

# Assessing Suicidal Ideation and Attempts among HIV Patients: A Study at Omdurman National Voluntary Counseling and Testing Center, Sudan, Khartoum State (2021 - 2022)

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**Abstract:** Background: Suicidal ideation and attempt are more frequent in HIV patients than general population. Objective: The aim of this study was to assess the suicidal ideation and attempt among HIV patients in Omdurman National Voluntary Counseling and Testing Center, Khartoum state, Sudan. Methods: Descriptive cross - sectional institutional based study was conducted among HIV patients attending Omdurman national voluntary counseling and testing Center. Systematic random sampling technique was used to select 235 participants from March to May 2021, data was collected by using a questionnaire consisted of sociodemographic and clinical characteristics and validated tool (Mini international neuropsychiatric interview for suicidality - the Arabic version), data was analyzed using SPSS 26 edition and Chi square test, the t test and Multivariate test were used for the associations between variables. Results: Suicidal ideation in the last month was (14.5%), suicidal attempt in the last month was (0.4%) and lifetime suicidal attempt was (4.3%). Suicide risk were high in (2.5%), moderate in (10.6%) and low in (12.7%). Marital status, occupation, duration of diagnosis, WHO stages and opportunistic infections were significantly associated with suicidal ideation, whereas opportunistic infections and marital status were significantly associated with suicidal attempt. Conclusion: The suicidal ideation and attempt in the HIV patients in the last month were 14.5% and 0.4% respectively, and the lifetime suicidal attempt was 4.3%. There is significant association between suicidal ideation and attempt and some sociodemographic and clinical characteristics of the patients.

**Keywords:** Suicidal ideation, Suicidal attempt, HIV, Khartoum state, Sudan

## 1. Introduction

Suicidal ideation is the thought about killing oneself, and suicidal attempt is an intentional but unsuccessful act of killing oneself, various terms used to describe suicidal behaviors like suicidality which is a continuum that ranges from suicidal ideation, suicide plans and suicidal attempts to complete suicide. [1]

Worldwide every year more than 800 000 people die by suicide one person every 40 seconds. It is a public health issue that affects communities, provinces and entire countries. [2]

Suicide rates are high among patients infected with Human Immunodeficiency Virus (HIV), with a prevalence 26% of patients reporting a history of lifetime suicidal ideation and 13% of suicidal attempt. [3]

HIV is an infection that attacks the body's immune system, specifically the white blood cells called CD4 cells, HIV destroys these CD4 cells and weakening a person's immunity against infections, When CD4 count below 200 is described as having acquired immunodeficiency syndrome (AIDS). [4]

World health organization (WHO) classify HIV into four stages:

Stage I: HIV disease is asymptomatic and not categorized as AIDS.

Stage II: include recurrent upper respiratory tract infections and minor mucocutaneous manifestations.

Stage III: includes chronic unexplained diarrhea for more than a month, pulmonary tuberculosis and severe bacterial infections.

Stage IV: includes toxoplasmosis of the brain, candidiasis of the esophagus, trachea or lungs and Kaposi's sarcoma; these diseases are used as indicators of AIDS. [5, 6]

Treatment of HIV include the Antiretroviral therapy (ART) like Nucleoside reverse transcriptase inhibitors, Protease inhibitors, Integrase strand transfer inhibitors and Non - nucleoside reverse transcriptase inhibitors. [7]

HIV patients given Co - trimoxazole (Septrin) for primary prophylaxis from the Pneumocystis Jiroveci Pneumonia. [8]

According to United Nations Program on HIV and AIDS (UNAIDS 2020), Sudan had an HIV prevalence rate of 0.2% among persons aged 15 to 46 years. [9]

Sudan is a country located in north of Africa and its capital city is Khartoum, Total population 41.2 Million, Adults people living with HIV in Sudan are about 42000 in the last year. [10, 11]

In Sudan there are about 48 Voluntary Counseling and Testing (VCT) Centers in Khartoum and 20 in other states and all these Centers under the Sudan National AIDS

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Program. Omdurman national VCT Center One of the main centers in the country. [12, 13]

The aim of the study is to explore the suicidal ideation and attempt in HIV patients in Omdurman national VCT Center and data from the study can help for appropriate interventions for suicide prevention. [14, 15]

### 1.2 Problem statement

Suicidal ideation, attempts, and completions are common among people living with HIV/AIDS, and the rate of suicide completion among HIV patients is three times that of general population according to Cohort study in Switzerland. [16]

In the USA, one in five HIV positive patients report having had suicidal ideation in the previous week. [17]

Identifying high - risk individuals for suicide and providing them with follow - up care and support by mental health professionals should be a key component of all comprehensive suicide prevention strategies. [2]

Therefore, it is important to study the frequency of suicidal ideation and attempt in HIV patients.

