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Sexual and Reproductive Health Service Utilization and its Impact on ART Adherence, Viral Suppression, and Reproductive Health Decisions Among Young People Living with HIV in the Northwest Region of Cameroon

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Abstract

Background: Cameroon has 50,000 YPLHIV and there is limited knowledge on their use of SRH services and its impact on health outcomes. This study investigated the impact of sexual and reproductive health (SRH) service utilization on antiretroviral therapy (ART) adherence, viral suppression, and reproductive health decisions among young people living with HIV (YPLHIV) in the Northwest region of Cameroon.

Methods: A cross-sectional study was conducted using a sequential sampling of adolescents and young adults living with HIV. Structured questionnaires were used to collect data between February and April 2022 from 340 participants, aged 15-24 years in 16 HIV care and treatment sites in the Northwest Region of Cameroon. The data was cleaned and analyzed using Stata version 14.0.

Results: Our findings revealed that 58% of participants utilized SRH services, with associations found between high SRH service utilization and improved ART adherence (85% adherence among those with good SRH service utilization) and viral suppression (96% suppressed viral load). Barriers to SRH service uptake included being a male, urban residence, and lack of schooling, while good SRH knowledge significantly facilitated access. Additionally, the majority of unmarried participants expressed desires to marry (87%) and have children (90%).

Conclusion: This study highlights the crucial role of sexual and reproductive health service utilization in enhancing health outcomes among adolescents living with HIV. The findings indicate that access to SRH services was associated to improved adherence to antiretroviral therapy and higher rates of viral suppression. Additionally, the desire for marriage and children among YPLHIV underscores the need for supportive SRH services tailored to their unique needs. However, barriers such as gender, place of residence, and educational status hindered access to these vital services.

Introduction

Despite the over three decades of global efforts to combat HIV/AIDS, it remains a profound and persistent public health challenge. In 2021, approximately 1.8 million adolescents were living with HIV, with a staggering 89% of them residing in sub-Saharan Africa. Within this context, Cameroon was notable for having one of the largest HIV epidemics in the West and Central African sub-region, with a growing number of adolescents and young adults affected by the virus. By the end of 2021, Cameroon reported 50,000

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adolescents and young adults living with HIV, including 1,900 from the Northwest Region alone [1,2]. The rapid advancement and expansion of antiretroviral therapy (ART) have been transformative, allowing many perinatally infected youths to reach adolescence and adulthood. However, this transition into adulthood introduces a range of complex challenges [3]. The developmental period of youth is marked by significant physiological, psychological, and social changes, often leading to increased susceptibility to risky sexual behaviors. Such behaviors not only heighten the risk of unwanted pregnancies and sexually transmitted infections but also complicate ART adherence and viral suppression [4,5]. Sexual and reproductive health (SRH) services play a critical role in addressing these challenges. Access to comprehensive SRH services is essential for adolescents living with HIV, not only for managing their health but also for supporting their future reproductive choices [6]. Research has shown that young people living with HIV (YPLWH) often express desires to marry and have children, yet they face significant barriers, including fears of disclosing their HIV status and concerns about transmitting the virus [6] [7]. In particular, a study conducted in Zambia found that many adolescents living with HIV wanted to have children but lacked knowledge about preventing mother-to-child transmission [8] [9]. This lack of information contributes to anxiety about future relationships and childbearing, highlighting the importance of accessible SRH services [8] [9]. Globally, understanding and meeting the SRH needs of these young people is crucial, particularly in regions like sub-Saharan Africa where early childbearing is common and knowledge gaps about prevention and treatment abound. In Cameroon, particularly in the Northwest Region, there is a pressing need to better understand the intersection of SRH service utilization with ART adherence, viral suppression, and reproductive health decisions among young people living with HIV. Existing literature indicates that stigma, fear of disclosure, and inadequate knowledge often impede access to necessary services [10]. A recent study underscores that many adolescents in urban poor settings express a desire for children but lack essential information about safe reproductive health practices [10].

