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Research Article

Feasibility and Acceptability of a Mobile Health Application Among Adolescents and Young Adults Living with HIV in Fako Division, South West, Cameroon: Guidance for Development

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Abstract

Mobile health applications have emerged as promising tools for improving healthcare delivery and patient outcomes, particularly in the context of HIV care. Adolescents and young adults living with HIV face unique challenges in accessing and adhering to treatment, making them a vulnerable population that could greatly benefit from mobile health interventions. In this study, we assessed the feasibility and acceptability of a mobile health application among adolescents and young adults living with HIV. This study was conducted from April to June 2023 in the four health districts within Fako Division. The study utilized a mixed-methods approach to gather comprehensive insights from HIV clients and their healthcare provider. Quantitative data were collected using a structured questionnaire, while qualitative data collection was conducted through focus group discussions (FGDs). Qualitative data was analyzed with Atlas.ti Version9 while the quantitative data was analyzed with SPSS Version 25. Among the 119 participants enrolled, 102 (85.7%) demonstrated the ability to read and write while 111 (93.3%) were able to use social media platform. The proportion of participates who didn't own a mobile phone was significantly higher (55.4 %) among participants aged ≤19 years, compared to those aged 20-24 years (7.41%) ($p = 0.001$). Majority (86.6%) expressed the desire to use a mobile health application to facilitate the care and treatment services they receive. Participants expressed desired that such aplication should be able to provide reminders and prevention tips, social corner, drug side effects and appointments. However, they had concerns about the confidentiality of their health information. This study reveals evidence of high proficiency in using mobile applications making it promising for mhealth application to be accepted. However, it also emphasizes the need to prioritize and implement a robust system to ensure privacy and confidentiality during the use of a mobile health application.

Keywords: Mobile Health; Acceptability; Feasibility; Young Adults; Adolescents; HIV; Cameroon

Background

Achieving viral suppression remains a crucial objective for people living with HIV (PLWH), and this can be accomplished through good adherence to Antiretroviral Therapy (ART). Adhering to ART offers various advantages, such as reducing the risk of transmission to others, lowering morbidity and mortality rates, as well as decreasing the frequency of emergency department visits and hospitalizations for PLWH [1]. Adolescents and young adults living with HIV, face unique challenges in accessing and adhering to treatment, making them a vulnerable population [2,3]. Over the past decade, there has been increasing evidence of the benefits of mobile health interventions in managing chronic diseases in adolescents and young adults [4]. Consequently, mobile health applications (apps) have emerged as promising tools for improving healthcare delivery and patient outcomes, particularly in the context of HIV care [5-7]. Despite these advancements, there is still insufficient information on the feasibility and acceptability of mobile health apps tailored to the needs of the populations in most low and middle-income countries, including Cameroon.

The latter, like many sub-Saharan African countries, has a significant burden of HIV infection, with a high prevalence among adolescents and young adults [8]. The South West Region of Cameroon harbors a good number of HIV cases among this age group, but the rate of retaining HIV diagnosed cases on treatment remains a problem in the region, being one of those with poor performance [9]. The prevalence of HIV in the region is estimated at 3.6% among individuals aged 15years and above (10). Data from the region shows that the positivity rate among the adolescent is (15-19 years) is 3.3% and 4.0% among young adults (20-24 years) [10]. With respect to achieving the UNAIDS 95-95-95 targets by 2030, it is estimated that 49,775 people are living with HIV in the region, approximately 91% of these individuals have been identified and only 67% of those identified have been initiated on treatment. On the other hand, viral suppression among people on ARTis estimated at 88.2% [11].

Enhancing HIV care and treatment services for adolescents and young adults is crucial to achieving the UNAIDS 95-95-95 targets and improving overall health outcomes. In line with Adolescent and Youth Friendly Services (AYFS), the development of a mobile health app that addresses the unique needs and challenges faced by adolescents and young adults living with HIV, could potentially improve their engagement in care, treatment adherence, and overall well-being. However, before such an app can be implemented, it is crucial to assess its feasibility and acceptability among the target population.

This study assessed the feasibility and acceptability of a mobile health application among adolescents and young adults living with HIV in the Fako Division of the South West Region, Cameroon. The study utilized a mixed-methods approach, combining quantitative and qualitative methods to gather comprehensive insights. It provides valuable insights for developing and implementing a mobile health app tailored to the needs of adolescents and young adults living with HIV.

