International Journal of Recent Development in Engineering and Technology
Website: www.ijrdet.com (ISSN 2347-6435(Online) Volume 15, Issue 01, January 2026)

Assessment of Prevalence of Hypertension Among Centre of Treatmenta Care Attendees in Zanzibar

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***Abstact*-- This study examined the prevalence of hypertension among adults attending Care and Treatment Clinics (CTC) at Mnazimmoja Referral Hospital in Zanzibar, focusing on the effects of antiretroviral therapy (ART). In a cross-sectional design with 360 participants aged 18 and older who had been on ART for at least three months, the prevalence of hypertension was found to be 38.9%. Most participants were female (78.6%), with 60% aged 18–40, and over 70% earned below 800,000 TZS monthly. Prolonged ART use significantly increased hypertension risk, particularly for those on certain regimens. The study concludes that hypertension is a major public health concern for adults living with HIV in Zanzibar. It recommends integrating hypertension management into HIV care and improving health education on diet and exercise while suggesting further research on ART's long-term cardiovascular impacts.**

***Key Terms*-- Hypertension, Prevalence,Centre of Treatment and Care**

I. INTRODUCTION

Non-communicable diseases (NCDs) are non-contagious conditions, often referred to as chronic diseases. They are termed “chronic” because they typically persist over a long duration and result from a combination of genetic, environmental, and behavioral factors (Abdullahi, Kingsley, Yusuf, Otutu, & Nwose, 2025). Common types of chronic non-communicable diseases include cardiovascular diseases, chronic respiratory diseases, cancers, and diabetes (WHO, 2024).

Globally, approximately 1.28 billion adults aged 30–79 years suffer from hypertension, with a higher burden in low- and middle-income countries (Cherfane & Haddad, 2024). Elevated blood pressure (BP) contributes to approximately 7.6 million deaths annually worldwide, with about 54% of stroke cases and 47% of coronary heart disease cases caused by high BP; over 80% of this burden occurs in low- and middle-income countries (Chen, Mocumbi, Ojji, Waite, Chan, Beilby, & Stewart, 2024).

The development of high blood pressure progresses through several phases: normal, elevated, stage 1, and stage 2 hypertension (Kapur, Kanwar, Sinha, Thayer, Garan, Hernandez-Montfort, & Burkhoff, 2022). The normal phase indicates systolic pressure is less than 120 mmHg and diastolic pressure is below 80 mmHg, while the elevated phase shows systolic pressure ranges from 120 to 129 mmHg with diastolic pressure remaining below 80 mmHg (Wang, Chen, Lin, Su, Dai, Chen, & Ye, 2024). Stage 1 hypertension is characterized by systolic pressure between 130 and 139 mmHg or diastolic pressure between 80 and 89 mmHg (Kumar & Byadgi, 2021). In stage 2 hypertension, systolic blood pressure is 140 mmHg or higher and diastolic blood pressure is 90 mmHg or higher, while blood pressure readings below 90/60 mmHg indicate hypotension, which can cause symptoms like dizziness and fainting. Conversely, blood pressure exceeding 180/120 mmHg is deemed a hypertensive emergency (Bharathvikrem, 2023), potentially resulting in severe complications including chest pain, heart attack, heart failure, and irregular heartbeat. This study aims to implement interventions that enhance awareness, improve treatment, and boost blood pressure control among individuals (Zhou, Perel, Mensah, & Ezzati, 2021). In line with population-based strategies, interventions are designed to reduce high BP across the population, ensuring regular access to healthcare services that promote treatment adherence and minimize therapeutic inertia, both of which correlate with improved control rates. Effective collaboration among partners, healthcare providers, and health systems is crucial for implementing a multilevel approach to hypertension control, thus contributing to a reduction in its overall prevalence (Ordunez, Campbell, DiPrete, Jaffe, Rosende, Martinez, & Brettle, 2024).

Globally, the prevalence of hypertension among people living with HIV/AIDS is estimated at 25.2% (Denu, Revoori, Buadu, Oladele, & Berko, 2024).

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Individuals on long-term antiretroviral therapy (ART) exhibit an even higher prevalence of hypertension at 34.7%, compared to just 12.7% among those not receiving ART (Xu, Chen, & Wang, 2017). In Sub-Saharan Africa (SSA), hypertension affects an estimated 46% of the population, with around 93% at high risk for various complications such as stroke, myocardial infarction, heart failure, kidney disease, and blindness (Olowoyo, Barango, Moran, Williams, Whelton, Owolabi, & Whelton, 2024). This high burden is attributed to unhealthy diets, sedentary lifestyles, harmful alcohol consumption, and smoking, alongside factors such as obesity, physical inactivity, aging, low education levels, income disparities, and psychosocial stressors (Matemane et al., 2024). In Tanzania, approximately 33% of adults aged 30–79 years have been diagnosed with hypertension, with 32% being women and 35% men. The region experiences significant mortality, with around 106 people dying from hypertension-related causes every six months in a single hospital (WHO, 2023).

