

**KAM COLLEGE OF HEALTH AND ALLIED SCIENCES.**



**TITLE: DETEMINING PREVALENCE OF ANAEMIA AMONG HUMAN IMMUNODEFICIENCY HIV INFECTED PEOPLE IN TANZANIA**.

**A CASE STUDY AT MNAZI MMOJA HOSPITAL**

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**RESEACHER REPORT FOR PARTIAL FULFILLMENT OF ORDINARY DIPLOMA.**

**JULY 2020**

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**ABREVIATIONS**

ART: Antiretroviral treatment

AOR: Adjusted Odds Ratio

CI: Confidence interval

COR: Crude Odds Ratio

MDG: Millennium development goal

OPD: Outpatient department

WHO; World health organization

OPD; Out patient department

IPD; In patient department

CTC- Care and Treatment Clinic

.KCOHAS-Kibaha College of health and allied science

.HMIS- Health Management Information Systems

HIV- Human Immunodeficiency Virus

PLWHIV: People Living with Human Immunodeficiency Virus.

AZT.Zidovudine

HAAT.Highly Active Antiretroviral Therapy

**ABSTRACT**

There is paucity of data describing the risk factors for anaemia among HIV in Tanzania. This cross sectional study was carried out to determine the contributing factors for anaemia among HIV-infected people attending Mnazi Mmoja Hospital in Dar es Salaam. Both univariate and multivariate logistic regression analyses were performed to identify possible factors associated with anaemia in HIV-infected people A total of patients among 759 recruited HIV-infected people awere found to be anaemic (Hg<11g/dl). Multivariate logistic regression demonstrated that not being on HAART (OR 3.40, 95%CI (1.20-9.60), having CD4% <25% (OR 2.30, 95%CI (1.20-34.60), having a history of tuberculosis (TB) (OR 3.23, 95%CI (1.10-9.70) and were independent risk factors for anaemia among HIV infected people. The analyses also showed that being HIV positive for male low risk of severe anaemia compared to being HIV positive for female. Taking multivitamins (OR 0.07, 95%, CI (0.020-0.30) and antihelminthics (OR 0.27, 95%CI (0.10-0.74) were also protective against anaemia. Similar factors (with exception of using antihelmintics) were associated with severe anaemia. In conclusion the factors associated with anaemia in HIV infected people were multifactorial in nature. Efforts to correct anaemia in HIV infected people should include use of HAART and treatment of infections such as TB.

**CHAPTER ONE**

**INTRODUCTION AND BACKGROUND INFORMATION TO THE PROBLEM**

1.1 Introduction

The acquired immunodeficiency syndrome (AIDS) is a systemic viral disease caused by human immunodeficiency virus (HIV) with a asymptomatic period which ranges from a few months to as many as 17 years. It is a serious health problem throughout the world in general and in developing countries in particular. It has continued to spread steadily in the general population and it is commonest in the sexually active group of which is also the most economically group of adults.

1.2. Background Information

HIV/AIDS was firstly recognized in the United States of America in 1981,

In Tanzania this disease was firstly reported at 1983, in Kagera region (UNAIDS 2001). World Health Organization WHO estimates that 8-10 million people were infected with the HIV virus in 1992, by the year 2000 an estimates of more than 60 million people were living with HIV/AIDS world wide, (DT Barton and Wolf stout, 1998).

Currently there is no cure or vaccine for HIV/AIDS; however the provision of ant retro viral drugs and positive prevention strategies.

Care and treatment clinic (CTC is a corner stone for successful implementation of care and support services among HIV positive individuals. CTC is also perceived to be an effective clinic in risk reduction of HIV transmission through health education that enhances behavior change.

Care and Treatment Clinic serves to provide prophylactic treatment of HIV, post exposure prophylactic treatment for HIV to eligible people, perform WHO clinical staging to HIV and AIDS patients, initiate ART to patients who are eligible, manage opportunistic infections.

Dar es salaam region is one of the regions of Tanzania, due to population density, their people are forced to move to different parts of the country aimed to overcome their economic constraints. The movement believed to enhance extra marital sexual activities and so by doing hence the HIV/AIDS 8 transmission,

HIV/AIDS virus once they come back to their partners they seed the us resulting to high prevalence of HIV/AIDS infection in the region

Most of the people are involve in agriculture activities and business while Poverty is major problem facing the people living in Dar es salaam especially in interior area which make to dormant without participate in any activities. All of these seems to fueling spread of HIV/AIDS infection among the Dar es salaam residents in particular economical potential young aged group and adults. This is due to the frequently contact, intercultural interactions and the exchange of different social interest.

