



Research Article

Knowledge and Attitude Regarding HIV/AIDS and Universal Testing and Treatment Strategy in some Selected Communities in Fako Health Districts of Cameroon

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Abstract

Background: HIV/AIDS has emerged as a serious public health threat across the world, especially in developing countries. To attain the 90-90-90 targets and bring the pandemic under control by 2030, Comprehensive knowledge and positive attitudes are cornerstones for the prevention, control, and treatment of HIV/AIDS.

Objective: The objective of this study was to access the knowledge and attitude level of participants towards HIV/AIDS and Universal testing and treatment strategy Fako health districts, Cameroon.

Methods: This was a community based cross sectional study with a sample size of 1501

participants who were randomly selected within 8 communities. Data were collected electronically with android phones/Tablets by researcher through face-face interviews. The questionnaires had 15 items in 2 dimensions, Knowledge and attitude regarding HIV/AIDS and Universal testing and treatment strategy. Data were analyzed using descriptive statistics and logistic regression model.

Results: The mean age of the participants was 29 years, Majority (58.8%) of the participants were males while 797 (53.1%) of the participants had secondary education level. Also, Christians constituted 96.7% of the study population. Only 599 (39.9%) had heard of University test and treatment of HIV/AIDS and among which only 67(12.6%) knew what this means. Overall, 940(62.6%) had correct knowledge on HIV/AIDS and Universal testing and treatment strategy. Those with overall positive attitude towards HIV/AIDS and Universal testing and treatment strategy constituted 1140 (76%) of the study population. Predictors of positive attitudes were: Education level, knowledge level, health districts, Income level and history of having 2 or more sexual partners in the past 12 months. Participants who had tertiary level of education were 6.9 times more likely to have positive attitude towards HIV/AIDS and Universal testing and treatment compared to those with no level of education (AOR=6.91, 95% CI: 3.89-10.21), The study also revealed a positive correlation between knowledge and attitude, Participants who had correct knowledge were 4.1 times more likely to have positive attitude (AOR:4.11, 95%CI: 2.34-8.99). Participants within Buea health districts were less likely to have a positive attitude compared to the other facilities (AOR:0.25 95%CI: 0.02-0.06).As per the level of income, the findings

revealed that participants with monthly income of <5000 FCFA were 3.4 times more likely to have positive attitude compared to those with higher monthly income (AOR:3.44, 95%CI: .95% CI 2.78-6.34).Also participants who reported not to have had multiple sexual partners in the past 12 months were 4.1 times more likely to have positive attitude compared to those who reported to have heard multiple sex partners in the past 12 months (AOR: 4.1, 95% CI: 5.78-312.4)

Conclusion: The findings showed that majority of the participants had correct knowledge and attitude regarding HIV/AIDS and Universal testing and treatment approach. Predictors of positive attitude towards HIV/AIDS and Universal testing and strategy include: Education level, knowledge level, health districts, Income level and history of having multiple sex partner in the past 12 months.

Keywords: Knowledge; Attitude; HIV/AIDS; Universal testing and treatment approach; Fako health districts

Abbreviations

HIV= Human Immunodeficiency Virus

AIDS= Acquired Immunodeficiency Syndrome

UTT= Universal Testing and Treatment

AOR= Adjusted Odd Ratio

COR= Crude Odd Ratio

1. Introduction

Testing for HIV is a gateway to treatment, care and prevention [1]. Awareness to HIV status is usually the primary step that leads to health care seeking behavior in HIV care services [2]. This has been advocated in

many countries not only as a potential preventive tool but also as a major way to destigmatize and normalize HIV in the entire world [2]. Findings from several studies have revealed that many strategies have been used to increase the uptake of HIV testing and treatment but despite all the strategies in place, testing and treatment of HIV/AIDS remains low [3]. Recent estimates based on survey done in 18 high HIV-prevalence sub-Saharan African countries revealed that only 34% of women and 17% of men had ever been tested for HIV in the general population and have received their results. Another study in south Africa revealed that less than a quarter of 15-49 years old in sub-Saharan Africa know their status [4].

According to the Cameroon Demographic and Health Survey and Multiple Indicators Cluster Surveys (DHS-MICS) conducted by the “National Institute of Statistics” (NIS) in collaboration with the Ministry of Public Health HIV prevalence in Cameroon was 4.3% in 2011[5]. However, following the Cameroon population based HIV impact assessment, the prevalence has dropped from 4.3% in 2011 to 3.7% in 2018. Cameroon still has the highest burden of HIV in West and Central Africa (WCA), with an estimated 620,000 PLHIV, projected to increase to 726,000 by 2020 [6].