The primary goal of this study was to evaluate the impact of SRH service utilization on health outcomes, specifically ART adherence and viral suppression, as well as reproductive health choices among adolescents living with HIV in the Northwest Region of Cameroon. Specifically, the study aimed to:

- Determine the extent to which adolescents living with HIV (ALHIV) in the Northwest Region utilize available SRH services.
- Investigate how the use of SRH services influences adherence to antiretroviral therapy (ART) and the status of viral suppression among ALHIV.
- Identify the key barriers and facilitators to SRH service uptake and how these factors interact with ART adherence, viral suppression, and reproductive health decisions.
- Evaluate the impact of SRH service utilization on reproductive health choices and future aspirations related to childbearing and sexual relationships among ALHIV.

The study sought to provide valuable insights into the effectiveness of SRH services in supporting the health and well-being of ALHIV, ultimately informing the development of targeted interventions and policies that address their specific needs. By bridging the gap between SRH service utilization and health outcomes, we can better equip young people living with HIV in Cameroon to make informed reproductive health decisions and enhance their overall quality of life.

Methods

Study design

A cross-sectional study was conducted between February and April 2022 and included a quantitative survey of adolescents (15-19 years) and young adults (20-24 years) living with HIV in the Northwest Region of Cameroon. Participants were recruited from 16 selected HIV care and treatment sites in the region, taking into consideration patient load (at least 15 adolescents and young adults on ART), functional level, diversity of ownership, and setting (rural or urban).

Study Setting

The Northwest region is one of the 10 regions in the country with an estimated surface area of 17,812 km² and a population of about two million inhabitants, predominantly Anglophones. The region comprises of 7 divisions (Bui, Boyo, Donga-Mantung, Menchum, Mezam, Momo, and Ngo-Ketunjia) and 34 sub-divisions. The capital of the region is Bamenda with an urban population of over 550,000 inhabitants. The inhabitants in the region comprise both the natives and immigrants from other regions and neighboring Nigeria with the majority residing in the rural areas. The main economic activities are small-scale farming and livestock which together with the public service serve as sources of employment [11]. Since 2016 till date, the NW and SW have been experiencing a soio-political crisis which is causing a lot of internal displacement as the population moves to safer areas. The health system of the region is under the leadership of the regional delegation of public health that supervises the health districts, and each health district oversees the health activities of a number of health areas. The region has 20 health districts with 244 health areas and a total of 420 health facilities which include the public, private, and confessionals.

Study Population

Target population

The target population for this study was young people living with HIV aged 15-24 years, on ART in 16 selected

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HIV treatment centers in the Northwest Region of Cameroon. Fifteen years was set as minimum age because many young people become sexually active around this age. The maximum age was set at 24 years because the maximum age for one to qualify to be a young adult is 24 years [12] [13]. Service providers were targeted for questions on the availability of sexual and reproductive health services.

Inclusion and Exclusion criteria

All clients within the age group who gave ascent and consent to participate in the study were included. Those who were present at the clinic but were critically sick and those who did not give ascent/consent were excluded from the study.

Sampling technique

A purposeful sampling technique was used to select study sites. This selection took into consideration patient load, desired minimum sample size, functional level, diversity of ownership, location (rural or urban) and accessibility in the context of the ongoing socio-political crisis in the region. The study sites therefore included high (2000+ clients), medium (1500 to <2000 clients) and low volume (<1500) ART treatment centers with at least 15 adolescents and young adults on ART. Facilities with adolescent clinics were equally prioritized for the convenience of meeting the study participants during their clinic visits within a maximum of three months. The study participants from each site were selected using a systematic sampling technique. From the calculated sample size and the estimated study population, every fourth client was selected. Service providers who work closely with the adolescent cohort were equally administered a questionnaire to assess the availability of SRH services at their site. The service providers included nurses/doctors, adolescent champions, psychosocial agents/case managers).

Sample size determination

The sample size for this study was calculated using the Lorentz's formula as follows:

$$n = \frac{Z^2(P)(1-P)}{d^2}$$

Where;

n: Desired sample size

Z: level of confidence at 95% (with value of 1.96)

P: Proportion (Proportion of adolescents and young adults LHIV in the Northwest region of Cameroon and since this is not clearly stated in literature, we used 50% or 0.5)

d: Precision or error margine (If Precsion is 5%, then value of d is 0.05)

Substituting this in the formular;

$$n = \frac{(1.96)^2(0.5)(1-0.5)}{(0.05)^2}$$

$$n = \frac{0.9604}{0.0025}$$

n =384

Therefore, the required number of adolescents and young adults for this study was 384

Data collection

Structured questionnaires containing questions on demographics, utilization of SRH services etc were administered to adolescents and young adults who agreed to participate in the study. Research assistants had been trained and orientated to ensure collection of quality data. They explained the objectives of the study to clients during their ART pick up visits. In a private room, the research assistants administered the questionnaire to those who consented or gave ascent/parental consent. In addition to sociodemographic characteristics of study participants, they were asked questions on knowledge and utilization of the different categories of available SRH services, whether or not they desire to get married and/or have children in future. Their ART adherence/retention for the past twelve months and viral suppression status was extracted from the patient file.

