure. Older patients were also more likely to miss their treatment appointments than younger ones due to mobility challenges. This may in turn lead to increase in the number of new infections since most people are not being tested or may also result in death of the patients who missed their medications due lockdowns during the pandemic.

Recommendations

Implement mobile HIV testing units and home-based testing programs to ensure accessibility, especially during movement restrictions.

Expanding, encouraging and providing self-testing kits so that people with fear of testing in public places are catered for.

Establish a system for delivering ART medications to patients' homes or through community-based collection points.

Re-introduce distribution of items for example food items like cooking oil posho and beans among others at the facilities to encourage patients to visit.

Introduce flexible appointment scheduling and tele-health consultations to support adherence.

Provide subsidized transport or transport vouchers for patients attending HIV treatment appointments during emergencies.

Collaborate with community leaders to facilitate safe transportation options during public health crises.

Improve on the facilitation (welfare) of health workers who go for community outreaches to avoid reluctance in service delivery.

Design youth-friendly HIV prevention and testing campaigns to encourage early detection and treatment.

Implement support programs for older patients, including community health worker follow-ups, to minimize missed treatment appointments.

Develop strategies to ensure that females who test positive can easily access and adhere to treatment, such as peer support groups and community health outreach.

Encourage male engagement in HIV testing and treatment through targeted outreach programs and awareness campaigns.

Train healthcare workers on alternative service delivery models, including telemedicine and decentralized care.

Conduct information campaigns emphasizing the importance of continued HIV care during pandemics.

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APPENDICES

Date of review: _____/_____/_____

Issue: This section intends to determine the proportion of patients diagnosed with HIV/AIDS at Soroti regional referral hospital three months before and during lockdown.

Period:

_____

Month: _____Year: _____

Review number: _____

Date	Number of patients tested	Number of Males	Number of females	Test results (Positive)		Ages of positive patients		Comments
				Males	Females	Males	Females	

Date of review: _____/_____/_____

Issue: This section in tends to determine the proportion of patients that continued with treatment of HIV/AIDS at Soroti referral hospital.

Period:

_____

Month: _____Year: _____

Review number: _____

DATE	No of patients visiting the clinic	No of Patients attended	No of Patients missed	No of Males missed	No of females missed	comments	Ages of patients who missed	Years On ARVs

I am Eboyu Thomas student of master of public health from Kyambogo University, Department of biological sciences carrying out research on *Covid-19 pandemic on access to health care services among people living with HIV/AIDS at Soroti regional referral hospital in Soroti city*. Please it will be my pleasure if you spare some time on your schedule and answer the following questions.

Section 1:

Social demographic characteristics of people with HIV/AIDS at Soroti referral hospital

1. Gender of the participant

a) Male ☐ b) Female ☐

2. How old are you?

A) 18-23 years ☐ b) 24-29 years ☐

c) 30-35 years ☐ d) 36-41 years ☐

e) 42-47 years ☐ f) 48-53 years ☐

g) 54 years and above ☐

3. What is your marital status?

a) Single ☐ b Married ☐

c) Separated ☐ d Widow/widower. ☐

e) Others, ……

4. Which of these best describes your level of education?

a) Never attended school ☐ b) Pre-primary level ☐

c) Primary level ☐ d) Secondary level ☐

e) Tertiary institution ☐ f) University level ☐

g) Others,……

5. What is your occupation?

a) Public servant ☐ b) Business person ☐

c) Self-employed ☐ d) without a job ☐

e) Peasant ☐

f) Others, (specify) ……

6. Area of residence

a) Urban ☐ b) Rural ☐

7. Size of the family

a) Less than 3 people ☐ b) 4 to 5 people ☐

c) 6 to 8 people ☐ d) Over 9 people ☐

Section 2:

This section seeks to understand patient's views on HIV/AIDS services accessibility, availability, affordability, and acceptability in Soroti regional referral hospital.

1. Availability

1.1 How do you assess the hospital's overall HIV/AIDS services?

1.1.1) On-going HIV/AIDS counselling

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

1.1.2) TB

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

1.1.3) ARV

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

1.1.4) Wards

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

1.1.5) PMCT (prevention of mother to child transmission)

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

1.1.7) Other (Specify).....