Methodology

Study Setting

This study was conducted from April 6, 2023 to June 24, 2023 in the four health districts within Fako Division of the South West Region of Cameroon. It included treatment centres of health facilities providing HIV care and treatment services, namely Muyuka District Hospital, Buea Regional Hospital, Tiko District Hospital, and the Limbe Regional Hospital. These treatment centers were selected for their diverse urban and rural patient population, enabling a comprehensive assessment of the intervention's feasibility and acceptability across different settings.

Study Design

The study was a cross sectional with a mixed-methods to assess the feasibility and acceptability of introducing a mobile technology into HIV care and treatment among HIV clients, specifically targeting adolescent and young adults. Both qualitative and quantitative approaches were used to gather comprehensive insights from HIV clients and their healthcare provider.

Study Population

The study included adolescents and young adults enrolled on Antiretroviral (ARV) drugs in each of the selected HIV treatment centers and health care providers of each centers. A total of 11 Focus Group Discussions (FGDs) were conducted. Four FGDs were conducted among the health care providers (one in each health district), and seven FGDs were conducted among young adults and adolescents living with HIV (two in Muyuka, two in Buea, two in Tiko, and one in the Limbe). The quantitative arm included only adolescents and young adults on antiretroviral (ARV) drugs within the Fako Division.

Data Collection

A structured questionnaire was developed for the collection of quantitative data. The questionnaire was designed to gather information regarding phone ownership, literacy skills, internet access (through two-way WhatsApp messaging), and details about the different functionalities of the mobile app.

Qualitative data collection was conducted through Focus Group Discussions (FGDs). The FGDs aimed to gather reviews and

perceptions on the introduction of mobile health technology in the HIV program from both adolescents and young adults, as well as their caregivers. The FGDs were conducted in English, the common language understood by the participants.

The composition of FGDs for the adolescents and young adults was balanced in terms of gender, level of education, age, viral suppression, and adherence history. The composition of the focus group for caregivers was balanced in terms of hospital and community providers, counselors, psychosocial workers, consulting physicians, and pill distributors. This study adapted the FGD guide from Breen, 2006 [12].

Data Analysis

The qualitative data analysis was conducted using Atlas.ti Version 9. The transcripts from the focus group discussions were reviewed and coded to identify themes and patterns related to the feasibility and acceptability of introducing mobile health technology in the HIV program.

On the other hand, the quantitative data analysis was performed using SPSS Version 25, Descriptive statistics were calculated to summarize the demographic characteristics and responses. The associations and differences between variables of interest were conducted using the Chi-square test, with a significance level set at 0.05.

Results

Description of the study population

For the quantitative arm of the study, a total of 119 adolescents and young adults were enrolled, with 65 (54.6%) being adolescents of which, 67 (56.3%) were female, 55 (46.2%) were in secondary education. In addition, 101 (85.2%) participants were viral suppressed, while 84(70.6%) were adherent as measured by pill count (Table 1).

Factor	Variable	Frequency (%)
Gender	Female	67 (56.3)
	Male	52(43.7)
Age group	19years	65 (54.6)
	20 to 24years	54 (45.4)
Educational level	Higher education	45 (37.8)
	Primary	19 (16.0)
	Secondary	55(46.2)
	Suppression	101(85.2)
Viral Suppression	Not Suppression	18(14.8)
Adherence	poor adherence	35(29.4)
	good adherence	84(70.6)
Total		119(100)

Table 1: Characteristics of the quantitative study population.

For the qualitative study, we conducted 10 Focus Group Discussions (FGDs) with a total of 65 participants. Among the FGDs conducted, three FGDs were among adolescents, three among young adults, and four among health workers. In terms of gender distribution, there were 34 females and 31 males. The adolescents' ages ranged from 15 to 19 years with a mean age of 16.9 years. The young adults were aged 20 to 24 years, with a mean age of 22.3 years, while the health workers' ages ranged from 22 to 54 years, with an average age of 37.6 years. In addition, Table 2 contains more information on participant's characteristics.