In the Fako division of Cameroon, increasing access to HIV testing and treatment has been an essential activity. In recent years, much progress has been made to increase the coverage and uptake of HIV services in many areas through the provision of vertical integrated services; client-initiated testing (voluntary counselling and testing) and provider-initiated HIV counseling and testing (HCT). Despite all the efforts made, the rate of new HIV infections in

this division and in Cameroon remain high while the uptake of these services remained generally low [7].

In 2015 the World Health Organization (WHO) issued updated guidelines recommending immediate ART for all HIV-positive individuals, regardless of CD4 count [7]. However, testing everybody and providing treatment to those who test positive was only implemented in Cameroon in 2016. Universal Testing and Treatment (UTT) involves offering HIV testing to everybody that comes to the hospital for consultation and then putting those who test positive on Antiretroviral treatment (ARTs) irrespective of their clinical stage or CD4 count [8]. The rationale behind this strategy is that it will help more people find out if they are infected with HIV earlier, and that is when treatment work best, it will also decrease the number of babies born with HIV, reduce morbidity and mortality due to HIV, stigma associated with HIV testing and will enable those who are infected to take steps to protect the health of their partners and hence break the chain of transmission [9, 10]. However, Mathematical modeling has also shown that UTT could lead to drastic reduction in HIV incidence and possibly eliminate HIV as a public health problem over a period of 15-20 years as well as reduce HIV-related morbidity and mortality [10]. Therefore, for UTT approach to be a successful and produce the desired effect, it is necessary to assess the Knowledge and attitude level of members of the community on HIV/ADS and Universal testing and treatment strategy (UTT).

2. Materials and Methods

2.1 Study design and setting

This was a community based cross sectional study that was conducted in 8 randomly selected

communities within Fako health districts. These communities include, Upper kostain and modeka in Tiko health district, Sandpit, and Mile 16 in Buea

Health district, Munyenge in Mayuka health district, Batoke, Watutu, and Idenau in Limbe health district (Figure 1).