2. Accessibility

2.1 How would you rank the appropriateness of this Hospital's physical location and accessibility (ease of access)?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

2.2 How do you rate waiting time at the hospital?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

2.3 How would you evaluate the convenience of this hospital's amenities for persons with chronic illnesses?

Highest ○ higher ○ high ○ Poor ○ n not sure ○

4.4 How accessible do you think any clinician at this institution is (clinical officers, ART experts, etc.)?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.5 What distance do you take to reach the health facility to access your medication?

0-5 km ○ 6-10 km ○ 11-15km ○ 16-20km ○ 21+ km ○

4.6 What is the mode of transportation you take to get to the health institution?

Foot ○ Bicycle ○ Motorcycle ○ Vehicle ○ Other ○

4.7 How many times did you visit the hospital three months before first lockdown (from 29- Dec-2019 to 30- March-2020)?

……

How many times did you visit the hospital three months during first lockdown (from 1-April- 2020 to 4- July- 2020)?

……

3. Affordability

3.1 How would you rank the hospital's total charges and expenditures for ART?

Increased ◯ Satisfactory ◯ Low ◯ given for free, ◯ I don't comprehend ◯

3.2 How would you evaluate the charges and fees for any specialist care you get at the hospital as a consequence of the medication?

3.2.1 Psychiatry is the study of mental illness.

Increased ◯ Satisfactory ◯ Low ◯ given for free, ◯ I don't comprehend ◯

3.2.2 Ophthalmology (diagnosis and treatment of disorders of the eye)

Increased ◯ Satisfactory ◯ Low ◯ given for free, ◯ I don't comprehend ◯

3.2.3 Dental

Increased ◯ Satisfactory ◯ Low ◯ given for free, ◯ I don't ◯ comprehend

3.2.4 Dermatological (specialist in treating the skin, hair and nails)

Increased ◯ Satisfactory ◯ Low ◯ given for free, ◯ I don't comprehend ◯

3.2.5 Other: _____

Increased ◯ Satisfactory ◯ Low ◯ given for free, ◯ I don't ◯ comprehend

3.3 Would you suggest other individuals for ART treatments at this institution, given the rates and costs?

Totally agree ◯ Agree ◯ Disagree ◯ Totally Disagree ◯ Don’t Know ◯

How much do you spend on transport **from your home to this health facility** to access medication

……
……

4. Acceptability

4.1 How would you assess the professional competency of physicians who treat you during hospital visits, in your opinion?

Highest ○ higher ○ high ○ Poor ○ I'm not ○ sure

4.2 How would you assess the doctor's demeanour (pleasant, compassionate, listening, etc.)?

Highest ○ higher ○ high ○ Poor ○ I'm ○ not sure

4.3 How would you rank the doctor's quality of time spent addressing your requirements (explaining about health and treatments, patient, and not in a hurry)?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.4 How would you rank the hospital's privacy and confidentiality during an examination?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.8 How would you rank nurses' behaviour (smiling faces, politeness, caring attitude, supportiveness, time to chat, time to clarify difficulties, etc.)?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.6 How would you rank the nursing care (promptness in answering requirements, inquiries about pain, etc.) in your opinion?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.7 How would you rank this hospital's health education program?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.8 How would you rank the hospital's level of communication and information to you?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.9 How would you rank the overall condition of the hospital's facilities?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.10 How would you rank the hospital's overall cleanliness?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

4.11 What is your opinion of this hospital's record-keeping accuracy?

Highest ○ higher ○ high ○ Poor ○ I'm not sure ○

Section 3:

This section intends to determine the factors that have affected getting and taking drugs (ART) exactly as prescribed (adherence to antiretroviral therapy)

1. What are the factors that affected continuous uptake and getting of ART during lockdown?

……
……
……
……
……
……
……
……
……
……
……
……

Appendix 2: Table 1: showing percentage of gender and Age groups who were tested for HIV/AIDS before and during first total lockdown

Diagnosis acquired							
		Before first total lockdown			During first total lockdown		
Variable		n (%)	X^2	P - value	n (%)	X^2	P - value
Gender	Male	1262 (38.4)	5.089	< 0.01	1233 (41.2)	4.973	< 0.01
	Female	2025 (61.6)			1761 (58.8)		
	Total	3287			2994		
Age	1 - 10	173 (5.3)	312.222	< 0.01	103 (3.4)	317.495	< 0.01
	11 - 20	913 (27.8)			453 (15.1)		
	21 - 30	832 (25.3)			1067 (35.6)		
	31 -40	1121 (34.1)			869 (29.0)		
	41 - 50	171 (5.2)			299 (10.0)		
	> 50	77 (2.3)			203 (6.8)		
	Total	3287			2994		