In Zanzibar, the current prevalence of hypertension is reported to be 33.5% (Jorgensen et al., 2020), but the number of reported hypertensive cases has fluctuated; it declined from 59,656 cases (3.2%) in 2022 to 40,244 cases in 2023. Nonetheless, there is no clear estimate of the prevalence in 2023 itself, and the decrease may be linked to health policy initiatives aimed at reducing the burden of hypertension, such as strengthening healthcare services and regulating food imports (ZSA, 2023). Despite existing strategies, the specific prevalence of hypertension among individuals living with HIV and AIDS in Zanzibar remains unknown due to a lack of published data. Further research is essential to increase awareness of hypertension risk factors within the population. Most studies on hypertension have focused on mainland Tanzania, leaving a gap in knowledge related to Zanzibar. Recent investigations, such as that conducted in 2020, addressed prevalence but do not reflect current trends, thus highlighting the need for continued study in this area to comprehensively understand hypertension's impact in Zanzibar.

Statement Of The Problem

Hypertension is a major public health concern and a leading cause of complications such as kidney disease, vision loss, and mental health issues. It is a significant risk factor for cardiovascular diseases worldwide, particularly prevalent in low- and middle-income countries where access to healthcare is limited and lifestyle factors exacerbate its burden.

Among people living with HIV and AIDS, the prevalence of hypertension is estimated at 25.2% (Denu et al., 2024). Moreover, individuals with low incomes in African countries significantly outnumber those with higher incomes (Park et al., 2023).

Globally, an estimated 1.28 billion adults suffer from hypertension, many of whom remain undiagnosed and untreated (WHO, 2023). In Sub-Saharan Africa, the prevalence is high, contributing to numerous deaths. In Tanzania, it is estimated that 29% of people living with HIV and AIDS are affected by hypertension (Nyangi & Getera, 2020), highlighting a substantial mortality risk in this population.

In Zanzibar, approximately 33.5% of the population is affected by hypertension, influenced by factors such as urbanization, dietary habits, and physical inactivity. Limited awareness, poor lifestyle choices, long-term ART use, and inadequate healthcare services further exacerbate the high burden. Though the region has initiated measures, including a national survey system for non-communicable diseases and free blood pressure screening, many remain unaware of their condition. This study aims to assess hypertension prevalence and associated risk factors among adults at the Care and Treatment Centre (CTC) at Mnazimmoja Referral Hospital, providing crucial insights for targeted healthcare interventions to mitigate the disease's impact in Zanzibar.

Study Objective

1. General Objective

To assess prevalence of hypertension among adult attendees at CTC in Zanzibar.

2. Specific Objectives

i. To determine the prevalence and burden of hypertensionamong adult attendees in Care and Treatment Centres (CTC) in Zanzibar.

II. Literature Review

2.1 The prevalence and burden of hypertension

The prevalence of hypertension is public health issues globally and estimated that the prevalence of hypertension globally is 35% (WHO, 2023) and 75% of all death worldwide is caused by NCDs associated with cardiovascular diseases, cancers (including lung cancers, cervical cancers and breast cancers), diabetes and chronic respiratory diseases (WHO, 2024).

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The previous study revel that, the prevalence of hypertension in urban regions tend to be a higher compared to rural areas, this is caused by factor such as lifestyle physical inactivity, higher stress levels poorer diet quality, higher consumption of processed foods, and limited access to green spaces, which all are risk factors leads to increases blood pressure level.

However, the prevalence of hypertension is 1.33 times greater in man and 1.23 greater in individual receiving ART (Chen, et al, 2024). However, some type of ART particularly nevirapine, zidovudine, and stavudine are common ART that led to elevation of blood pressure when used for long time (Siddiqui, Moore, Long, Burkholder, Willig, Wyatt, Heath, Muntner & Overton, 2022).

In low- and middle-income countries, the prevalence of hypertension is higher where in sub-Saharan Africa, is range between 30 to 43% (WHO, 2023). However, cardiovascular disease is most prevalence in low and middle-income countries. Hypertension is causing a number of deaths globally as well as health complication such as cardiovascular problem. In addition, some study shows that, in both rural and urban living individuals are at risk of developing hypertension due to metabolic and behavioral factors between the individuals.