Tanzania is one of the most seriously HIV affected countries in East Africa. Anemia is a known predictor of disease progression and death among HIV infected patients. In this study, I am going to investigate the prevelance of anemia among HIV infected patients receiving HAART at Temeke referral hospital in Tanzania.

Complications of human immunodeficiency virus (HIV) infection include hematological abnormalities manifested by pancytopenia, anemia being the leading abnormality. Several factors including stage of HIV, age and sex are said to account for the variations in HIV prevalence. The causes of anemia have been reported to be multifactorial. Direct effects of HIV and its viral proteins as well as immune dysregulations during HIV infection were found to be responsible for bone marrow suppression. Moreover, opportunistic infections of the bone marrow with pathogens such as *Mycobacterium avium complex*, *Parvovirus B-19*, Cytomegaloviruses, *Cryptococcus neoformans* and *Histoplasma capsulatum* were reported to cause abnormalities in blood cell counts Drugs used to treat HIV infection and its complications are also known to cause bone marrow suppression. It is widely known that AZT alone and AZT based highly active antiretroviral treatment (HAART) regimen is associated with significant reduction of hemoglobin (Hb) level

Anemia is associated with impaired physical functioning, psychological distress and poor quality of life. Besides, independent of CD4 and viral load counts, anemia has been reported to predict HIV progression to acquired immune deficiency syndrome (AIDS) with poor survival; on the other hand, treatment of anemia was observed to be associated with reversal of increased risk of death. In addition, anemia was reported to be strongly and consistently associated with HIV disease progression and death despite HAART suggesting the need for routine screening and treatment of anemia in HIV patients on HAART. Besides, AZT-based HAART is one of the first line regimens recommended for treating HIV infected adults. This study will investigate the prevalence of anemia and among HIV infected patients at Temeke Refferal Hospital.

**1.2. Problem of statement**

Anemia in HIV has often been associated with morbidity and deaths that occur despite several measures being undertaken especially in CTC clinics this might be due to inadequate information on Anemia in HIV in terms of causes, sources, prevelance, drug sensitivity and immune response. HIV patients are at a high risk of developing anemia due to drugs used to treat HIV infection and its complications are also known to cause bone marrow suppression. It is widely known that AZT alone and AZT based highly active antiretroviral treatment (HAART) regimen is associated with significant reduction of hemoglobin (Hgb) level.

The prevalence of anemia was significantly higher among HIV positive woman (56.5%, N=1153); OR 1.49(95% CI; 1.09-2.010). The HIV positive women also had significantly higher prevelance of both moderate and severe anemia. In multivaretanalysisi anemia was independently associated with malaria (P < 0.005) HIV (P=0.008), clinic of enrollment (P<0.001) a makers of low social – economic status. Delivery information was available for 85 %( 2256) of the 2654 enrolled women 86%(1080)for anemic women and 84%(11760for non anemic women.

**1.4 Significance of the study**

The reason this study was to uncover the prevelance of anemia in HIV patients, I Wanted to highlight and evaluate this in my setting here at Mnazi Mmoja designated regional referral hospital in order to see which age group and sex were more affected as HIV lowers immunity. In addition this study had showen other medical conditions associated with anemia in HIV infected individuals. Also this study is part of my clinical officer.

**1.5 Objectives of the study.**

**1.5.1 Broad objective;**

To determine the prevelance of anemia in HIV patients attending Mnazi Mmoja Hospital

**1.5.2 Specific objectives;**

To identify the risk factors of anemia in HIV adult patients at t Mnazi Mmoja hopistal Tanzania

To determine the rate of female and male patients with HIV and anemia at Mnazi Mmoja hopspital Tanzania

**1.6 Research questions**

What is the prevalency of anaemia among the HIV attending in Mnazi Mmoja Hospital?

What are the factors associated with anaemia with HIV to the Patient attending in Mnazi Mmoja

To rule out the risks of ART in patients with HIV.