Location	Gender	Occupation	Academic level	Marital status
Tiko Adolescent	Female	Student	Secondary	Single
	Male	Student	Secondary	Single
	Male	Student	Primary	Single
	Female	Student	Secondary	Single
	Female	Student	Secondary	Single
	Male	Student	Secondary	Single

Tiko Health workers	Female	Counselor	Tertiary	Married
	Male	Data clark	Tertiary	Married
	Male	Finance	Tertiary	Married
	Female	Nurse	Tertiary	Married
	Female	Nurse	Tertiary	Married
	Male	Social worker	Tertiary	Married
	Male	Major	Tertiary	Married
	Female	Social worker	Tertiary	Single
Limbe adolescent	Female	Student	Secondary	Single
	Male	Student	Secondary	Single
	Male	Student	Secondary	Single
	Female	Student	Secondary	Single
	Female	Student	Secondary	Single
	Male	Student	Secondary	Single
	Female	Hair dresser	Secondary	Single
	Male	Student	Secondary	Single
Limbe young adult	Female	Student	Secondary	Single
	Male	Business	Secondary	Single
	Male	Student	Tertiary	Single
	Female	Business	Secondary	Single
	Female	Student	Secondary	Single
	Male	Business	Tertiary	Single
	Male	Business	Tertiary	Single
	Female	Business	Secondary	Single
Limbe Health s Workers	Male	Major/nurse	Tertiary	Married
	Male	Ado champion	Secondary	Married
	Male	Ado champion	Secondary	Married
	Female	Social worker	Tertiary	Married
	Male	Social worker	Tertiary	Married
	Female	Adolescent focal point	Tertiary	Married
	Female	M.D	Tertiary	Married
	Female	Nurse		Single
Buea adolescent	Female	Student	Secondary	Single
	Male	Student	Secondary	Single
	Male	Student	Secondary	Single
	Male	Student	Secondary	Single
	Female	Student	Secondary	Single
	Female	Student	Secondary	Single

Buea young adults	Female	Student	Secondary	Single
	Male	Student	Secondary	Single
	Female	Business	Secondary	Single
	Male	Student	Secondary	Single
	Female	Student	Secondary	Single
Buea Health Workers	Male	Nurse	Tertiary	Married
	Male	Social worker	Tertiary	Married
	Female	Social worker	Tertiary	Married
	Female	Counselor	Tertiary	Married
Muyuka young adults	Female	M.D	Tertiary	Married
	Female	Student	Secondary	Single
	male	Trader	Primary	Single
	Female	Business	Secondary	Single
	Male	Farming	Primary	Single
	Female	Student	Secondary	Single
Muyuka Health Workers	male	Major	Tertiary	Married
	Female	Social worker	Tertiary	Married
	male	Social worker	Tertiary	Married
	Female	Counselor	Tertiary	Married
	male	M.D	Tertiary	Married
	Female	Nurse	Tertiary	Married

Table 2: Characteristics of the qualitative study population.

Feasibility of using Mobile Health application

Among the 119 participants included in the study, 79 (66.4%) reported owning mobile phones, while 102 (85.7%) demonstrated the ability to read and write in a two-way text message evaluation. The majority of the participants, 76 (63.9%), had regular access to internet, and 111 (93.3%) were able to use social media, as evidenced by their response to WhatsApp messages. Among the participants 112(94.1%) were of the opinion that a mobile Health application can be used in the HIV program (Table 3).

Factor	Variable	Frequency (%)
Mobile phone ownership	Yes	79 (66.4)
	No	40 (33.6)
Ability to read and write	Yes	102(85.7)
	No	17(14.3)
Ability to purchase internet bundle	Yes	65(54.6)
	No	54(45.4)
Having access to the internet	Yes	76 (63.9)
	No	43 (36.1)
Ability to use social media	Yes	111(93.3)
	No	8(6.7)
Feasible to use using mHealth in HIV program	Yes	112(94.1)
	No	07(5.9)

Table 3: Feasibility of using Mobile Health application.

Among the 40 participants who did not own a mobile phone, a significant majority, 36 (90%), were aged ≤19 years, compared with those aged 20-24 years (p = 0.0001).

Furthermore, it was noted that phone ownership was higher among participants who had attended higher education (45.6%) compared to those with a primary education level (12.7%) (p = 0.042). Regarding the ability to purchase internet bundle, participants aged 20-24 years had more internet bundle purchasing power (66.2%) compared to those aged ≤19 years (33.8%) (p=0.001) (Table 4). The results also revealed that out of the 17 participants who were unable to use social media, the majority were adolescents, 13 (76.5%) compared with the young adult (p=0.013).