However, according to global health report on hypertension, theAfrican regions, have higher prevalence of cardiovascular disease which including hypertensionwhich is around 23.6% (WHO**,** 2023). The prevalence of hypertension in Africa varies between country to country and according to global hypertensive report in 2019 from WHO suggest that the African country like Botswana have high prevalence of hypertension (47%) followed by Zimbabwe (46%), Namibia (45%) and south Africa (44%) (WHO, 2023). It is also, in sub-Saharan Africa, hypertension is estimating that there is significant portion of the adult population suffers from hypertension, often exceeding 25% in many countries, with the highest rates seen in Sudan and the lowest in Eritrea (Matemane, et al., 2024).

According to the recent studies the urban area has high prevalence of hypertension (35%) as compare to rural area (19%). The difference in prevalence of hypertension in rural area is due to increasing age, obesity and lack of physical activity, high salt intake in their diet, a sedentary lifestyle, limited access to healthcare, and family history of hypertension (Khamis et al. 2020). In addition, hypertension leading to kidney problems, pulmonary edema and cerebral hemorrhage (Egekeze, et al., 2024).

However, in urban area most of peoples developing hypertension as the result of risk factor such as sedentary lifestyle contributed to physical inactivity, a diet with high salt content and saturated fats consumption, increased stress level due to life difficulties and lack of social support, obesity, and a lack of access to healthy food options (Khamis, et al., 2020).

On basis of gender, the proportion of hypertension between male and female varies. The older female individuals are more likely to develop hypertension than male. However, the number of females attending in treatment care was higher than male in most health treatment care (Mosha, et al., 2017). The resent study reveals that, the proportion of female with hypertension is higher (8.0%) than male (7.7%). The higher prevalence of hypertension in female older is due to combination of factors such as menopause, hormonal changes including pregnancy and use of certain drugs used during birth control (Mosha, et al., 2017). The prevalence of hypertension has slight variation between female with HIV negative and positive, mean that that female with HIV positive is more prevalent to systolic blood pressure (Magodoro, et al., 2022).

In East African countries, the prevalence of hypertension is also higher. For example, the east African country having higher prevalence of hypertension is Ethiopia (40%), followed by Burundi (36%), Kenya (35%), Uganda and Rwanda (WHO, 2023). The prevalence of hypertension in Tanzania is approximated to 35% and most people die with cardiovascular disease caused by hypertension (WHO, 2023). In Tanzania, the burden of cardiovascular disease is also higher, and is mainly caused by people lifestyles changes (Gibore, et al., 2021). The prevalence of hypertension is associated with facto such as knowledge about hypertension history complications and modified life style and limited of treatments. Lack of knowledge about hypertension symptoms and complications leads to low treatment adherence and lifestyle modification, especially in semi-urban and rural settings.

2.2 Research gap

While numerous studies have examined the prevalence of hypertension among the general population in sub-Saharan Africa, there is limited data specifically focusing on people living with HIV (PLHIV) who are on Antiretroviral therapy (ART), particularly in the context of Zanzibar.

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Most existing literature either overlooks the unique metabolic and cardiovascular effects of long-term ART use or fails to consider how local lifestyle and healthcare access factors in Zanzibar contribute to the risk of hypertension in this population. Furthermore, Zanzibar lacks updated and publicly accessible epidemiological data, which limits evidence-based planning for integrated HIV and non-communicable disease (NCD) care.

Therefore, this study seeks to address this gap by assessing the prevalence and risk factors of hypertension specifically among ART users in Zanzibar, providing essential insights for targeted public health interventions.

III. Materials And Methods

This study adopted a quantitative research approach. The quantitative approach was deemed appropriate because it allows for the systematic collection and analysis of numerical data to determine the prevalence of hypertension and its associated risk factors among adult attendees at Care and Treatment Centres (CTC) in Zanzibar.This study employed a descriptive cross-sectional study design. The unit of analysis in this study was the individual adult patient attending a Care and Treatment Clinic (CTC) in Zanzibar. Each participant was an adult aged 18 years or older, currently receiving Antiretroviral Therapy (ART) at the selected CTC. Participants were individually assessed for blood pressure status, as well as associated socio-demographic, clinical, and lifestyle risk factors.This study employed a systematic random sampling technique to select participants from among adult patients attending the Care and Treatment Clinic (CTC) at Mnazimmoja Referral Hospital.The study usedKish and Leslie (1995) to obtain sample sizeof 350 respondents.The study used structured questionnaire to collect data on socio-demographic characteristics such as age, sex, education and income. Behavioral factors such as diet, smoking, alcohol use physical activity and medical history from HIV patients. In additional to that, the study applied Anthropometric measurements that comprise height and weight was measured to calculate Body Mass Index (BMI) of HIV patients. Also, the study conducted blood pressure measurement. Blood pressure was measured using a calibrated digital Sphygmomanometer, following WHO guidelines (two measurements taken five minutes apart, averaged).