**1.7Research variables.**

Dependant variable is HIV

Independent variable is anemia.

**1.8 Hypothesis formulation**

Alternative hypothesis;

People with HIV have high chance of getting anemia.

Null hypothesis;

People with HIV have less chance of get anemia.

**CHAPTER TWO**

**LITERATURE REVIEW**

**1.1.Introduction**

Guidiline to a particular topic to support for a new insight that contribute

A literature review provides helpful guidelines to a particular topic, it can be used as

a foundation and as a support for a new insight that contribute.

IN Zimbabwe prevalence of anemia before and after ART initiation was 41.9 and 11.4 respectively. There are significance differences in CD4 +T cell count , RBC count, haemoglobin values and RBC indices in HIV patients before and after ART initiation (p-value<0.05). WHO clinical stagntes and CD4+T cell counts were found to be associated with the prevelance of anemia before ART initiation. Among the total number of anemic cases normocytic normochromic anemia was present in 71%of the cases before ART and 58.6% of the cases after ART (Belperio etal (2004)

Prevelance of anemia among HIV patients considerably depends on several factors, including the stage of HIV disease, sex, age, pregnancy status, and injection used. In general, as HIV disease progresses, the prevelance and severity of anemia increase. Anemia is also more prevalent in HIV –positive women, children, and injection- drug users. (WHO 2001)

In china among the 1948 patients, 75.8% were male. Median age was 40 years (range; 18-80 years). The overall prevalence of anemia among HIV infected patients was 51.9% (51.5% among men, 53.2 among women). The prevalences of mild, moderate and severe anemia were 32.4%, 187.0% and 2.5%, respectively.

The prevalence of anemia was higher among ethnic minority patients than among the Han patients (70.9% versus 45.9%) (De Benoist (1993)

The prevalence of anemia increased with increasing age (49.6%, 53.5% and 60.1% among patientswho were 18-39, 40-59, and >60% years of age respectively) and with decreasing CD4 count (14.05, 22.4%, 50.75 and 74.6 among patients with CD4 count of>350, 200-349,50-199,and 50 cells/mm^respective.)

Our observations show that around 86% of HIV-positive patients are anemic in North India and the degree of the severity of anemia has a statistically significant positive correlation with CD4 cell counts. Nomocytic normochromic anemia is the most common morphological type of anemia found in these patients while microcytic and macrolytic anemias are less frequent Iron , vitaminB12, and folate deficiencies play a significant role in causing anemia in at least one third of the patients.(WHO 2001)

In Tanzania the findings related that 57% of the under five children are anemic in Tanzania at the time of study, under five children in Zanzibar are at higher risk compared to those in Mainland (unadjusted OR 1.857). At 95% CI female are less likely to be anemic compared to male children.(UNICEF United Republic of Tanzania statistics,2010.2012)

Also the risk of anemia reduces as Childs age increases at 95% both in bivariate and multivariate analysis. Age of mother is significantly associated with anemia among under five children in bivirate analysis; as the age of mother increases, the likelihood of anemia among under five children decreases (OR 0.981) but it is insignificant in multivariate analysis. Consequently, the risk of anemia is higher among children whose mothers are not married compared to those whose mothers are unmarried.(Ferede G eta 2013)

In Tanzania, total of 250 women (200 HIV positive women and 50 Negative) were included in the study. The anthropometric and biological characteristics of HIV positive and HIV negative women at enrolment. All women were greater than 18 years of age and age did not differ significantly lower among HIV positive than among HIV negative women. Fifety (25%) HIV positive women were receiving HAART. The mean haemoglobin concentration was significantly lower HIV positive women than in HIV negative women (12.5+\_2.9g/dl, respectively; P<0.001), and the prevalence of anemia among HIV positive than among HIV positive than among HIV negative men. (UNICEF United Republic of Tanzania statistics,2010.2012)

**CHAPTER THREE**

**RESEARCH METHODOLOGY**

**3.0 Introduction**

This chapter describes how the study will be done and the way the research findings will be presented. It explains about, study area, study type/design, study population, sampling techniques, sample size, data collection technique and tools, data processing and analysis and ethical consideration.

**3.1Study type/design**

The design was cohort study whereby it is the class of research methods which was involves collection of data from Health Management Information System (HMIS) at a specified time period.