### 1.3 Justification:

There is high rates of lifetime suicidal ideation and attempt in patients with HIV/AIDS. [18]

No similar study was done in Sudan, therefore this research is so important to be done.

## 2. Material and Methods

**Study design:** Descriptive cross sectional Institutional based study

**Study duration:** From March to May 2021

**Study area:** Omdurman National Voluntary Counseling and Testing (VCT) Centre, In Omdurman, Khartoum state\_ Sudan.

The center is considered as one of the best region's international centers according to the WHO (2005). It received about 6000 patients per year come from different states of Sudan, the center started in May 2004 as VCT center and in 2005 it received the antiretroviral therapy (ART), it was in Omdurman teaching hospital known as Omdurman management and Counseling Center Unit (OMACU) then in 2018 the center transferred to separate building near tropical disease hospital, in addition to (ART) the center provide Counselling and psychological support for the HIV patients. [12, 13]

### Study population:

Sudanese adult HIV positive patients attending the (VCT) center

**Including criteria:** Eighteen years and above aged HIV - positive patients registered in the center during the study period.

**Excluding criteria:** Patients severely ill, Patients with cognitive impairment and patients known with mental illness prior to diagnosis with HIV

### Sampling:

The sample size was calculated using the formula

$$N = z^2 \cdot (1 - p) / d^2$$

Where N is minimum sample size and Z from Z table for two - tailed study is 1.96

P is Average estimated prevalence of suicidality among HIV - positive patients from previous studies was 18.8%. [41, 42] d is 0.05 that is degree of accuracy desired). Using the above formula, the minimum sample size is: 235. By using Systematic random techniques, the systematic interval will be.

### Study Variables:

**Dependent variables:** The domain of suicidal ideation and attempt

**Independent variables:** Sociodemographic variables including (age, sex, marital status, religion, residence, occupation and education level).

Clinical variables (duration of the illness, WHO clinical staging of HIV, uses of antiretroviral and Septrin drugs and history of opportunistic infections).

## 3. Data Collection Methods and Tools

**Methods:** Data were collected by interview with the patients in private room and under protective measure from COVID 19 (wearing mask, social distance and using hand sanitizer).

### Tools:

- 1) **Questionnaires:** Sociodemographic variables
- 2) Clinical variables including duration of the diagnosis, using of antiretroviral therapy and Septrin treatment, the opportunistic infections and the WHO clinical stages.
- 3) **The MINI (Mini international neuropsychiatric interview for suicidality - the Arabic version)** this instrument designed as a brief structured interview for the major axis 1 psychiatric disorder in DSM - IV and the international classification of diseases, 10<sup>th</sup> edition, which is valid and reliable. [43] The MINI Suicidal Scale consists of six items that are scored. [44]

**Data analysis:** The Statistical Package for Social Science (SPSS), 26th edition was used for analysis. Descriptive statistics were used to show socio - demographic and clinical characteristics of the participants. Chi square test, the t test and Multivariate test were used for the associations between variables and P - value < 0.05 was considered as statistically significant.

### Ethical Consideration:

The study conducted after the approval from the ethical committee in the research unit of the educational developmental center (EDC) in Sudan Medical specialization board (SMSB).

#### 4. Literature Review

HIV is common health problem globally it affects 37 million about two third of them live in African countries. [9]

Mental illness is most encountered in HIV patients, the possible causes is the associated stigma, the difficult course of illness, the direct effect of HIV on brain which can lead to neurocognitive disturbance, systemic opportunistic infections with their neuropsychiatric manifestations, Intravenous (IV) abusers linked to HIV patients as a comorbidity and the side effects of the (ART). [19, 20]

Mental health problems that associated with HIV include depression, mood disorders and suicidal ideation and attempt. [21]

Suicidal ideation is any active thoughts about killing oneself or passive thought about wanting to be dead while suicidal attempt is an intentional act with the non - fatal outcome that is deliberately initiated and performed by the individual. [22, 23]

HIV continues to be Un recognized risk for the suicidal ideation and attempt and they were considered as one of the major health problems worldwide. [24, 25]

After the introduction of Antiretroviral therapy the prevalence of suicidal ideation and attempt in HIV patients decreased but still higher than general populations and populations with other chronic medical illnesses. [26, 27]