The data obtained from the respondents was put into ODK system for design digital questionnaires (with skip logic, validation, etc.), collect data offline using smartphones, uploading data to a server, export data in formats compatible with analysis tools like SPSS, Storage and cleaning the data. The data is then was sent into SPSS for analysis. The software used for data analysis was SPSS software of 26 versions. This is because this it simple to be adopted in our study because is not much complex than other software. The SPSS software contains Descriptive statistics (mean, frequency, and percentages), Cross-tabulations, Chi-square tests (for associations) and Logistic regression which are essential mechanism of data analysis in this study. Demographic data were analyzed through descriptive statistics, while analytical data were examined using bar charts, and regression analysis models. Frequency distribution tables were employed to summarize analytical data, including measures such as the mean, median, and mode. For regression analyses, linear regression was used for numerical data, and logistic regression was applied for categorical data. In addition, p-values were calculated to determine statistical significance. Descriptive statistics were used to identify the prevalence of hypertension among adult attendees in Zanzibar, highlighting proportions based on gender and age.

IV. Study Findings

4.1 Demographic characteristics of CTC participants

This subtitle involved the analysis and interpretations of demographic data of the studying participant in Zanzibar.

4.1.1 For age, gender, residence and Education Level

Figure 2 presents the analysis of the data collected from the field. The results indicate that the majority of participants (60%) were young to middle-aged adults between 18 and 40 years, while 40% were aged 41 years and above. The number of female participants (78.6%) was notably higher than that of males, who accounted for only 21.4% of the total study population(Mosha, et al., 2017). Regarding educational attainment, most participants (64.2%) had low levels of education, whereas 35.8% had attained higher education. Finally, participants were nearly evenly distributed between urban (49.4%) and rural (50.6%) areas ((Sun et al., 2022).

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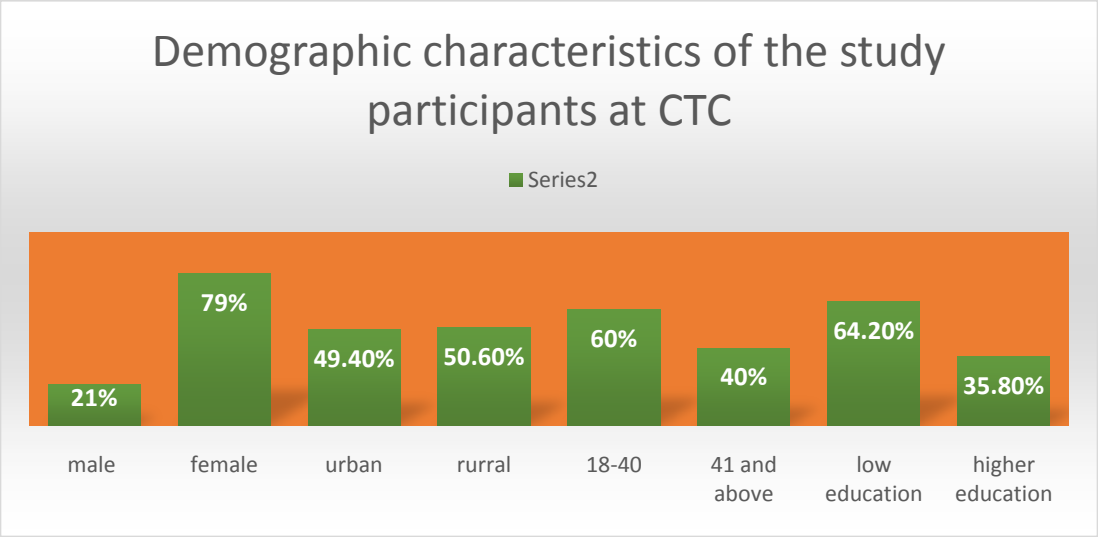

Figure 4.1: Demographic characteristics of the study participants at CTC

Source: Field Data (2025)

Figure 2 presents the demographic characteristics of the study participants. The results show that most individuals attending the CTC were relatively young, consistent with the general HIV-infected population in sub-Saharan Africa, where HIV predominantly affects younger adults. This is same noted by (CDC, 2018). However, the 40% of participants aged 41 years and above represent a substantial group at higher risk of non-communicable diseases such as hypertension(Jorgensen, et al., 2020). This finding aligns with previous studies across the region, which have consistently shown that HIV infection is most prevalent among individuals in their most productive age group, typically between 15 and 49 years (WHO, 2021&TACAIDS, 2022).