**3.2 Study Area**

The study was conducted in Internal Medicine Department and CTC clinic at Mnazi Mmoja Hospital in Tanzania.

**3.3 Study Population**

The study sample was conducted in population of all patients diagnosed with HIV infection attending CTC at Mnazi Mmoja Hospital from March 2018 to July 2019.

**3.4 Study unit** All patients who were diagnosed with HIV infection attending CTC at Mnazi Mmoja Hospital.

**3.5Sampling procedure**

Random sampling was used to obtain the sample size for the study as it shows in the formula below

3.6 Sample size

This was calculated from the formulae N=ZP {1-P}/e

Where; N= Sample size

Z=Standard normal deviation

P=Proportion of patient

E=Maximum error =10%

P=Prevalence

N=4×43(100-43) =98.04 98people.

102

So the number of sample size was 98 people who were selected.

**3.7Data collection techniques and tools**

The data was collected , The study employed the use of the following techniques, particularly interview, observation, questionnaire and documentation. The interviewees were guided by the already prepared questionnaires designed for different types of respondents. Other data collection tools are pens, pencils, ruler and note book.

**3.7Data processing and analysis**

Data were collected and analyzed manually by using paper sheet, notebook aided with calculator, coded and entered into the computer by using Microsoft word office and Microsoft office excel spreadsheets.

**3.8 Ethical consideration**

All information obtained was confidential. Patients’ names was not used; just the codes were been required. After compilation, the proposal was submitted to the principal of Kam college staffs and also at Mnazi Mmoja Hospital ethical committee for approval to conduct the research.

**3.9Utilization and dissemination of result**

The research was presented to the supervisors, research teach, staff members and student my college school. Also a copy of the complete research report was made available to the supervisors and other copies were submitted to the library studies.

**3.9.1Study limitation**

Difficult to collect data collection procedure,the register books were filled by resercher through observation

**CHAPTER FOUR**

**RESEARCH FINDINGS**

Table 1.Distribution table shows the risk factors of anemia in HIV patients from June 2020 to august 2020.

|  |  |
| --- | --- |
| MONTHS | NUMBER OF HIV PATIENTS WITH ANAEMIA. |
| June | 228 |
| July | 374 |
| August | 1O5 |

Objective 1 To identify risk factor of anaemia in HIV adults patients from June to July

GRRAPH TO SHOW RISK FACTOR OF ANEMIA IN HIV ADULT PATIENTS HIV ADULT PATIENTS FROM MARCH TO JULY 2020

In these findings its shows that a lot of patients in month of March did not know the course of anemia in HIV but still the next month also patient were ignorant on anemia in HIV. In June all patients with anemia due to HIV infections or HAAT naives were given education on using of zidovudine which is the main course of anemia and change to other medication. As its shows in July the number has decreased and less people were affected.

Objective 2 To determine the rate of male and female patients with HIV and Anemia from June to August

Table 2.The table to show the rate of Male and Female patient with HIV and Anemia from March 2020 to July 2020

|  |  |  |  |
| --- | --- | --- | --- |
| MONTHS | MALE | FEMALE | TOTAL |
| June | 125 | 103 | 228 |
| July | 152 | 222 | 374 |
| August | 45 | 60 | 1O5 |

In the findings shows more rate of female patients of HIV patient with anemia than Male patient