##### Previous studies

In Ethiopia (2020) Mogesie Necho et al. conducted a systemic review and meta - analysis in the prevalence of suicidal ideation and attempt in HIV patients in Africa, they reported that the prevalence of suicidal ideation in Ethiopia, Nigeria and Uganda was 22.7%, 25.3%, 9.8% respectively, whereas the prevalence of suicidal attempt in Ethiopia, Nigeria and Uganda was 16.9%, 16.2% and 3.5% respectively. The pooled prevalence of suicidal ideation was larger (27.7%) in studies that used Composite International Diagnostic Interview (CIDI) than (16.9%) in studies that used Mini - international Neuropsychiatric Interview (MINI) and the pooled prevalence of suicidal attempt was 3.75%, and 16.97% in studies that used (MINI) and (CIDI) respectively. They found significant association of the suicidal ideation and attempt with advanced WHO clinical stages of HIV, comorbid depression, poor social support and perceived stigma. [28]

Bitew et al. found in their cross - sectional study in Ethiopia (2016) that suicidal ideation and attempt among people living with HIV/AIDS was 33.6% and 20.1% respectively, suicidal ideation and attempt were significantly associated with being female, single, having CD4 level less than 500, perceived stigma, depression and poor social support. [29]

Hailu Gebremariam et al. carried out their study in HIV positive patients attending to HIV care in Zewditu Memorial Hospital in Ethiopia (2017), the Composite International Diagnostic Interview (CIDI) was used to collect data, Suicidal ideation and attempt was 22.5% and 13.9%

respectively, the researchers found that being female, perceived stigma and depression were associated with suicidal ideation and attempt. [30]

Kefyalew Gizachew et al. conducted a cross - sectional study in suicidal ideation and attempt in 326 of HIV patients in four public hospitals in North Shewa in Ethiopia (2017), they also used (CIDI) for suicidal behavior assessment, they reported suicidal ideation (16%) and suicidal attempt (7.1%), they found significant association with low monthly income, living alone and family history of suicide. [31]

In Nigeria Bolakale carried out a cross sectional study about Suicidality among HIV patients in treatment center in Kaduna Metropolis (2016), He used the suicidality module of the MINI International Neuropsychiatric Interview, the prevalence of suicidality among patients was 16%. Low risk of suicidality was found among 26 (65%) of the forty patients who had suicidality. Moderate risk was found in 5 (12.5%) while 9 (22.5%) patients had high risk of suicidality, thirty - five (14%) had suicidal ideation, 3 (1.2%) had suicide plans while 12 (4.8%) had attempted suicide during their illness. [32]

Catherine et al. investigated 1187 participants in three HIV centers in Nigeria (2017), they used (CIDI) in their study, their results was differ from Bolakale they found suicidal ideation (2.9%) and suicidal attempts (2.3%). [33]

Bibilola et al. carried out a study about suicidal behavior and association in 828 HIV patients in Nigeria (2017) they used (CIDI) tool, the prevalence of suicidal ideation and attempt were 15.1% and 3.9% respectively and they found significant association with lower quality of life and presence of mental disorders. [34]

Rukundo et al. carried out a study in suicidal ideation and attempt in HIV - positive patients attending two HIV specialized clinics in Mbarara In Uganda (2016) they found that suicidal ideation and attempt was 8.8% and 3.1% respectively, they found significant association with depression (P Value 0.001) and anxiety (P Value 0.001) and stigma (P Value 0.027). [35]

Mwenya et al. found that prevalence of suicidal ideation in HIV patients in the ART Clinic Centre in Zambia (2018) was 31%, they used suicidal risk screening scale (SRSS) for data collection. [36]

Schlebusch et al. carried out a study in 190 adult patients in VCT Centre in South Africa (2018), in the 83.1% of the patients who tested HIV - positive the risk of suicidal ideation was 20.5% at 72 hours, while 6 weeks thereafter the risk had increased to 28.8%. They found significant association between suicidal ideation and sero positive HIV status ( $p$  Value = 0.013). They reported that majority of patients with suicidal ideation were males in the younger age group < 30 years. [37]

Nooski Zari and Hassan Joulei conducted a cross - sectional study among 351 HIV patients in (VCT) center in Southwest Iran (2015), they reported that suicidal ideation was found in (15.4%) of the participants, they advocate Schlebusch et al.

study when they found significant association with male gender (P Value 0.007) and they found also Significant association with single Marital status (P Value 0.005). [38]