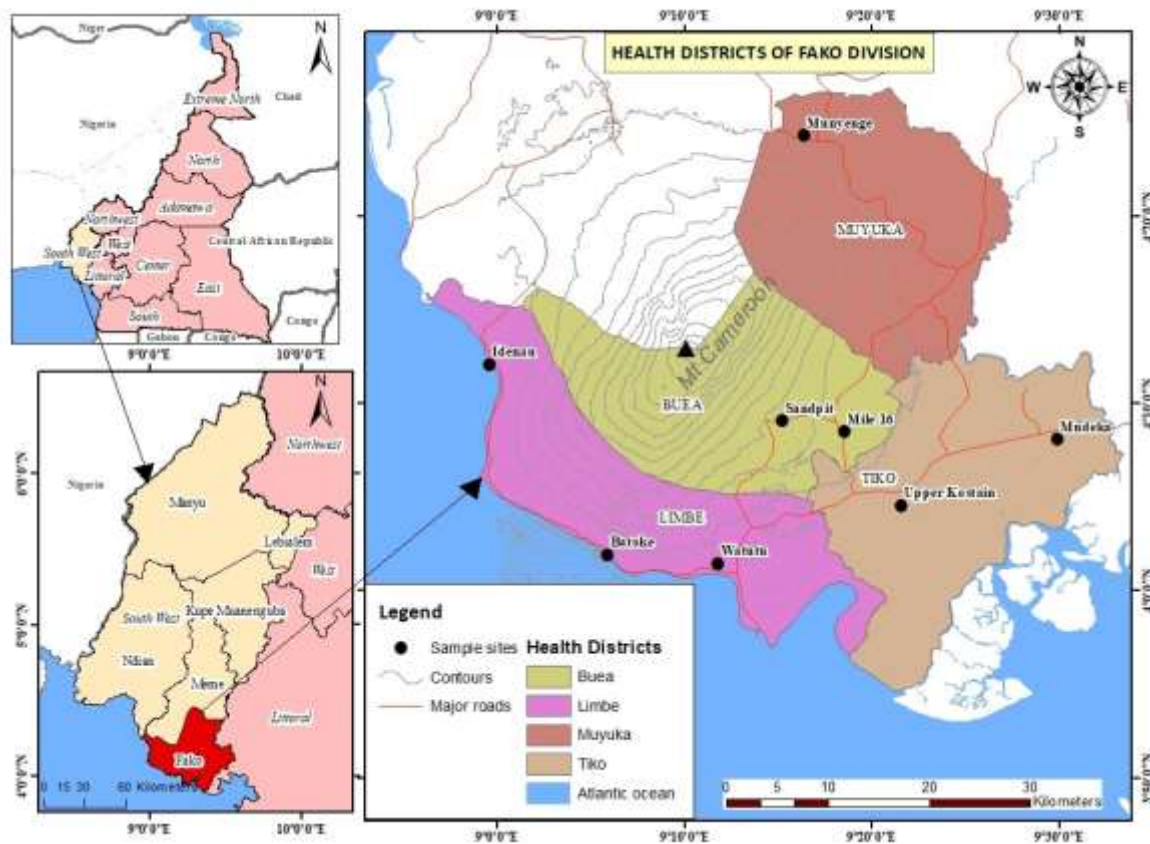


Figure 1: Map showing the study communities.

2.2 Study population

The study population involved members of the selected communities who were of age 18 years and above and who gave their verbal or written consent to participate in the study.

2.2.1 Inclusion and exclusion criteria

Inclusion criteria: Community members who were 18 years and above and accepted to take part in the study verbally or through a written consent were included in the study

Exclusion criteria: Community members who were below the ages of 18 and those who did not give consent including those who were sick were excluded from this study.

2.3 Sampling size calculation and sampling technique

The sample size was calculated using the single population proportion formula by karimollah,2011 [11].To adjust for the design effect of the sample design, the sample size was multiplied by the design

effect. Hence, Z-score=1.96; Proportion= 50% marginal error=0.05, Design effect=3.5 and non-response rate=10%.

$$n = \frac{Z^2 * p * (1-p)}{e^2} * 3.5$$

$$n = \frac{(1.96)^2 * 0.5 * 0.5}{(0.05)^2} * 3.5 = 1344$$

Therefore, the Minimum sample size was 1344 participants but finally a total of 1501 participants

were recruited into the study. The number of communities selected in each health districts and number of participants sampled in each health districts were determined based on the probability proportionate to size technique taking into consideration the overall number of communities and the population size respectively (Tables 1 and 2). The sampling technique deployed in this study was simple randomly sampling where all community members had equal opportunities of being selected.

Table 1: Number of communities sampled based on probability proportionate to size, Fako health districts, 2018.

Health districts	Number of communities (clusters)	Number of community(ies) Sampled
Buea	95	2
Tiko	109	2
Muyuka	45	1
Limbe	121	3
Total	367	8

Table 2: Number of participants sampled per Health district base on probability proportionate to size , 2018.

Health district	Total population	Targeted population	Number sampled
Buea	173526	95439	409
Limbe	198516	109184	468
Muyuka	151400	83270	357
Tiko	113491	62420	267
Total	636933	350313	1501

2.4 Data collection tool and procedures

The data collection tool was a semi structured questionnaire that was designed using Epicollect5 a mobile application that is used to collect data electronically using Android mobile phones or tablets. The questionnaire consisted of three sections: Section A consisted of participants’ sociodemographic and

socioeconomic characteristics meanwhile section B consisted of 10 knowledge related questionnaires on HIV/AIDS and universal testing and treatment strategy and section C consisted of 5 attitude questions. The response options of the questions were *yes, No* and *I don’t know*. One thousand five hundred and one (1501) structured questionnaires were

administered in the selected 8 villages within the 4 Health districts. The data was collected by 11 trained research assistants, all of which were final year master students in Epidemiology. After training a pre-test was done in Tole community, a community different from where the study was to be implemented.

2.5 Data analysis

All analyses were conducted using SPSS version 25. The analysis examined the knowledge and attitude level of participants on HIV/AIDS and Universal testing and treatment strategy. Descriptive statistics were used to analyze the sociodemographic characteristics of participants and their knowledge and attitude level on HIV/AIDS and UTT. The knowledge assessment was based on 10 point questions with *Yes*, *No* and *I don't know* responses. However, participants who had the correct respond were scored 1 and those with incorrect response were scored 0 and the sum score of each participant was generated. The mean score for all the participants was calculated and participants who scored below the mean score were considered to have incorrect knowledge on HIV/AIDS and UTT and those whose scores were above the mean score were considered to have correct knowledge on HIV/AIDS and UTT. Similarly, the overall attitude level of the participants was assessed based on 5 point questions with *yes* and *No* options. In each question, participants who had correct answer were scored 1 while those with incorrect answer were scored 0. The sum score for each participants was calculated. The mean score for all the participants was calculated and participants who scored below the mean were considered to have Negative attitude while those who scored above the mean were classified as having positive attitude. To assess the relative contribution of each predictor variables, a logistic