Factor	Variable	Frequency	Do you own a mobile phone		p value	Have credit to reply to text messages		p value	Read and write message using WhatsApp		p value
			No (%)	Yes (%)		No (%)	Yes (%)		No (%)	Yes (%)	
Gender	Female	67	23 (57.5)	44 (55.7%)	0.851	27(40.3)	40 (59.7)	0.206	12 (70.6)	55 (53.9)	**0.031**
	Male	52	17 (42.5%)	35 (44.3)		27 (51.9)	25 (48.1)		5(29.4)	47(46.1)	
Age group	≤19years	65	36 (90)	29 (36.7)	**0.0001**	43 (79.6)	22 (33.8)	**0.0001**	13 (76.5)	52 (51)	**0.013**
	20 to 24years	54	4 (10)	50 (63.3)		11 (20.4)	43 (66.2)		4 (23.5)	50 (49)	
Educational level	Higher education	45	9(22.5)	36(45.6)	**0.042**	19 (35.2)	26 (40.0)	0.865	4 (23.5)	41 (40.2)	0.252
	Primary	19	9(22.5)	10(12.7)		9 (16.7)	10 (15.4)		2 (11.8%)	17 (16.7)	
	Secondary	55	22(55.0)	33(41.7)		26 (48.1)	29 (44.6)		11 (64.7)	44 (43.1)	
Viral Suppression	Suppression	101	35 (87.5)	66 (83.5)	0.569	49 (90.7)	52 (80.0)	0.104	13 (76.5)	88 (86.3)	0.296
	Not Suppression	18	5 (12.5)	13 (16.5)		5 (9.3)	13 (20.0)		4 (23.5)	14 (13.7)	
Adherence	poor adherence	35	12 (30.0)	23 (29.1)	0.92	18 (33.3)	17 (26.2)	0.392	6 (35.3)	29 (28.4)	0.565
	good adherence	84	28 (70.0)	56 (70.9)		36 (66.7)	48 (73.8)		11 (64.7)	73 (71.6)	

Table 4: Factors affecting the usage of Mobile Health Application in HIV Program.

Acceptability of using Mobile Health application

Among the 119 participants sampled, 103 (86.6%) expressed a desire to use a mobile health application to facilitate their care and treatment services. The participants' gender, age group, educational level, viral suppression, and adherence were not associated with the acceptance to use a mobile health application (Table 5).

Factor	Variable	Frequency	like to use a mobile health application		p value
			No (%)	Yes (%)	
Gender	Female	67	10(14.9)	57(85.1)	0.591
	Male	52	6(11.5)	46(88.5)	
Age group	19years	65	10(15.4)	55(84.6)	0.496
	20 to 24years	54	6(11.1)	48(88.9)	
Educational level	Higher education	45	4 (8.9)	41 (91.1)	0.523
	Primary	19	3 (15.8)	16 (84.2)	
	Secondary	55	9 (16.4)	46 (83.6)	
Viral Suppression	Suppression	101	13 (12.9)	88 (87.1)	0.664
	Not Suppression	18	3 (16.7)	15 (83.3)	
Adherence	Poor adherence	35	3 (8.6)	32 (91.4)	0.314
	Good adherence	84	13 (15.5)	71 (84.5)	
Total		119	16(13.4)	103(86.6)	

Table 5: Factors associated with Mobile health Acceptance in the HIV program.

Regarding the desired functions of the mobile health application, all participants expressed a preference for receiving reminders and prevention tips. In addition, other functions that were highly required by the participants included sharing treatment concerns, information about drug side effects, scheduling appointments, sharing treatment experiences, and receiving daily pill reminders (Figure 1).