Youdiil Ophinniet al. examined the suicidal ideation, psychopathology and associated factors among HIV - infected adults in Indonesia (2017), they reported suicidal ideation in (23.3%) of HIV patients, Suicidal ideation was significantly associated with depressive symptoms (P Value 0.000), anxiety symptoms (P Value 0.001), Efavirenz (ART) used (P Value 0.031), CD4 count <500 cells/µl (0.031), and single marital status (0.009). [39]

Mandell et al. investigated adult patients that re - engaging in HIV care in Argentine (2019) they found that 21% of participants had suicidal ideation in the past week, their study revealed that young age, depression and drug abused were associated factors for suicidal ideation. [40]

**5. Results**

**Sociodemographic characteristics**

A total of 235 participants were involved in the study, (35.3%) of the participants in the age group from 29\_39 years and (28.1%) of them in the age group from 40\_50 years. The majority of participants (62.1%) were males. Regarding marital status (53.6%) of the participants were married. The vast majority of participants (92.8%) were Muslims. Regarding educational level (45.1%) of the participants were studied University and post university education. More than half of the participants (51.5%) work in free jobs. The majority of Participants (78.7%) describe their income as insufficient. Most of the participants (75.7%) live in Khartoum state.

**Clinical characteristics:**

The majority of participants (68.5%) their duration diagnosis is more than One year. Regarding the WHO clinical stages of HIV (39.1%) of the participants in the stage 3. The vast majority of patients (97.4%) started using ART and (94.9%) started using Septrin.

Regarding Opportunistic infections (24.3%) of the participants had a Fungal infection, (14.5%) of them had a TB, (13.2%) had a Respiratory infection and (10.2%) had a Herpes Zoster infection.

**Suicidal Ideations and attempts:**

The frequency of suicidal ideations in the last month were (14.5%) of the participants. The frequency of Suicidal attempts in the last month were (0.4%).

The frequency of lifetime suicidal attempts were (4.3%) of the participants.

Regarding Suicidal risk of the participants (2.5%) had a sever suicidal risk, (10.6%) had a moderate risk and (12.7%) had a low suicidal risk (Table 1).

**The associations of Suicidal Ideations:**

There was significant association between marital status and suicidal ideations (P value 0.00) (Table 2), and The Divorced patients had the highest Percent in association (52.9%) then widowed (14.3%).

Also, there was significant associations between suicidal ideations and Occupation (P value 0.003) and the un employed patients had the highest percent in the association (29.3%) (Table 2). There was significant association between suicidal ideation and the duration of the diagnosis (P value 0.029) (Figure 4) and most duration associated with suicidal ideation was from 1\_5 months of duration (27.3%) then from 6 months to 1 year (23.8%).

There was also significant association between suicidal ideation and WHO clinical stage (P value 0.000) and most stage that associated with suicidal ideation was stage 4 (45.5%) then stage 3 (21.7%) (Figure 5). There was significant association between suicidal ideation and opportunistic infections TB, Fungal infection and Herpes zoster the P value was 0.007, 0.000 and 0.000 respectively, suicidal ideations associated with (54.2%) of herpes zoster infections, (38.6%) of Fungal infections and (29.4%) of those developed TB.

**The associations of suicidal attempts:**

There was no significant association between suicidal attempts in the last month and the sociodemographic variables (Table 3), but there was significant association between suicidal attempts in the last month and opportunistic infections TB and respiratory infections and the P value was 0.015 and 0.010 respectively. Suicidal attempts were associated with 3.2% of respiratory infections and with 2.9% of TB.

There was significant association between lifetime suicidal attempts and marital status (P value 0.010), lifetime suicidal attempts were associated with (28.6%) Of Widowed, (5.9%) of Divorced, (4.7%) of single and (2.4%) of married (Table 4).

**Table 1:** The Distribution of HIV patients according to their suicidal risk (N 235)

	Frequency	Percent %
Severe risk	6	2.5
Moderate risk	25	10.6
low risk	30	12.7
Normal	174	74.2
<b>Total</b>	<b>235</b>	<b>100</b>

**Table 2:** The frequency of suicidal ideations in the last month among different sociodemographic variables (N235)

Variables	Category	Frequency	Suicidal ideation		P value
			Yes n (%)	No n (%)	
Age groups	18_28 years	59	13 (22.1%)	46 (77.9%)	0.240
	29_39 years	83	11 (13.3%)	72 (86.7%)	
	40_50 years	66	8 (12.2%)	58 (87.8)	
	>51 years	27	2 (7.5%)	25 (92.5%)	
	Total	235	34	201	