regression analysis was carried out. Univariate logistic regression analysis examined the association between these variables and positive attitude towards HIV/AIDS and Universal testing and treatment. This allowed for the understanding the effect of each independent variable without controlling for confounding variables. Variables that were significant at the bivariate analysis were subjected to multivariate analysis to eliminate confounders. Associations between the outcome and independent variables were assessed using odds ratios at 95% confidence interval limits and all statistical significance were set at $P < 0.05$.

2.6 Ethical and administrative approval

After developing the research protocol, the investigator obtained ethical approval from the University of Buea Institutional Review Board (IRB). Administrative authorisation was received from the Regional Delegation of Public Health for South West and other local administrative and traditional authorities within the study communities. Written/oral consent was obtained from every participant prior to participation.

3. Results

3.1 Socio-demographic and baseline characteristics

A total of 1501 participants were enrolled into this study among which there were 619 (41.2%) males and 882 (58.8%) females. The ages of the participants were categorized into four groups. Majority (41.1%) of them felt within the age group 25-35 years meanwhile 571 (38%) had ages between 15-24 years. However, 197 (13.1%) had ages between 35-44 years meanwhile those who were 45 years and above constituted just 108 (7.2%) of the study population.

The mean of age of the participants was 29years. With respect to educational status, More than half (53.1%) had acquired secondary education whereas 400 (26.6%) reported to have had tertiary education meanwhile those who reported not to have had any formal education and those who had primary education made up 22 (1.5%) and (287) 18.8 % of the study population respectively .A vast majority (96.7%) of the study participants were Christians. As per marital status of participants, 622 (41.4%) were either married or cohabitating meanwhile those who were single constituted 826 (55%) of the study population. Widows/widowers and those who had divorced/separated made up 36 (2.4%) and 17 (1.1%) of the study population, respectively. As concerns

occupation, 538 (35.3%) reported Business as their main occupation, however 420 (28%) of the study participants were students meanwhile those who were farmers and civil servants constituted 141 (10.1%) and 64 (4.3%) respectively.

Also 209 (13.9%) reported to have been working in private sector whereas 127 (8.5%) reported that they were jobless. More than half (57.2%) of the participants reported to have monthly earnings less than 50000FCFA. 502 (33.4 %) of the participants reported to have monthly income between 50000-100000FCFAand only 59 (3.9%) have monthly income of more than 200000FCFA (Table 3).

Table 3: Sociodemographic characteristics of study participants, Fako health districts, 2018.

Variables	Frequency(n=1501)	Percentage (%)
Gender		
Males	619	58.8
Females	882	41.2
Age		
15-24	571	38
25-34	625	41.6
35-44	197	13.1
45+	108	7.2
Educational level		
No formal education	22	1.5
Primary education	282	18.8
Secondary education	797	53.1
Tertiary education	400	26.6
Religion		
Christians	1451	96.7
Muslims	32	2.1
Others	18	1.7
Marital status		
Married/cohabiting	622	41.4
Separated/divorce	17	1.1
Single	826	55
Widow/widower	36	2.4
Occupation		
Business	530	35.3
civil servant	64	4.3
Farmer	141	10.1
Private sector	209	13.9
student	420	28.0
unemployed/no job	127	8.5
Income level/ FCFA		
< 50000	858	57.2
50000-100000	502	33.4
101000-200000	82	5.5
>200000	59	3.9

3.2 knowledge level of participants on HIV/AIDS and universal testing and treatment strategy

Participants’ knowledge on the cause of AIDS, its transmission, prevention and treatment was assessed based on 10-point questionnaire. As to what causes

AIDS, almost all 1483 (98.8%) of the participants knew that AIDS is caused by a virus whereas a few 18 (1.2%) did not know what causes AIDS. With respect to HIV transmission, 1418 (94.5%) of participants reported that they know how HIV can be transmitted

from one person to another. However, as to whether HIV can be transmitted by mosquitoes, 836 (55.7%) participants said mosquitoes cannot transmit HIV while 450 (30%) agreed that HIV can be transmitted by mosquitoes and on the other hand, 215 (14.4%) simply reported that they do not know if mosquitoes can transmit HIV or not (Table 4).