**5.1.DISCUSSION**

The study aimed to provide baseline data on the current status of risk factors for anaemia in HIV infected people at a national and referral hospital. To our knowledge, this is the first hospital based study undertaken on risk factors for anaemi in people infected with HIV in Tanzania.The study subjects were adult. This created a homogenous study population in which there were no marked differences in age structure to influence the interpretation of the haematological findings related to physiological variation with age on blood cell counts and red blood cell indices, these haematological parameters tend to remain constant (Lewiset al.,2001). In this study despite the fact that about two thirds of the study population were already on highly active antiretroviral therapy, the majority of them were in WHO clinical stage 3 and 4 and had a CD4% level of < 25% at the time of this study. This meant that most of the patients were in intermediate to advanced stages of immunosuppression despite being on ARV which could be expected to boost the immunity and the clinical stage. The majority of the study subjects looked clinically better than their CD4 % level would indicate. This discrepancy might be partly explained by a possible short duration of HAART for many of the study subjects to allow significant increment in clinical status and CD4 level at the time of this study. The other possible explanation for this lack of correlation between proportion of patients who were on HAART and their clinical stage and immunity status might be a delay to seek or access HIV service thus presenting at the hospital with severe immunosuppression which could take longer time of improvement by HAART. This study found that having a history of tuberculosis in the past four months at the time of the study was a strong independent risk factor for both mild and severe anaemia in HIV infected people. Strong association of tuberculosis and anaemia was also reported by Subbaraman (2007) when studying anaemia in HIV infected persons in Southern India. This finding is also consistent with results of another study done in the northern part of Tanzania where anaemia was found to be common among HIV-TB co-infected persons (Ngowi et al., 2008). The aetiology of anaemia in TB is likely to be multifactorial, deriving partially from anaemia of chronic disease (associated with increased IL-6) and partly from deficiencies of nutrients such as iron, vitamin A, and selenium (Villamor et al., 2008). A recent study in Malawi has also shown that occult mycobacterium disease was highly associated with anaemiain HIV infected children(Caliset al.,2008). The role of HAART in anaemia associated with HIV infection was shown in this study. It was demonstrated that not being on HAART was an independent risk factor for anaemia. A similar finding was reported by Feyler et al. (2002) in which the use of HAART led to the reduction in the prevalence of anaemia from 13% in 1995 to 4% in 1999. They pointed out that the improvement of immunological and clinical status associated with the increasing efficacy of antiretroviral therapy possibly explained a large part of the reduction of the risk ofanaemia. Low CD4 counts (< 25%) and high HIV-1 RNA levels in plasma have been associated independently with increased risk of anaemia (Volberding et al., 2004). This finding is

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consistent with the results from this study in which subjects who had CD4 levels of < 25% had a higher risk of developing severe anaemia than those with CD4 levels of > 25%. However, this did not correlate with advanced WHO clinical stage whose association was not statistically significant in multivariate analysis. This may be due to the finding that though most of the patients had CD4 levels of < 25%, the majority were in WHO clinical stage 3 and not stage 4 which normally correspond with CD4 levels of < 25%. It was interesting to find that children who had long duration of HIV positivity were less likely to be anaemic, both in univariate and multivariate analysis. The finding is different from a number of studies which have demonstrated strong association between anaemia and long duration of HIV (Belperio et al., 2004; Calis et al., 2008). In this study the explanation for this unexpected finding could be the possibility that most of people with a long duration of HIV, have been on HAART for a long duration which could partly protect them from anaemia and opportunistic infections. It could be also due to longer regular check on their anaemia status at the clinics allowing immediate correction compared to those people who were diagnosed HIV positive for a short duration. Micronutrient supplements have been reported to delay HIV disease progression and reduce mortality in HIV-positive persons not receiving highly active antiretroviraltherapy(Drainet al.,2007). It has been suggested that treatment for helminthes infestation may decreasethe rate of viral replicationin those infected with HIV (Stephensonetal.,2001). In this study malnutrition was associated with anaemia only on multivariate analysis. However, malnutrition contributes significantly to anaemiadue to the deficiency of iron, folate and B12 as well as increased infections. In one study it was shown that nutrient supplement can correct anaemia, though this is faster in HIV-negative undernourished children than those who are HIV positive(Simporeet al., 2005). There was lack of statistical association between chronic fever, recurrent malaria, chronic diarrhoea and WHO clinical stage 3, 4 in multivariate analysis though in univariate analysis they were all associated withanaemia. The findings of this study were limited by other factors. The lack of association in multivariate analysis of anaemia with factors such as WHO clinical stage and malaria may be attributed by the small sample size in this study. Therefore, the absence of the statistical significance in some of the associations has to be taken cautiously. Studies on serum iron, ferritin, and total iron binding capacity, folate, cobalamin level and bone marrow could give more information on the aetiology of anaemia in HIV infected children. Even with these limitations in mind, the observed findings may still be a good reflection of a true situation and this study serves as a reference for further recommendations to improve care of HIV infected peolpe and a step for further studies on the pathophysiology of HIV related anaemiain African people. In conclusion tuberculosis, hookworm infestation and not being on HAART andCD4 <25% were potential risk factors for both mild and severe anaemia. Multivitamin supplementation and use of antihelmintics appeared protective against anaemia in HIV