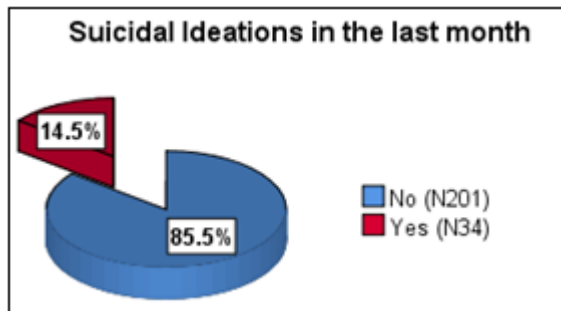
<b>Gender</b>	Male	146	18 (12.4%)	128 (87.6%)	0.232	
	Female	89	16 (17.9%)	73 (82.1%)		
	Total	235	34	201		
<b>Marital status</b>	Single	85	11 (12.9%)	74 (87.1%)	<b>0.000</b>	<b>Significant</b>
	Married	126	13 (10.4%)	113 (89.6%)		
	Divorced	17	9 (52.9%)	8 (47.1%)		
	Widowed	7	1 (14.3%)	6 (85.7%)		
	Total	235	34	201		
<b>Religion</b>	Muslim	218	31 (14.3%)	187 (85.7%)	0.699	
	Christian	17	3 (17.6%)	14 (82.4%)		
	Total	235	34	201		
<b>Educational level</b>	University and post university	106	21 (19.8%)	85 (80.2%)	0.184	
	Secondary	71	9 (12.6%)	62 (87.4%)		
	Primary	37	3 (8.2%)	34 (91.8%)		
	Traditional (Khalwa)	7	1 (14.2%)	6 (85.7%)		
	un - educated	14	0 (0.0%)	14 (100%)		
	Total	235	34	210		
	Outside Khartoum state	57	7 (12.3%)	50 (87.7%)		
<b>Occupation</b>	Employed	35	3 (8.5%)	32 (91.6%)	<b>0.003</b>	<b>Significant</b>
	Freelancer	121	13 (10.7%)	108 (89.3%)		
	Student	21	1 (4.7%)	20 (95.3%)		
	Un employed	58	17 (29.4%)	41 (70.6%)		
	Total	235	34	201		
<b>Income sufficiency</b>	Sufficient	50	6 (12%)	44 (88%)	0.576	
	In sufficient	185	28 (15.2%)	157 (84.8%)		
	Total	235	34	201		

**Table 3:** The frequency of suicidal attempts in the last month among different sociodemographic variables (N235)

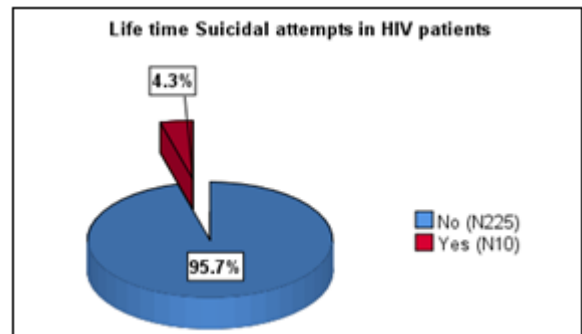
Variables	Category	Frequency	Suicidal ideation		P value
			Yes n (%)	No n (%)	
<b>Age groups</b>	18_28 years	59	1 (1.6%)	58 (98.4%)	0.392
	29_39 years	83	0	83	
	40_50 years	66	0	66	
	>51 years	27	0	27	
	Total	235	1	234	
<b>Gender</b>	Male	146	0	146	0.199
	Female	89	1 (1.2%)	88 (98.8%)	
	Total	235	1	234	
<b>Marital status</b>	Single	85	0	85	0.833
	Married	126	1 (0.8%)	125 (99.2%)	
	Divorced	17	0	17	
	Widowed	7	0	7	
	Total	235	1	234	
<b>Religion</b>	Muslim	218	1 (0.5%)	217 (95.5%)	0.788
	Christian	17	0	16	
	Total	235	1	234	
<b>Educational level</b>	University and post university	106	0	106	0.251
	Secondary	71	0	71	
	Primary	37	1 (2.7%)	36 (97.3%)	
	Traditional (Khalwa)	7	0	7	
	un - educated	14	0	14	
<b>Residence</b>	Khartoum state	178	1 (0.6%)	177 (99.4%)	0.571
	Outside Khartoum state	57	0	57	
	Total	235	1	234	
<b>Occupation</b>	Employed	35	0	35	0.814
	Freelancer	121	1	120	
	Student	21	0	21	
	Un employed	58	0	58	
	Total	235	1	234	
<b>Income sufficiency</b>	Sufficient	50	0	50	0.602
	In sufficient	185	1	184	
	Total	235	1	234	