Females comprised the majority of participants (78.6%), whereas males accounted for only 21.4%. Higher female attendance and adherence to health services have also been reported by (Amour et al. 2022), suggesting that women are more likely to utilize CTC services and follow-up care than mena pattern commonly observed in HIV programs in East Africa. The predominance of female participants may also influence the overall prevalence of hypertension, as hormonal and lifestyle factors differ by sex (Maman et al., 2012).

4.1.2 In case of income and marital status

Out of 360 participants, over 70% earned less than 800,000 TZS per month, indicating that the majority belonged to the low-income category, while only 6.9% reported a high income exceeding 3,000,000 TZS per month. Regarding marital status, the largest group of participants were divorced (40.3%), followed by married individuals (36.1%), with widowed (13.3%) and single participants (10.3%) representing smaller proportions(Li et al., 2022).

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Table 4.1:
demographic characteristics of study participants, N = 360

Characteristics	Frequency %
Monthly income	
≤ 250,000 – 400,000 TZS	129(35.8%)
400,001-800,000 TZS	130(36.1%)
800,001-3,000,000 TZS	76(21.1%)
> 3,000,000 TZS	25(6.9%)
Marital status	
Married	130 (36.1%)
Divorced	145 (40.3%)
Widow	48 (13.3%)
Single	37 (10.3%)

Source: Field Data (2025)

Out of 360 participants, over 70% earned less than 800,000 TZS per month, indicating that the majority belonged to the low-income category, while only 6.9% reported a high income exceeding 3,000,000 TZS per month. The large number of populations to have low income also noted by NBS. This suggests that economic constraints may influence access to healthcare services, adherence to treatment, and the ability to adopt lifestyle modifications that prevent hypertension(Chireshe, et al., 2024). Regarding marital status, the largest group of participants were divorced (40.3%), followed by married individuals (36.1%), with widowed (13.3%) and single participants (10.3%) representing smaller proportions. This is also is same noted by Tanzania census (Census, 2022) that show that the number of married are higher than divorced. The variation on number of individuals with low, moderate and higher income was also suggested by (Park, et al. 2023). Therefore, the low income of individual may limit access to healthy foods, regular medical check-ups, and physical activity options, which can contribute to hypertension. The high proportion of divorced and married individuals may reflect social and economic pressures that could contribute to stress-related risk factors for hypertension among the study population.This difference also was stated by (Brown, Lin, Hammersmith & Wright, 2018).

The high percentage of divorced and widowed participants may reflect the social and emotional challenges linked to HIV, including partner separation or loss, which can also contribute to psychological stress as a factor associated with hypertension(Li et al., 2022). Lastly, the participants were almost evenly distributed between urban (49.4%) and rural (50.6%) areas. This balance suggests that the study captured a representative mix of both urban and rural CTC attendees(Khamis et al. 2020). However, urban residents may face higher risks of hypertension due to sedentary lifestyles and dietary factors, whereas rural residents may have lower risks but reduced healthcare access(Ranzani et al., 2022).

4.2 Prevalence of hypertension in Zanzibar

This subtitle represents the result after analysis of demographic, behavioral and clinical characteristics of studying participant using descriptive statistics in SPSS. This interpretation summarized in the table 4.2 below.

4.2.1 The prevalence of hypertension in Zanzibar based on demographic characteristics of studying participants

Among hypertensive participants, 74.3% were aged 41 years and above, while only 25.7% were aged 18–40. Conversely, 81.8% of the non-hypertensive group were younger (18–40 years).

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Hypertension was significantly more common among older adults (≥41 years) (p<0.001). This finding aligns with global and regional evidence that age is one of the strongest predictors of hypertension, as vascular elasticity declines with age(Khamis et al. 2020). For the gender difference, 90.0% of hypertensive participants were female, compared to 10.0% male.

Females showed a significantly higher prevalence of hypertension (p<0.001) and possible explanations include hormonal changes, higher obesity rates, and lifestyle differences, especially among postmenopausal women and long-term ART users(Siddiqui, et al., 2022). In case of income level,49.3% of hypertensive participants earned between ≤250,000–400,000 TZS, while only 7.9% earned above 3,000,000 TZS. Therefore,hypertension was significant more prevalent among low-income groups (p<0.001). But the lower income may contribute to poor diet quality, stress, and limited access to healthcare, increasing NCDS risk (Lamloum, Fassio, Osetinsky and Tediosi, 2023). Moreover, 75.7% of hypertensive individuals had low education, compared to 24.3% with highereducation. Since, low education was strongly associated with hypertension(p<0.001).