Data management and analysis

The data was checked, coded, entered into Microsoft Excel, cleaned and exported to Stata version 14.0 where statistical analysis was performed. The dependent variables were "health outcomes (ART adherence and viral suppression) and RH decisions while the independent variable was SRH service utilization. Descriptive statistics (frequencies and proportions) were used to describe the characteristics of participants and the Chi square test was used to compare the difference in characteristics of participants for statistical significance. Odds ratios at 95% confidence interval were calculated using logistic regression analysis to determine the association between the dependent and independent variables and their precision. Univariate analysis was initially conducted and significant variables were entered into a multiple logistic regression model to investigate the characteristics to the outcomes.

Results

A total of 340 adolescents and young adults living with HIV in the Northwest region of Cameroon were included in the study with a mean age of 18.7 years. Of the participants enrolled, a total of 211 (62.1%) were in the age group 15-19 years, close to half (41%) were residing in urban settings, the majority (93%) were singles. Over half (53%) were schooling, about two-thirds (92%) had attended post-primary

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educational level and the participants were predominantly Christians (96%).

Tabel 1 below presents details of the characteristics of study participants

Table 1: Sociodemographic characteristics of study participants

Variable/Level	N=340	%
Age group (Years)		
15 – 19	211	62.10%
20 – 24	129	37.90%
Sex		
Female	238	70%
Male	102	30%
Marital status		
Single	316	93%
Married	24	7%
Setting of residence		
Rural	139	41%
Semi urban	63	19%
Urban	138	41%
Level of Education		
Primary	26	8%
Post primary	314	92%
Current educational status		
Schooling	180	53%
Not schooling	160	47%
Occupational status		
Formerly employed	16	4.70%
Self Employed	73	21.50%
Unemployed	251	73.80%
Religion		
Christians	327	96%
Muslim	13	4%

We evaluated the level of utilization of SRH services by the study participants at 58%. Only 30% of participants made good use the available SRH services. The utilization rates of the different groups of SRH services were 78%, 70% and 76% for counseling services, pregnancy prevention and STI prevention services respectively. This information is presented on figures 1 and 2 below.

We went further to see what influenced the utilization of these services. At bivariate analysis, factors statistically associated with uptake of SRH services were age group, sex, residential setting, current educational status and SRH knowledge. Significant factors from bivariable analysis were put into a multivariate logistic regression analysis to predict their association with uptake of SRH services among adolescents and young adults living with HIV. Sex, residential

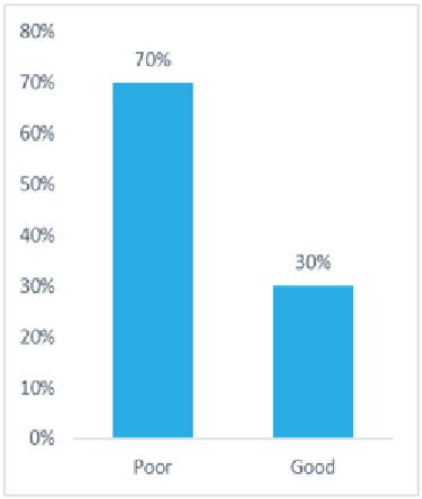

Figure 1: Overall SRH Service uptake rating.