Appendix 7: Rec clearance letter

CLARKE INTERNATIONAL UNIVERSITY
LEAD · INNOVATE · TRANSFORM
RESEARCH ETHICS COMMITTEE
(+256) 0312 307400
rec@ciu.ac.ug
www.rec.ciu.ac.ug

11/10/2022

To: EBOYU THOMAS

KYAMBOGO UNIVERSITY
0703278056

Type: Initial Review

Re: CLARKE-2022-440: COVID – 19 PANDEMIC ON ACCESS TO HEALTH CARE SERVICES AMONG PEOPLE LIVING WITH HIV/AIDS AT SOROTI REGIONAL REFERRAL HOSPITAL, two, 2022-10-19

I am pleased to inform you that the Clarke International University REC, through expedited review held on **06/10/2022** approved the above referenced study.
Approval of the research is for the period of **11/10/2022** to **11/10/2023.**

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for rereview and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of

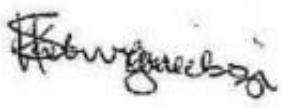
all study records, and consent documentation may be part of such audits.

5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **11/10/2023** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by Clarke International University REC:

No.	Document Title	Language	Version Number	Version Date
1	Protocol	English	two	2022-10-19
2	Data collection tools	ENGLISH	one	2022-09-23
3	Informed Consent forms	ENGLISH	one	2022-09-23
4	RISK MANAGEMENT PLAN FOR COVID-19	ENGLISH	one	2022-09-15
5	Informed Consent forms	local (Ateso)	one	2022-09-15
6	Data collection tools	local (Ateso)	one	2022-09-15

Yours Sincerely



Samuel Kabwigu

For: Clarke International University REC

Appendix 8: UNCST APPROVAL LETTER

Uganda National Council for Science and Technology

(Established by Act of Parliament of the Republic of Uganda)

Our Ref: HS2579ES

19 December 2022

THOMAS EBOYU

KYAMBOGO UNIVERSITY

Kampala

Re: Research Approval: COVID – 19 PANDEMIC ON ACCESS TO HEALTH CARE SERVICES AMONG PEOPLE LIVING WITH HIV/AIDS AT SOROTI REGIONAL REFERRAL HOSPITAL

I am pleased to inform you that on **19/12/2022**, the Uganda National Council for Science and Technology (UNCST) approved the above referenced research project. The Approval of the research project is for the period of **19/12/2022** to **19/12/2023**.

Your research registration number with the UNCST is **HS2579ES**. Please, cite this number in all your future correspondences with UNCST in respect of the above research project. As the Principal Investigator of the research project, you are responsible for fulfilling the following requirements of approval:

1. Keeping all co-investigators informed of the status of the research.

2. Submitting all changes, amendments, and addenda to the research protocol or the consent form (where applicable) to the designated Research Ethics Committee (REC) or Lead Agency for re-review and approval **prior** to the activation of the changes. UNCST must be notified of the approved changes within five working days.

3. For clinical trials, all serious adverse events must be reported promptly to the designated local REC for review with copies to the National Drug Authority and a notification to the UNCST.

4. Unanticipated problems involving risks to research participants or other must be reported promptly to the UNCST. New information that becomes available which could change the risk/benefit ratio must be submitted promptly for UNCST notification after review by the REC.

5. Only approved study procedures are to be implemented. The UNCST may conduct impromptu audits of all study records.

6. An annual progress report and approval letter of continuation from the REC must be submitted electronically to UNCST. Failure to do so may result in termination of the research project

Please note that this approval includes all study related tools submitted as part of the application as shown below:

No.	Document Title	Language	Version Number	Version Date
1	Informed Consent forms	ENGLISH	TWO	19 October 2022
2	Data collection tools	ENGLISH	TWO	19 October 2022
3	Project Proposal	English	ONE	
4	Approval Letter	English		
5	Administrative Clearance	English		
5	Questionnaires	English	1	15 December 2022
6	Translated consent form	ATESO	1	15 December 2022
7	Informed consent form	English	1	15 December 2022
8	COVID-19 RISK MANAGEMENT PLAN	English	1	15 December 2022
9	EBOLA RISK MANAGEMENT PLAN	English	1	15 December 2022

Yours sincerely,

Hellen Opolot

For: Executive Secretary

COUNCIL FOR SCIENCE AND TECHNOLOGY

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