This may relate to limited health awareness, poor diet control, and lack of regular medical screening among less educated individuals. In addition, the highest proportion of hypertensive were married (50%), followed by divorced (18.6%). It means being married was significantly associated with hypertension (p<0.001). The married individual being more hypertensive may be reflected by age distribution, as married individuals are typically older. Stress and lifestyle factors could also play a role(WHO, 2023). 43.6% of hypertensive participants resided in urban areas, compared to 56.4% in rural areas.Although, the difference was not statistically significant (p = 0.075), hypertension appeared slightly higher in urban dwellers, consistent with urbanization, sedentary lifestyle, and dietary salt/fat consumption trends(Khamis et al. 2020).

4.2.2 The prevalence of hypertension among adult attendees at CTC in Zanzibar by behavioral characteristics of studying participants

On bases on dietary habits, 38.6% of hypertensive participants reported using one or more tablespoons of salt daily, compared to 28.6% among non-hypertensive(Tesfaye et al., 2021).High salt intake was significantly associated with hypertension (<0.001), which consistent with WHO evidence that excessive sodium consumption raises blood pressure risk. While there was no significant association was found between fat intake and hypertension (p = 0.731).

Although some participants reported high fat consumption, this factor was not independently significant in hypertension prevalence, possibly due to self-report bias or variations in diet type(Tesfaye et al., 2021).

Out to 140 participants observed in the study to have hypertension, 45% of hypertensive participants reported substance use, compared to 10.5% among non-hypertensive. The substance uses such alcohol, tobacco, or smoking was significantly linked to hypertension (Jorgensen, et al., 2020). These substances elevate blood pressure through vascular constriction and oxidative stress (<0.001). However, there is no single type (alcohol, tobacco, or smoking) showed a significant individual difference (p = 0.541).But in general substance use increased hypertension risk, specific substance types were not statistically distinctpossibly due to small subgroup sizes.

Out of 140 participants assigned in the study having hypertension, 31.4% of hypertensive individuals they do physically activities compared to 54.1% among non-hypertensive.Physical inactivity was strongly associated with hypertension (p<0.001). Regular individual physical activities help to helps regulate blood pressure, and inactivity among PLHIV increases cardiovascular risk(Esmailiyan et al., 2023). Among those individuals engaged on physical actives, Participants who exercised less than 150 minutes/week such as running or sports were more likely hypertensive. Therefore, short exercise duration (<150 minutes) is insufficient to achieve cardiovascular benefits(Matemane et al., 2020). Longer activity duration (≥300 minutes) was protective against hypertension. The physical activities are strong associated with hypertensive status (p<0.001). In case of medical checkup,there was no significant difference in hypertension prevalence (p=0.656). This as stated by (Esmailiyan et al., 2023), that it reduces the risk of health problem like hypertension.

4.2.3 Prevalence of hypertension based on clinical factor of studying participants at CTC in Zanzibar

On 140 participants observed to have hypertension, 88.6% of hypertensive individuals had been observed on ART for greater than 5 years duration on ART (p < 0.001). Hence, the longer ART duration was significantly associated with hypertension. This was also stated by(Peck et al., 2014) that a long duaration of ART leading to hypertension. The chronic ART exposure contributes to metabolic changes, insulin resistance, and lipid abnormalities, all predisposing to hypertension.

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Furthermore, hypertension was most common among those on TDF + 3TC + DTG (40.7%) and TDF + FTC + LPV (32.1%). It means different ART regimens influence hypertension risk, especially protease inhibitor-based regimens (like LPV), which are known to increase cardiovascular risk(Matemane et al., 2020). The type of ART regimens had strong association risk with hypertension ($p<0.001$). Obesity, is one of the factors leading to higher prevalence of hypertension ($p<0.001$). Out of 140 participants with hypertension,20.7% of hypertensive were obese compared to 9.5% non-hypertensive.

The excess weight increases cardiac workload and vascular resistance, contributing directly to elevated blood pressure. Moreover, out of 140 participants having hypertension.Participants with low CD4 (<350 cells/mm³) had low hypertension prevalence (25%). 70% of hypertensive participants had two or more comorbidities, compared to 30% of non-hypertensive out of the total participants having hypertension. The individual having multiple Comorbidities increases the risk of hypertension significantly ($p<0.001$).

The prevalence of hypertension was higher in individual having diabetes 17.9%), heart problems (9.3%) and kidney disease (10.7%) were all significantly associated with hypertension ($p<0.001$).