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infected people. We recommend that all HIV positive people should be regularly screened for anaemia and continue encouraging them to use of multivitamins. The three monthly antihelmintics should be given to all HIV infected people. HAART should be made available to all eligible HIV infected people. Efforts to correct anaemia in HIV infected people should include treatment of infections such as TB

**CHAPTER FIVE**

**5.2.CONCLUSION**

There was a remarkable reduction in the prevalence of anemia after ART initiation.WHO clinical stages and CD4 + T cell counts were associated with the prevalence of anemia before ART initiation.Normocytic normochromic anemia was the commonest type of anemia before ART initiation.Based on the present finding, a significant proportion of HIV patients remained anemic after 6 months of ART initiation suggesting the need for routine screening and proper treatment of anemia to mitigate its adverse effects.

**5.3.RECOMMENDATIONS**

Anemia continue to be a major co-morbidity among adult HIV patient in Tanzania, We recommend further longitudinal studies to determine predictors of anemia in the setting and intervention program to change the

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**QUESTIONAIRES ( ENG)**

**1 PATIENT INFORMATION**

Questionaires number………………………………………

Village name…………………

District name...................................

Region name.....................................

2 what are the causes of anaemia difinciecy

a)destruction of red blood cell

b)low diet

c) Inadequate diet ( )

d) calorie intake

**3 PRESPATING FACTOR**

a)lack of enough food rich in iron

b)Duration of ant retro viral taken ( )

c)Ant partum haemorrhage

d)Martial status

e)Monthly income

f)Education level

**4 HOSPITAL MANAGEMENT OF THE DISEASEa)**

Folic acid

b)No managementc)Counselling on good nutrition ( )

**5CLINICAL PRESENTATRION**

a)Dizzinessb)Shortness of breathc)Headache

6 SEVERITY OF ANAEMIA a)Hb level 10-10.9 g/dl)Hb level 7-9.9 g/dl ( )

c)Hb level <7 g/dlKEY:

A-14-24 years \*--10-10.9g/dl (mild anemia)

B-25-35 years \*\*--7-9.9g/dl (moderate anemia)C->35 years \*\*\*--<7g/dl (severe anemia)

7what do understand about HIV .........................................

b) risk factor of HIV infection?...........................................

c)ways of HIV transmission ?.............................................

d)do you know HIV contribute anemia ...............................

e) mention drug that causes anaemia....................................

**MASWALI (SWAHIL)**

1 USHAURI WA MTOTO

Nambari ya maswali ………………………………………

Jina la kijiji …………………

Jina la wilaya .........

Jina la mkoa ……………………………

2 ni nini sababu za anemia difinciecy

a) uharibifu wa seli nyekundu ya damu

b) lishe ya chini

c) Lishe isiyofaa ()

d) ulaji wa kalori

3 DALILI YA KUFANYA

a) ukosefu wa chakula cha kutosha chenye madini

b) Muda wa virusi vya ant retro kuchukuliwa ()

c) Kutokwa na damu kwa sehemu

d) Hali ya kijeshi

e) Mapato ya kila mwezi

f) Kiwango cha elimu

4 Usimamizi wa HOSPITAL WA DESIA)

Asidi ya Folic

b) Hakuna usimamizic) Ushauri juu ya lishe bora ()

PRESENTATRION 5CLINICAL

a) kizunguzungu) Upungufu wa pumzi) Kuumwa na kichwa

6 SEHEMU YA ANEMIA a) Kiwango cha Hb 10-10.9 g / dl) Hb kiwango cha 7.7.9 g / dl ()

c) Kiwango cha Hb <7 g / dlKEY:

Miaka A-14-24 \* - 10-10.9g / dl (anemia kali)

Miaka ya B-25-35 \*\* - 7-9.9g / dl (anemia wastani) C-> miaka 35 \*\*\* - <7g / dl (anemia kali)

7ni unaelewa nini juu ya VVU ………………………………………

b) sababu ya hatari ya kuambukizwa VVU? ………………………………………. .

c) njia za maambukizi ya VVU? ..

d) unajua VVU vinachangia anemia ………………………

e) taja dawa inayosababisha upungufu wa damu .........