**Table 4:** The frequency of lifetime suicidal attempts among different sociodemographic variables (N235)

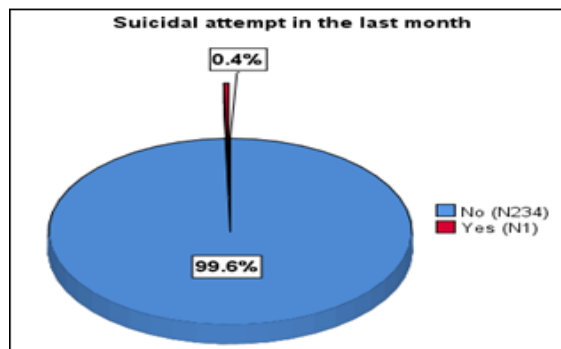
Variables	Category	Frequency	Suicidal ideation		P value	
			Yes n (%)	No n (%)		
Age groups	18_28 years	59	1 (1.6%)	58 (98.4%)	0.265	
	29_39 years	83	6 (7.3%)	77 (92.7%)		
	40_50 years	66	3 (4.5%)	63 (95.5%)		
	>51 years	27	0 (0.0%)	27 (100%)		
	Total	235	10	225		
Gender	Male	146	6 (4.2%)	140 (95.8%)	0.020	Significant
	Female	89	4 (4.5%)	85 (95.5%)		
	Total	235	10	225		
Marital status	Single	85	4 (4.7%)	81 (95.3%)	0.010	Significant
	Married	126	3 (18.7%)	123 (97.6%)		
	Divorced	17	1 (5.8%)	16 (94.2%)		
	Widowed	7	2 (28.5%)	5 (71.5%)		
	Total	235	10	225		
Religion	Muslim	218	9 (4.2%)	209 (95.8%)	0.730	
	Christian	17	1 (5.8%)	16 (94.2%)		
	Total	235	10	225		
Educational level	University and post university	106	6 (5.6%)	100 (94.4%)	0.797	
	Secondary	71	3 (4.3%)	68 (95.7%)		
	Primary	37	1 (2.7%)	36 (97.3%)		
	Traditional (Khalwa)	7	0 (0.0%)	7 (100%)		
	un - educated	14	0 (0.0%)	14 (100%)		
	Total	235	10	225		
Residence	Khartoum state	178	9 (5.1%)	169 (94.9%)	0.282	
	Outside Khartoum state	57	1 (1.7%)	56 (98.2%)		
	Total	235	10	225		
Occupation	Employed	35	0 (0.0%)	35 (100%)	0.208	
	Freelancer	121	4 (3.4%)	117 (96.6%)		
	Student	21	1 (4.7%)	20 (95.3%)		
	Un employed	58	5 (8.6%)	53 (91.4%)		
	Total	235	10	225		
Income sufficiency	Sufficient	50	3 (6%)	47 (94%)	0.576	
	In sufficient	185	7 (3.7%)	178 (96.2%)		
	Total	235	10	225		



**Figure 1:** The frequency of Suicidal ideations in HIV patients in the last month (N235)



**Figure 3:** The frequency of lifetime Suicidal attempts in HIV patients in the last month (N235)



**Figure 2:** The frequency of Suicidal attempts in HIV patients in the last month (N 235)

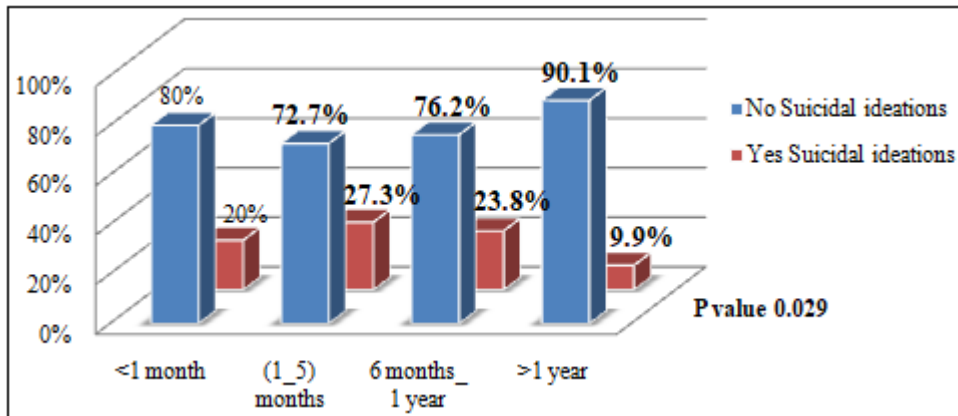


Figure 4: The association between the suicidal ideations in the last month and the duration of the diagnosis of the HIV patients (N235)