Hypertension was more frequent in Stage I (35.7%) and Stage II (61.4%) than in advanced stage. The finding was also conducted in Cameron stating the hypertension prevalence is associated with HIV stage (Kouanfack et al., 2024). Where 89.3% of hypertensive participants reported had family history of hypertension. This was due to strong genetic predisposition, making family history one of the most significant predictors of hypertension among CTC attendees ($p<0.01$). However, in HIV stage, hypertension was associated with clinically stable HIV stages, likely due to improved survival and long-term ART exposure, not disease progression itself ($p<0.001$). same as stated by (Kouanfack et al., 2024). lastly, out of 140 participants having hypertension, 54.3% of hypertensive participants had BMI > 25 kg/m², compared to 17.3% of non-hypertensive. Therefore, overweight and obesity were strongly linked to hypertension ($p<0.001$) and this confirms that body weight management is essential in reducing hypertension among ART clients.

Table 4.2
the prevalence of hypertension by demographic behavioral and clinical characteristics of studying participants.

Characteristics	Total (N=360)	Hypertensive(N=140)	Not hypertensive (N=220)	p-value
Age (year)				**<0.001**
18-40	216(60.0%)	36(25.7%)	180(81.8%)	
41 and above	144 (40.0%)	104(74.3%)	40(18.2%)	
Gender/sex				**< 0.001**
Male	77 (21.4%)	14 (10.0%)	63 (28.6%)	
Female	283 (78.6%)	126 (90.0%)	157 (71.4%)	
Monthly income				**< 0.001**
≤ 250,000 – 400,000 TZS	129 (35.8%)	69 (49.3%)	60 (27.3%)	
400,001-800,000 TZS	130 (36.1%)	39 (27.9%)	91 (41.3%)	
800,001-3,000,000 TZS	76 (21.1%)	21(15.0%)	55 (25.0%)	
> 3,000,000 TZS	25 (6.9%)	11 (7.9%)	14 (6.4%)	
Education level				**< 0.001**
Low education	231(64.2%)	106(75.7%)	125(56.8%)	
Higher education	129(35.8%)	34(24.3%)	95(43.2%)	
Marital status				**< 0.001**
Married	130 (36.1%)	37 (26.4%)	93(42.3%)	
Divorced	145 (40.3%)	70 (50.0%)	75 (34.1%)	
Widow	48 (13.3%)	26 (18.6%)	22 (10.0%)	
Single	37 (10.3%)	7 (5.0%)	30 (13.6%)	
Residence				**0.075**
Urban	178 (49.4%)	61 (43.6%)	117 (53.2%)	
Rural	182 (50.6%)	79 (56.4%)	103 (46.8%)	
BEHAVIORAL FACTOR	**Total (N=360)**	**Hypertensive** (N=140)	Not hypertensive (N=220)	**p-value**