Also, almost all 1374 (91.8%) participants knew that somebody could look physically healthy but infected with HIV as they reported that healthy carriers do exist. However, some people still believe that somebody can be infected with HIV if he shares a meal with HIV infected persons as 11.2% of the participants in this study reported that HIV can be transmitted by sharing a meal with HIV infected person. As to whether condoms can reduce the

chances of HIV transmission, 1050 (70%) agreed that condom can minimize the chances of HIV transmission when correctly used but 371 (24.7%) of the participants hold that Condoms do not minimize the chances of HIV transmission. 1152 (76.7%) reported that the risk of HIV infection can be reduced by having sex with only one uninfected partner. As to whether there is treatment for HIV/AIDS, 1124 (74.9%) reported that there is a treatment for HIV while 371 (17.9%) reported that the treatment for HIV does not exist and 109(7.1%) did not know whether treatment exist or not .Majority (60.1%) of the participants had never heard of the universal testing and treatment of HIV/AIDS. Among those who had heard of universal testing and treatment, only 67 (12.6%) knew what its meaning (Table 4).

Table 4: knowledge level of participants on HIV/AIDS and universal testing and treatment strategy, Fako health districts, 2018.

Statement	Frequency(N=1501)	Percentage (%)
Have heard of AIDS (n=1501)		
Yes	1483	98.8
No	18	1.2
knows how HIV is transmitted (n=1501)		
Yes	1418	94.5
No	83	5.5
HIV can be transmitted by mosquitoes (n=1501)		
Yes	450	30.0
No	836	55.7
I don't know	215	14.4
Can healthy looking person be infected with HIV (n=1501)		
Yes	1374	91.8
No	93	6.2
I don't know	20	2.0
Somebody can get HIV by sharing meal with HIV patient (n=1501)		
Yes	168	11.2
No	1243	82.8
I don't know	90	6.0
Use of condom reduce the chance of HIV transmission (n=1501)		
Yes	1050	70.0
No	371	24.7
I don't know	80	5.3
Risk of HIV infection can be reduced by having sex with only one uninfected partner (n=1501)		
Yes	1152	76.7
No	308	20.0
I don't know	41	2.7
There is a treatment for HIV (n=1501)		
Yes	1124	74.9
No	268	17.9
I don't know	109	7.1
heard of universal test and treat of HIV (n=n=1501)		
Yes	599	39.9
No	902	60.1
Know what Universal test and treat means (n=597)		
Yes	67	12.6
No	532	77.4

3.3 Attitude of participants on HIV/AIDS and the universal testing and treatment strategy

The attitude of participants towards HIV/AIDS and the universal testing and treatment approach was accessed based on five questions with *Yes* or *No* responses. With regards to accepting an HIV test when ask to do so, almost all 1392 (93.2%) of the participants agreed that they will undertake an HIV when they are offered. On the contrary 102 (6.8%) said they will not accept to do an HIV test when asked to, indicating that they are not interested in knowing their status as they have not been exposed.

With regards to encouraging people to do HIV test, a vast majority 1182 (87.5%) accepted that they will encourage people to do their HIV test as testing for HIV is one of the major steps to HIV prevention While 169 (12.5%) said it’s not their responsibility to encourage people to do HIV test as testing for HIV is a personal decision. Considering the sites for an

HIV test and the person who does it, 845 (62.5%) of the participants reported that the sites and the person who does the test do not affect their decision to take the test as they can do the test anywhere and by any medical personnel and not specific people at specific places. However, as much as 506 (37.4%) of the participants reported that they cannot just do HIV test anywhere by anybody and they prefer to do it in the hospital. As concerns disclosing positive results to partner, 1145 (82%) agreed that they will disclose positive results to partner so they can also do their own test and know their status. 252 (18%) said they will not disclose their results to partner because HIV test is something confidential and one should keep it to him or herself. As to whether participants will accept to take drugs following positive results, almost all 11349 (97%) reported that if they are tested HIV positive, they will take drugs as this will make them healthy and live longer (Table 5).

Table 5: Attitude level of participants on HIV/AIDS and universal testing and treatment strategy Fako health districts, 2018.