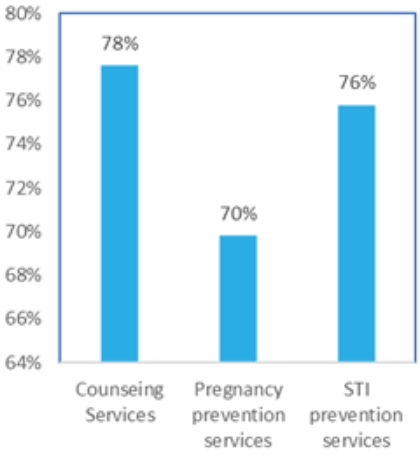

Figure 2: Uptake of different groups of SRH services

setting, current educational status and SRH knowledge were significant factors associated with use of SRH services (Table 2). Compared to females, males were less likely (AOR=0.47, 95%CI:0.25-0.9) to use SRH services (P-value = 0.01). Compared to participants in rural settings, those in urban settings were less likely (AOR=0.50, 95% CI;0.22-0.30) to use SRH services (P-value=0.03). Participants who were currently not schooling were less likely (AOR=0.55, 95% CI:0.32-0.94) to use SRH services compared to those who were schooling (P-value=0.03). The odds of SRH service uptake among participants with good SRH knowledge was more than 4 (AOR=4.56, 95%CI:0.05-8.4) times higher than those in participants with poor SRH knowledge (P-value <0.01) (Table 2).

When asked the specific reasons why some participants did not use any of the different groups of contraceptives, 16% said they would have loved to use condoms but did not use them because it reduces sexual pleasure. Some (10%) believe that contraceptives can render one sterile. For some

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Table 2: Bivariable and multivariable factors associated with uptake SRH services.

Variable/Level	Uptake rating		Crude OR		AOR	
	Poor	Good	95%CI	P-Value	95%CI	P-Value
Age group (Years)				**0.04**		
15 – 19	156	55	1		1	
20 – 24	129	47	1.63(1.03-2.61)		1.34(0.80-2.30)	0.3
Sex				**<0.01**		
Female	154	84	1		1	
Male	84	18	0.40(0.22-0.70)		0.47(0.25-0.9)	**0.01**
Marital status				0.9		
Single	316	221	1			
Married	24	17	0.96(0.40-2.40)			
Setting of residence				**<0.01**		
Rural	82	57	1		1	
Semi urban	49	14	0.41(0.21-0.81)		0.50(0.22-0.30)	**0.03**
Urban	107	31	0.42(0.25-0.70)		0.63(0.036-1.13)	0.12
Level of Education				0.93		
Primary	18	8	1			
Post primary	220	94	0.96(0.40-2.30)			
Current educational status				**0.01**		
Schooling	116	64	1		1	
Not schooling	122	38	0.60(0.35-0.91)		0.55(0.32-0.94)	**0.03**
Religion				0.9		
Christians	229	98	1			
Muslim	9	4	1.04(0.31-0.31)			
SRH Knowledge				**<0.01**		
Poor	122	17	1		1	
Good	166	85	5.30(2.30-9.40)		4.56(0.50-8.40)	**<0.01**

(9%), their religions forbid them from using it and 11% of respondents said their sexual partners refused them from using any. Interestingly more than half (54%) of clients said they did not use because they did not know contraceptive methods.

In our study, we focused on two treatment outcomes; ART adherence and viral load suppression. We found out that 78% of enrollees had good ART adherence and that viral load was suppressed in 87% of participants. We went further to check if there was any association between use of SRH services and these treatment outcomes. We found a strong association between the uptake of SRH services and adherence to ART. This is seen in the fact that the highest percentage (85%) of those who adhered well were equally those among whom uptake of SRH services was good (P-value = 0.032). We also noticed a significant association between uptake of SRH services and viral suppression as demonstrated by the fact that 96% of those with suppressed viral load were those with good uptake of SRH services.

On the other hand, two reproductive health choices (decisions) were studied among the 316 participants who were unmarried; the desires to get married and to have children. We noticed that the majority of them had the desire to get married (87%) and the desire to have children (90%). Going further, we realized there was some association between SRH service uptake and these two reproductive health choices (the desire to get married and to bear children), though these association were not statistically significant. Details of the association between SRH service utilization and adherence, viral suppression and RH choices is presented in table 3 below.

When participants were asked to give reasons for their RH choices, majority (55%) said they did not want to get married for fear of status disclosure, 27% were scared of transmitting HIV to their partners and the remaining 18% decided to keep the reasons to themselves. On the other hand, when enrollees were asked to say why they did not want to have children, 44% said their children could become infected, 27% said they are scared of dying early and leaving the children, 11% were not sure of finances to cater for these children and 18% concealed their reasons.

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Table 3: Association between SRH service utilization versus adherence, viral suppression and RH choices.