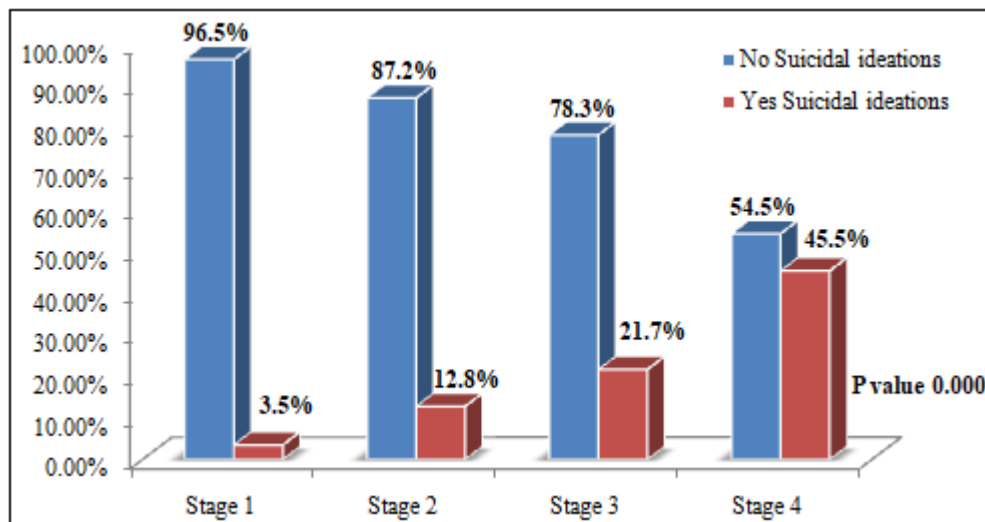


Figure 5: The association between suicidal ideation in the last month and WHO clinical stages of HIV patients (N235)

## 6. Discussion

This study determined the frequency of suicidal ideation and attempts in HIV patients in Omdurman National (VCT) center and the associations with sociodemographic and clinical variables and the severity of suicidal risk, this study considered as first up to date study performed in Sudan about this topic.

The suicidal risk was severe in 2.5% and moderate in 10.6% of the participants this is lower than a study done by Aremu Bolakale et al. in Nigeria he found sever suicidal risk in 12.5% and moderate suicidal risk in 22.5% [32], this may be because of different sample size.

The frequency of suicidal ideation was 14.5% this in line with study done by Bibilola Oladeji et al. in Nigeria they found it 15.1% [34] and Kefyalew Gizachew found in his study in Ethiopia suicidal ideation 16% [31], However suicidal ideation in HIV patients was lower than a study done by Monica M Mwenya in Zambia she found it 33%, the differences can be explained by their using of different instruments. [45]

Suicidal attempt in the last month was 0.4% and lifetime suicidal attempts was 4.3% this is lower than a study done in Ethiopia by Bitew et al. they found Suicidal attempt in the

last month 1.8% and lifetime suicidal attempt 18.8% these differences may be because of using different tool and different sample size. [29]

In this study marital status was significantly associated Suicidal ideation (P value 0.00), divorced and widowed were highly associated with suicidal ideation this supported by Bitew et al. study [29] and by Nooshin Zarei study in Iran (2018) [38], this because marriage seems to be one of the protective factors from suicidal ideation. [37]

There was no significant association between gender and suicidal ideation in this study in contrast to study done by Bibilola Oladeji et al. [34] and Wonde M. et al. [47], they found suicidal ideations associated with female gender while Nooshin Zarie [38] found it associated with male gender these differences may because female gender in this study represent only (37.9%) of the participants.