Statement	Frequency (%)	Percentage (%)
Accept to do HIV test when ask to (n=1494)		
Yes	1392	93.2
No	102	6.8
Encourage somebody to do HIV test(n=1391)		
Yes	1182	87.5
No	169	12.5
Site affects decision to take HIV test(n=1352)		
Yes	506	37.4
No	845	62.6
Disclose results to partner (n=1397)		
Yes	1145	82
No	252	18
Take drugs when positive (n=1391)		
Yes	1349	97
No	42	3

3.4 Overall level of knowledge and attitude of participants on HIV/AID and universal testing and treatment strategy

After assessing participants knowledge and attitude based on individual questions, the overall level of participants knowledge and attitude on HIV/AIDS and UTT strategy was determined, With respect to knowledge, there were 10 questions assessing the level of knowledge of participants on HIV/AIDS and UTT, each of these questions had *Yes, No and I don't know* response options. However, participants who had the correct respond were scored 1 and those with incorrect response were scored 0 and the sum total score of each participant was generated. The mean score for all the participants was calculated and participants who scored below the mean were considered to have incorrect knowledge on HIV/UTT and those whose scored were above the mean score

were considered to have correct knowledge on HIV/AIDS and UTT. As such, 62.6% of the participants had correct knowledg on HIV/AIDS and UTT whereas those who had incorrect knowledge made up 37.4% of the participants. Similary, the overall attitude of the participants was assessed based on 5 questions with *yes and No* anwer options In each question, .participants who had correct answer were scored 1 while those with incorrect answer were scored 0. The mean score for all the participants was calculated and participants who scored below the mean were considered to have Negative attitude while those who scored above the mean were classified as having positive attitude. In this regard, 1140 (76%) of the participants had positive attitude to HIV/AIDS and Universal testing and treatment stategy while 940 (62.6%) had cprrect knowledge on HIV/AIDS and UTT (Table 6).

Table 6: Overall level of knowledge and attitude of participants on HIV/AIDS and universal testing and treatment, Fako health districts,2018.

Variable	Level	Mean Score	n=1501	%
Knowledge	Correct knowledge	≥ 4.10	940	62.6
	Incorrect knowledge	<4.10	561	37.4
Attitude	Positive attitude	≥2.41	1140	76.0
	Negative attitude	<2.41	361	24.0

3.5 Predictors of positive attitude towards HIV/AIDS and universal testing and treatment strategy

In determining predictors of positive attitude towards HIV/AIDS and Universal testing and treatment strategy, a logistic regression model was

deployed whereby different variables were subjected into to the model for bivariate logistic regression analysis and Crude Odd Ratios (COR) were determined at 95% Confidence interval and variables that were statistically significant (P<0.05) were further subjected to multivariate logistic analysis and

Adjusted Odd ratios (AOR) were also determined. Factors significant at multivariate analysis were: Educational level, self-risk perception, participants knowledge level on HIV/AIDS and UTT Health districts, history of having 2 or more sexual partner in the past 12 months and income level. With respect to educational level, participants who had tertiary level of education were 6.9 times more likely to have a positive attitude towards HIV/AIDS and UTT approach compared to those who had no formal level of education. In the same line, individuals who had high self-risk perception were 3.9 times more likely have a positive attitude towards HIV/AIDS and UTT

strategy compared to those who reported low risk perception .As per the level of knowledge on HIV/UTT strategy, participants who have correct knowledge were 4.1 times more likely to have positive attitude as opposed to those with incorrect knowledge. However, participants from Buea health district were 0.25 times less likely to have a positive attitude compared to those from Tiko. The study also revealed that participants who reported to earn monthly income of less than 50000 FCFA were 3.4times more likely to have a positive attitude compared to those earn more 200000 FCFA (Table 7).

Table 7: Predictors of positive attitude towards HIV/AIDS and universal testing and treatment strategy, Fako health districts, 2018.

Variables	Positive attitude(n=1129)	COR (95%CI)	AOR (95% CI)
Gender			
males	454	1	-
Females	675	1.19(0.93-1.05)	-
Age			
45+	85	1	-
35-44	136	0.60(0.35-1.10)	-
25-34	468	0.81(0.49-1.50)	-
15-24	440	0.91(0.55-1.45)	-
Educational level			
No school	19	1	1
primary	249	2.91(2.24-3.78)*	2.81(2.41-4.22)
secondary	633	5.67(3.76-8.61)*	5.11(2.88-9.34)
Tertiary	228	6.22(4.21-9.82)*	6.91(3.89-10.21)*
Marital status			
Widow(er)	29	1	-
single	608	0.67(0.29-1.56)	-
Separated	11	0.44 (0.12-1.62)	-
Married	581	1.21(0.12-12.04)	-
Occupation			
unemployed	96	1	-
Students	313	0.94(0.60-1.50)	-
Private	176	1.72(0.94-2.98)	-
farmers	110	0.87(0.50-1.41)	-
Civil servants	38	0.47(0.25-0.90)	-
Business	396	0.95(0.61-1.50)	-
Self-Risk perception			