	Uptake of Sexual and reproductive health services				
Variable/Level	**Poor**		**Good**		**P -Value**
	N=238	**%**	**N=102**	**%**	
Adherence to ART					**0.032**
Poor	60	25	15	15	
Good	178	75	87	**85**	
Viral Suppression					**0.001**
Suppressed	197	83	98	**96**	
Unsuppressed	41	17	4	4	
Desire to get married (N=316)	**N=221**	**%**	**N=95**	**%**	0.4
Yes	190	86	85	**89**	
No	31	14	10	11	
Desire to have children					0.7
Yes	199	90	87	**91**	
No	22	10	8	9	

Discussion

The results of our study indicate that sexual and reproductive health service utilization among adolescents and young adults living with HIV in the Northwest Region of Cameroon is suboptimal. With a total utilization rate of only 58%, this highlights a significant gap in the accessibility and acceptance of these vital services. Higher utilization rates were found in the study carried out in Kumbo West district of the Northwest region of Cameroon (61.0%,)[14] and in Ethiopia [5] probably because these studies were carried out among the general youth population while ours was among youths living with HIV. The rate of SRH services uptake in our study was 78%, 70% and 76% for counseling, pregnancy prevention and STI prevention respectively. Other studies revealed rates of 9%[5] and 19.7% [7] for counseling, 33% [3] and 77.3% pregnancy prevention and 7.6% for STI services [5]. Barriers to utilizing sexual and reproductive health (SRH) services included being of male gender, living in urban areas, and having dropped out of school. In contrast, a strong understanding of SRH services emerged as a key facilitator for their use. Compared to females, males were less likely (AOR=0.47, 95% CI:0.25-0.9) to use SRH services (P-value = 0.01). The finding that males were less likely to utilize SRH services aligns with existing literature that notes gender disparities in health-seeking behaviors. Males often face cultural and societal pressures that discourage them from seeking health services, especially those related to sexual and reproductive health. The lower likelihood of service utilization among adolescents not in school is also concerning. Education is a critical factor in health-seeking behavior, as it often correlates with increased health literacy and awareness.

Compared to participants in rural settings, those in urban settings were less likely (AOR=0.50, 95% CI;0.22-0.30) to use SRH services (P-value=0.03). In terms of residential settings, the fact that urban participants were less likely to utilize SRH services compared to their rural counterparts is counterintuitive but may reflect the stigma associated with urban environments or the overwhelming number of available health services that may lead to confusion. Participants who were currently not schooling were less likely (AOR=0.55, 95% CI:0.32-0.94) to use SRH services compared to those who were schooling (P-value=0.03). In Edthiopia, it was similarly noticed that the odds of SRH services was higher among students[5]. The odds of SRH service uptake among participants with good SRH knowledge was more than 4 (AOR=4.56, 95% CI:0.05-8.4) times higher than those in participants with poor SRH knowledge (P-value <0.01). This highlights that good knowledge of sexual and reproductive health significantly enhances the likelihood of service uptake. This finding echoes previous research suggesting that comprehensive SRH education is essential for empowering young people to make informed choices about their health. Our study focused on two treatment outcomes; adherence to ART treatment and viral load suppression. We found out that 78% of enrollees had good adherence and the viral load results were suppressed in 87% of clients. We went further to check is there was any association between use of SRH services and these treatment outcomes. Even though the relationship was not statistically significant, majority (85% of those with good adherence and 96% of those with suppressed viral load) made good use of SRH services. This could simply be because the consciousness to use SRH services already indicates a desire for a healthy sexual life and this directly contributes to treatment adherence and consequently viral

suppression. This could also be explained using the Health Belief Model which defines some key factors that influence health behaviors to include perceived benefits and confidence in ability to succeed (self-efficacy). Most ALHIV, especially those who were infected perinatally perceive ART with a lot of benefits and are determined to succeed, so they decide to be very adherent to ART. This directly results in viral load suppression. Past studies explored did not look at how the use of SRH services is associated with treatment adherence and viral suppression. Overall, this study emphasizes the urgent need for tailored interventions that address the specific barriers faced by adolescents living with HIV in Cameroon. By improving the accessibility and relevance of SRH services, we can promote better ART adherence, achieve viral suppression, and support positive reproductive health outcomes among this vulnerable population.