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How many tablespoons of salt use in your diet a day?				**< 0.001**
One or more tablespoon of salt	170(47.2%)	85(60.7%)	85(38.6%)	
Less than one tablespoon of salt	190(52.8%)	55(39.3%)	135(61.4%)	
How many tablespoons of salt use in your diet a day?				**0.731**
6.5 or more tablespoon of fats or oil	184 (51.1%)	70 (50.0%)	114 (51.8%)	
Less than 6.5 tablespoon of fat or oil	176 (48.9%)	70 (50.0%)	106 (48.2%)	
Substance use				**< 0.001**
Yes	86 (23.9%)	63 (45.0%)	23(10.5%)	
No	274 (76.1%)	77 (55.0%)	197 (89.5%)	
Type of substance use				**0.541**
Cigarette smoke	46 (12.8%)	22 (15.7%)	24 (10.9%)	
Alcohol drink	33 (9.2%)	14 (10.0%)	19 (8.6%)	
Tobacco use	5 (1.4%)	2 (1.4%)	3 (1.4%)	
Other	276 (76.7%)	102 (72.9%)	174 (79.1%)	
Physical activity				**< 0.001**
Yes	163 (45.3%)	44(31.4%)	119(54.1%)	
No	197 (54.7%)	96 (68.6%)	101 (45.9%)	
Duration on physical activities				**< 0.001**
<150 minutes per week-low activities	53 (14.7%)	30 (21.4%)	23 (10.5%)	
150–300 minutes per week-moderate	65 (18.1%)	26 (18.6%)	40 (18.2%)	
>300 minutes per week-higher	45 (12.5%)	6 (4.3%)	39 (17.7%)	
Medical check up				**0.656**
Yes	239 (66.4%)	92(65.7%)	147 (66.8%)	
No	121 (33.6%)	48(34.3%)	73 (33.2%)	
Clinical factor	Total (N=360)	H.T (N=140)	No, H.T(N=220)	P-value
Duration on ART				**< 0.001**
3 months to 1 year	41 (11.3%)	2 (1.4%)	39 (17.7%)	
2-4 years	58 (16.1%)	14 (10.0%)	44 (20.0%)	
More than 5 years	261 (72.5%)	124 (88.6%)	137 (62.3%)	
Type of ART				**< 0.001**
TDF+3FC+DTG	184(51.1%)	57(40.7%)	127(57.7%)	
ABC+3TC+ATV	32(8.9%)	31(22.1%)	1(0.5%)	
TDF+FTC+LPV	47(13.1%)	45(32.1%)	2(0.9%)	
Others	97(26.9%)	7(5.0%)	90(40.9%)	
Obesity				**< 0.001**
Yes	38 (10.6%)	29 (20.7%)	9 (4.1%)	
No	322 (89.4%)	111 (79.3%)	211 (95.9%)	
CD4 count				**< 0.001**
< 200 cells/mm^3	56 (15.6%)	35 (25.0%)	21 (9.5%)	
> 200 cells/mm^3	142 (39.4%)	50 (35.7%)	92 (41.8%)	
One or more comorbidity				**< 0.001**
Yes	127(35.3%)	109 (77.9%)	18 (8.2%)	
No	200 (55.6%)	18 (12.9%)	182 (82.7%)	
Not know	33 (9.2%)	13 (9.2%)	20 (9.1%)	
Type of comorbidity				**0.032**
Diabetes	38 (10.6%)	25 (17.9%)	13 (5,9%)	
Heart problem	35 (9.7%)	13 (9.3%)	22 (10.0%)	
Kidney problem	32 (8.9%)	15 (10.7%)	17 (7.7%)	
TB	22 (6.1%)	7 (5.0%)	15 (6.8%)	
Individual history of BP				**< 0.001**
Yes	118 (32.8%)	98 (70.0%)	20 (0.91%)	
No	242 (67.2%)	42 (30.0%)	200 (90.9%)	

International Journal of Recent Development in Engineering and Technology
Website: www.ijrdet.com (ISSN 2347-6435(Online) Volume 15, Issue 01, January 2026)

HIV stage				**< 0.001**
Stage I	195 (54.7%)	50 (35.7%)	145 (65.9%)	
Stage II	148 (41.1%)	86 (61.4%)	62 (28.2%)	
Stage III	12 (3.3%)	3 (2.1%)	9 (4.1%)	
Stage IV	5 (1.4%)	1 (0.7%)	4 (1.8%)	
Family history on hypertension				**< 0.001**
Yes	184 (51.1%)	125 (89.3%)	59 (26.1%)	
No	176 (48.9%)	15 (10.7%)	161 (73.1%)	
BMI range				**< 0.001**
> 25 kg/m^2	114 (31.7%)	76 (54.3%)	38 (17.3%)	
< 25kg/m^2	246 (68.3%)	64 (45.7%)	182 (82.7%)	

Source: Field Data (2025)

V. Conclusion

The study concluded thatthe prevalence of hypertension was found to be 38.9%. Most participants were female (78.6%), with 60% aged 18–40, and over 70% earned below 800,000 TZS monthly. Prolonged ART use significantly increased hypertension risk, particularly for those on certain regimens.

VI. Recommendations

The study recommended that Government of Zanzibar, through the Ministry of Health and Zanzibar AIDS Control Programme (ZACP), should integrate hypertension management into HIV care guidelines and ensure every Care and Treatment Clinic (CTC) routinely screens all ART clients for blood pressure, weight, and body mass index.

The society and local communities should promote supportive environments for healthy living, such as community sports, walkathons, and low-cost fitness programs in both urban and rural area of Zanzibar. The society and local communities should encourage family participation in hypertension and HIV education to enhance awareness and early detection of the problem early when happen in the community or society.

Acknowledgements

First and foremost, my acknowledgement goes to the Almighty God for his protection and wisdom. It is through good health and favor provided by Him that has kept me in healthy and alive to achieve my dream.

I would like to express my deepest gratitude to my first supervisor, Prof; Sayoki G. Mfinanga for his positive critiques, encouragement and support that has enable me to complete this academic work. My second thanks if to my second supervisor, Dr. Layoni Mwanyika who gave me a guidance on preparation and motivation on this work to be more perfect for academic document.

The special thanks goe to Director of Post graduate Studies and Research, Dr. Mary Mosha for her positive critique and continuous support.

I extend my special appreciation to my mother and my father who has always been there for me.

To my lovely lectures Prof. Ngadaya & Dr. Janneth thank you so much for your academic and moral support and God bless you.

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