Low risk perception	611	1	1
High risk perception	518	4.1(1.52-8.33)*	3.9(1.45-8.44)*
Knowledge level			
incorrect knowledge	566	1	1
Correct knowledge	563	4.6(2.44 -9.32)*	4.1(2.34-8.99)*
Health district			
Tiko	251	1	1
Muyuka	334	0.93(0.48-1.79)	0.83(0.34-1.74)
limbe	422	0.59(0.34-1.05)	0.60(0.32-1.22)
Buea	122	0.27(0.02-0.05)*	2.11(1.11-3.33)*
Have had 2 or more sexual partner past 12 months			
Yes	264	1	1
No	865	4.23(5.97-313.7)*	4.11(5.78-312.4)*
Income level/FCFA			
>200000	36	1	1
101000-200000	54	1.23(0.62-2.45)	1.22(0.55-2.84)
50000-100000	321	1.13(0.65-1.97)	1.11(0.63-1.75)
<50000	718	3.27(1.88-5.70)*	3.44(2.78-6.34)*
Religion			
Others	16	1	-
Muslims	20	0.21(0.04-1.07)	-
Christians	1093	0.38(0.09-1.67)	-

COR: Crude Odd Ratio, AOR: Adjusted Odd Ratio, *Statistically significant

4. Discussion

4.1 knowledge level of participants on HIV/AIDS and Universal testing and treatment strategy

This study was aimed at assessing the knowledge and attitude level of participants on HIV/AIDS and Universal testing and treatment strategy. Participants’ knowledge on the causes, transmission, prevention, and treatment of HIV/AIDS was assessed using structured questionnaires. With respect to causes of HIV/AIDS, A vast majority (98.8%) of the participants reported to have heard of HIV/AIDS. Also, Majority (94.5%) of the respondents also reported that they know how HIV can be transmitted from one person to another. These findings are similar to that of a study carried out in Ghana among University students [12]) .Surprisingly, as much as much 30% of the study participants still believed that mosquitoes transmit HIV/AIDS. This is very similar to

a study conducted in Nepal by Dhungel *et al* where 32% of the participants reported that HIV can be transmitted by mosquitoes [13] meanwhile another studies carried in Rwanda also showed that 10% of the participants believe that HIV can be transmitted by mosquitoes [14]. Also, almost all participants knew that somebody could look physically healthy but infected with HIV/AIDS and could transmit the virus to others. On the contrary, a study carried in Nepal reported that more than half of the participants believed that healthy looking individuals cannot be infected and consequently cannot infect others [13]. As to whether condom can prevent the transmission of HIV ,majority of the participants agreed that condom can prevent the transmission of HIV when correctly used. This findings align with studies carried out by Dzah *et al* among high school students in Ghana [15]. As concerns HIV treatment , a vast majority of the respondents were knowledgeable that

HIV/AIDS can be treated though they did not know how these drugs are called. These findings are in the line with a study conducted by Mihaja *et al* in Madagascar where majority of the respondents reported that HIV/AIDS can be treated [16]. This study also revealed that majority of the participants did not know what UTT means and have never heard about it as they did not know that testing and treatment now is systematic. In general, the overall participants knowledge on HIV/AIDS and UTT was 62.6%. However, these findings differ from findings reported by Shirim and Ahmed where they noted that only 56.1% of their participants had correct knowledge on HIV/AIDS and Universal Testing and treatment [17].

4.2 Attitude of participants towards HIV/AIDS and the universal testing and treatment strategy

The attitude of participants towards HIV/AIDS and the universal test and treat approach was assessed. The findings showed that Almost all (93.2%) of the participants agreed that if they are offered HIV test, they will accept and even go ahead to encourage somebody to go for voluntary testing. This is contrary to a study conducted in Southern Ethiopia [18] where only 68.8% reported they will accept to take an HIV test when offered. This difference could be attributed to the knowledge level of participants in the different studies. In this study the overall correct knowledge level of participants regarding HIV/AIDS and UTT was 78.6% as opposed to 67.4% reported in southern Ethiopia. This study has shown an association between participants' knowledgeable level and acceptability of HIV testing and treatment. This means that Participants with correct knowledge level had higher odds of accepting HIV testing and treatment when tested positive. This coincides with