Two reproductive health choices were studied among the 316 participants where were unmarried; the desires to get married and to have children. It was noticed that majority had the desire to get married (87%) and the desire to have children (90%). These results were consistent with those gotten in Zambia in 2017 and 2018 respectively [7] [8] [9]. A strong association was equally noticed between the use of SRH services and the desires to get married and to have children. This is seen in the fact that 81% of those who desired to get married and 91% of those who desired to have children were from the group of participants with good rate of utilization of SRH services. When participants were asked to give reasons for their RH choices, majority (55%) of participants did not want to get married for fear of status disclosure, 27% were scared of transmitting HIV to their partners and the remaining 18% decided to keep the reason to themselves. These results are concurrent with those in one of the Zambian studies in 2018 where it was noticed that major concerns about marriage were fear of disclosing HIV status to partners and risk of infecting partners and/or children[8]. Conversely, when enrollees were asked why they did not want to have children, 44% cited the fear of their children becoming infected. The Zambian study in 2018 and the Ugandan study in 2021 found that the majority of ALHIV expressed a desire to have children in the future but lacked knowledge about preventing mother-to-child transmission of HIV [9] [10] [6]. The lower proportion of those who did not desire to have children due to fear of transmitting HIV to their children may indicate that more ALHIV are becoming aware of mother-to-child transmission prevention, although further awareness is still needed. A proportion (27%) of our study participants indicated they did not desire to have children because they feared dying early and leaving the children. This likely reflects a loss of hope regarding life expectancy. Although a smaller proportion (11%) mentioned uncertainty about finances to care for children, preferring not to have them initially, this could be due to a lack of income-generating skills necessary for financial independence and child-rearing.

Our study also found an association between SRH service utilization and the desire to get married, as well as the desire to have children. This could be explained by the fact that the use of SRH services by individuals living with HIV improves their sexual health, playing a significant role in viral suppression and consequently increasing life expectancy. This creates hope for the future and positively influences decisions regarding marriage and parenthood. This association has not been previously explored in the literature.

Conclusion

This study highlights the crucial role of sexual and reproductive health (SRH) service utilization in enhancing health outcomes among adolescents living with HIV (ALHIV) in Northwest Cameroon. Our findings indicate that greater access to SRH services correlates positively with improved adherence to antiretroviral therapy (ART) and higher rates of viral suppression. Additionally, the desire for marriage and child bearing among ALHIV underscores the need for supportive reproductive health services tailored to their unique needs. However, barriers such as gender, residential setting, and educational status hinder access to these vital services. There is therefore need to provide targeted SRH services to the different categories of young people living with HIV to improve their access.

Recommendations

1. To enhance access to SRH services there should be implementation of community-based programs that increase awareness and accessibility of SRH services specifically designed for ALHIV, particularly targeting young males and those in urban areas.
2. Development of educational initiatives that improve knowledge of SRH and ART adherence among ALHIV, focusing on preventing mother-to-child transmission and addressing misconceptions about contraception.
3. Foster community engagement and support systems to reduce stigma and fear of disclosure, enabling ALHIV to seek necessary health services without fear of discrimination.
4. Promote the integration of SRH and HIV services to ensure comprehensive care, facilitating better health outcomes and informed reproductive choices for young people living with HIV.
5. Advocate for policies that support the sexual and reproductive health needs of ALHIV, ensuring that resources are allocated to develop and sustain SRH services within health systems.

By implementing these recommendations, we can better support the health and well-being of adolescents living with HIV, ultimately improving their quality of life and future prospects.

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Ethical Considerations

This study received ethical approval from the Cameroon Baptist Convention Institutional Review board (IRB study number: IRB2021-77) and an administrative clearance from the Regional Delegate of Public Health for Northwest Region. An administrative approval was obtained from the Regional Delegation of Public Health, Northwest Region and other relevant authorities. Prior to interview, a written informed consent was obtained from every participant who were 18 years and older and written assent with guardian consent was obtained for those younger than 18 years. To ensure confidentiality, the questionnaires were coded and did not carry any information that could easily identify the clients and also, the data was protected with a password. Participants were informed of their right to withdraw from the study at any time without any negative consequences.

Authors Contributions

MV, the principal investigator and corresponding author, designed the study, executed it and wrote the first draft of the manuscript. NG, discussed the design and reviewed the manuscript. EN, analyzed the data. EM and BE reviewed the manuscript. PMT discussed the design and reviewed the manuscript. All authors read and approved the final manuscript.

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