In this study suicidal ideation was significantly associated with unemployed participants (P value 0.003) this finding supported by Supa Pengpid in his study in South Africa (2020) [48] and Mohamed Wani in India (2017) [49], the reasons for that may be due to financial difficulties and family conflicts that caused by unemployment. [54]

The results of current study showed significant associations between suicidal ideation and the duration of diagnosis (P value 0.029) there was high scores in the first five months of the diagnosis, this results supported by Mohammad Wani in India (2017) he found suicidal ideation is highly associated with duration of diagnosis less than one year [49] and Godfrey Rukundo found that newly diagnosed HIV patients having higher proportions with suicidality than those who had lived longer time with the infection [35], this may be because patients became in high stress when they newly diagnosed with HIV according to Amiya et al. study in Nepal the associated stress with suicidal ideation is increased in the early duration of the diagnosis of HIV patients because of inadaptation and the low effect of coping mechanism which then improved overtime [55]

On the other hand Youdiil Ophinni et al. in his study in Indonesia (2020) found no significant association between suicidal ideations and duration of illness these differences may be explained by their small sample size (86 participants) and the majority of patients in his sample were diagnosed by HIV for more than two years. [39]

In this study there were significant association between suicidal ideation and WHO clinical stages (P value 0.000), it was in (45.5%) of stage 4 patients and then (21.7%) of stage 3 patients this may be because the latent stages of HIV are characterized by serious diseases like brain infections and Kaposi sarcoma in stage 4 and chronic diarrhea and pulmonary TB in stage 3, this result supported by Etsay Gebremariam study he found significant associations between suicidal ideation and WHO clinical stage 4 (P Value 0.001) [50], and this results also advocated by Koku Tamirat study in Ethiopia (2021) he reported significant association between suicidal ideations and stage 3 and 4 [51]. this may be explained by the effect of opportunistic infections on the quality of life of HIV patients Palwe et al in his review in India (2018) reported a significant association between the physical domain of quality of life and the opportunistic infections. [52]

In this study no significant associations between suicidal attempt in the last month and the different sociodemographic variables this result replicated by Ahmad Anari study in Iran (2015) [53]. On the other hand many studies show significant association between suicidal attempts and gender, Etsay Gebremariam et al. reported significant association between gender and suicidal attempts [50], Mohammad Wani Mentioned significant association with gender, occupation and marital status [49], and Kefyalew Gizachew explored significant association between suicidal attempts and low income. [31] These differences may be due to few numbers of female in our study and using different tools.

Regarding clinical variables our study showed significant association between suicidal attempt in the last month and opportunistic infections (P Value 0.001) it is associated with 14.3% of patients with TB and respiratory infections, this result supported by Bitew et al. [29] and Wonde M. et al in Ethiopia [47], this might be explained by the burden of opportunistic infections in HIV patients physically and psychologically.

This study showed significant association between lifetime suicidal attempt and marital status (P value 0.010) high incidences in widowed (28.5%), this supported by Nooshi Zari [38], this may be due to social support in married while stressful life in being alone.

This study showed significant association between lifetime suicidal attempt and opportunistic infections (P Value 0.034), It was reported in (50%) of patients with TB and Herpes zoster, (18.2%) of patients with fungal and herpes zoster, (14.2%) of TB and respiratory and (11.1%) of patients with Herpes zoster alone. These results are replicated by Bitew et al. [29] and this might be because the opportunistic infections increased the disability of the HIV patients.

## 7. Conclusion

The finding of this result demonstrated that about (14.5%) of HIV patients had suicidal ideation in the last month, (0.4%) had a suicidal attempt in the last month and (4.3%) had a suicidal attempt in their lifetime.

The study reported that (2.5%) of HIV patients had a severe suicidal risk, (10.6%) had moderate risk and (12.7%) had a low suicidal risk.

Suicidal ideation and attempt were significantly associated with un married status, un employment, WHO stage 3 and stage 4, early duration of diagnosis and opportunistic infections.

## 8. Recommendations

Mental health services need to be elaborated in the VCT centers by involving Psychiatrists to the centers and increasing the Number of the Psychologists and training them for early detection and management of suicidal risk and any related psychiatric disorders.

The counseling sessions must be concentrated specially in the first months of the diagnosis and the advanced stages of HIV.

Early diagnosis and treatment of the opportunistic infections need to be considered by the VCT center physicians.

Social, financial support and employment for HIV patients is important to reduced suicidal behavior.

Adequate training about suicidal risk assessment and interventions need to be conducted to the health care professionals in the HIV centers.

Increasing the awareness of the VCT centers Staff (specially the nurses and Psychologists) and the patients about the Suicidal risk in HIV patients and the importance of early detecting and starting management.

Further studies need to be conducted regarding the suicidal ideation and attempt in HIV patients to focus on comorbid mental illness and the associated psychosocial factors.



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