findings reported by Lucy Chimoyi *et al* in south Africa [19]. Also, as to whether HIV testing site affects decision to take an HIV test, 37.4% reported that they cannot take an HIV anywhere, they preferred specific places to take their test. More than half (51.2%) of the participants indicated that their testing preference is the hospital. This is in line with studies conducted by Ucheoma Nwazozu *et al* in Nigeria where 69% of the participants reported that they prefer to be tested in the hospital [20]. As concerns results disclosure to partners, majority (82%) reported that they will disclose their results to partner if tested positive. This is higher than the findings reported in south Africa where only 58.4% agreed to disclose their positive results to partners [21]. The difference could be attributed to the differences in the targeted population, while this study targeted randomly selected individuals within the communities, the study in South Africa was limited to pregnant women who were attending their first ANC. Also almost all participants showed willingness to accept treatment if tested positive for HIV/AIDS and explained that positive HIV patients can only stay longer if they take their medications regularly. In general, 76% of the participants had a positive attitude towards HIV/AIDS and Universal testing and treatment. These findings are in line with studies conducted in Ethiopia among University students [22]. However, as much as 34% of the participants had negative attitudes towards HIV/AIDS and universal testing and treatment as they reported that they will turn down the test when offered, while others reported that if they carry out the test and it is positive, they will not tell their partners as they claim their result are personal and should not be shared with anybody not even their partners. These findings coincide with findings in Tanzania where among those with poor attitudes, majority

reported that they will not take the test while other said even if they do the test and it comes out positive , nobody will be informed about as it their personal information [23] similar findings were reported in Tanzania where participants where some reported that they will not disclose their positive results to anybody not even to their partners.

4.3 Predictors of positive attitude towards HIV/AIDS and universal testing and treatment strategy

Our analysis showed that parameters that were significantly associated with good attitudes of participants towards HIV/AIDS and Universal testing and treatment were Educational level, HIV self-risk perception, participants knowledge level on HIV/AIDS and UTT , Health districts, history of having 2 or more sexual partner in the past 12 months and income level. With respect to educational level, participants who had no formal education were 6.9 times more likely to have a positive attitude towards universal test and treat approach compared to those who had tertiary education .This is in contrast with studies conducted in Zambia where participants with formal education had higher odds of having positive attitudes towards. HIV/AIDS and UTT compared to those with no formal education level [24]. Also, As per the level of knowledge on HIV/AIDS and UTT strategy, participants who had correct knowledge were 4.1 times more likely to have positive attitude as opposed to those with incorrect knowledge. multiple studies have demonstrated an association between HIV/AIDS knowledge and attitudes towards [16, 25, 26].This findings are in line with studies conducted in south Africa where participants with correct knowledge level had higher odds of adopting a good attitude towards HIV/AIDS and UTT [25].

However, participants from Buea health district were 2.11 times more likely to have a positive attitude compared to those from Tiko. This could be explained by the fact the communities that were selected for this studies in Tiko were more remote and majority of the participants were farmers with low level of education hence low level of knowledge on HIV/AIDS and UTT meanwhile Buea harbors mostly students and civil servants with high level of education and knowledge of HIV/AIDS and UTT hence this plays positivity on their attitude towards HIV/AIDS and UTT. Also participants who reported to earn monthly income of less than 50000 FRS (<\$85) were 3.4times more likely to have positive attitude towards HIV/AIDS compared to those who earn more than 200000 FRS (>\$333).This could be explained by the fact that participants monthly income of less than \$85 per month are more conscious of the financial consequences of HIV/AIDS as compared to those with more than \$333.

5. Conclusion

The level of knowledge regarding HIV/AIDS causes, transmission, prevention and treatment was considered satisfactory though majority of the participants had no information of on the testing and treatment approach Also ,some misconceptions about HIV transmission, risky behaviors and discriminatory attitudes were observed among participants that call for concern and must be addressed promptly. Regular education talks within the communities and in schools, should be reinforced to correct the misconceptions observed in this study and encourage positive attitudes towards PLHIV.

Declaration

Ethics Approval and Consent to Participate

All the principles of a good ethical research were respected. Ethical approval was obtained from the Institutional Review Board of the Faculty of Health Sciences of the University of Buea and during data collection, participants approval was sought prior to data collection.

Consent for Publication

Not applicable.

Availability of Data and Material

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

KEN and NNM developed the study conception and design. KEN, NNM, DSN wrote the manuscript and contributed in the analysis and interpretation of the data. VVS, EOG contributed in the critical revision of the intellectual content of the manuscript. All the authors read and approved the final manuscript.

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