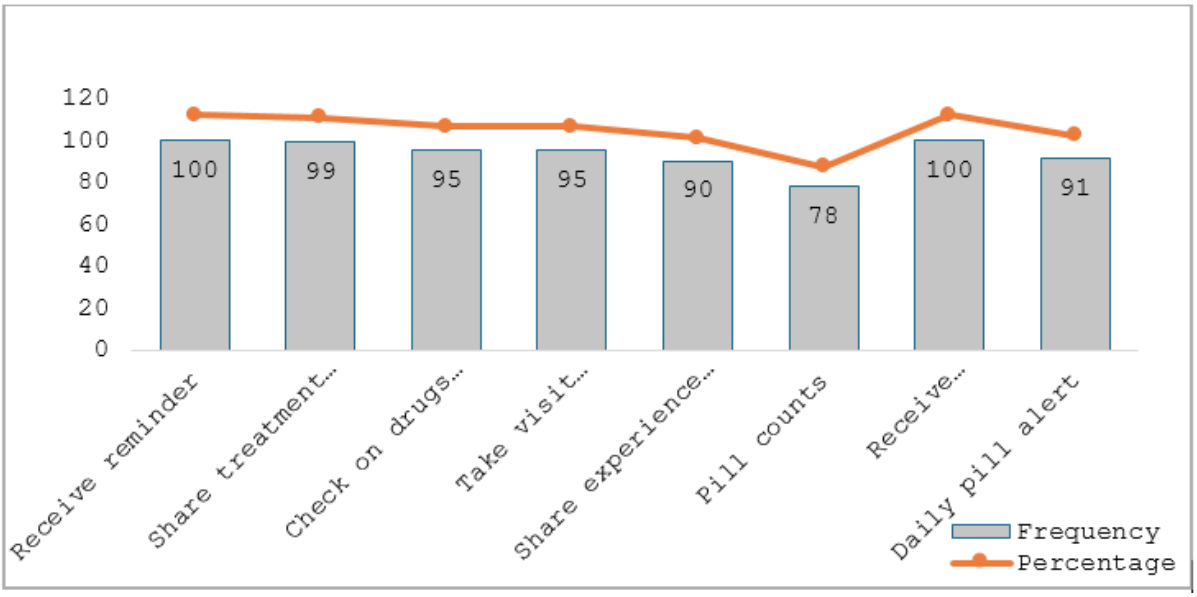

Figure 1: Function of a mobile health application participate will like to have.

Qualitative results

Focus group discussions were also conducted to capture the perceptions of health workers, HIV adolescents, and young adults regarding the introduction of a mobile application in the HIV care and treatment program. The participants expressed diverse opinions about the feasibility and acceptance of a mobile application in the HIV program.

Participants' perception on the feasibility of introducing a mobile health application into the HIV care and treatment program

Health system-related factors

The participants expressed belief that the health system has the necessary resources to support the use of the app. A health staff stated during a focus group discussion: *"For now, all the workers here are using personal phones and the health system provides credit. The health system has not provided us with phones, but it's possible they can provide phones just for the process"* (FGD, Health worker Buea).

Adolescents and young adults also believe the health system has the capacity to fund the use of the mobile application in the HIV program to improve adherence. One participant stated: *"If it is possible for them to give us free drugs, then it is possible they can provide accessories and cover the costs to run the app"* (FGD, young adults Muyuka, M20). An adolescent supported this narrative by saying: *"I think they can provide phones, and even data is not more than the program to provide to the staff"* (FGD, adolescents Limbe).

Regarding whether the target population can accommodate the innovation, a health staff pointed out: *"If you look at the number of hours youths spend on Facebook, TikTok, WhatsApp, etc., it is really high, and this doesn't help them in their health. So, they can put those resources and time into an app that will help them promote their health?"* (FGD, Health Staff Muyuka).

Acceptability of the mobile application in HIV care and treatment

Information about the acceptability of Mobile health was also gathered through focus group discussions, conducted among adolescents, young adults, and healthcare providers. The participants expressed varied opinions regarding the acceptance of the mobile application and whether they believed it would be embraced or not. Codes that emerged from the sessions indicated that a significant portion of the population would accept and use the application.

To support the notion of acceptance, some healthcare workers shared their perspectives. One health worker stated, *"Adolescents will buy the idea because they first of all have android phones"* (FGD, Health Staff Limbe). Another health staff member added, *"It will even help to reduce stigma. The app will be greatly welcomed even by the clients because some of them try much to avoid stigmatization. You can interact with them more through the app, and they don't need to always come here. They don't need to come and meet someone they may know in the quarter"* (FGD, Health Staff Buea).

Another participant mentioned having observed a similar mobile application working in the HIV program in another country and strongly believed that the application would be well-received in Cameroon. She said, *"I think it will be a good thing. I have seen it in South Africa, and such an app really helps increase adherence. There, people even have cards that they slot at certain points, and they collect their drugs without necessarily going to the hospital. It is rare to see people going to the hospital except the condition is worst"* (FGD, Tiko Health Staff).

Adolescents and young adults also expressed their belief that a mobile application idea would be welcomed and accepted. During the focus group discussions, an adolescent stated, *"To me, I know the population will accept it"* (FGD, Adolescents, Tiko). Furthermore, a young adult added, *"The population will accept it. The app will be good because it is for some specific people and not the general public to an extent..."* (FGD, Young Adults Buea).

Features of the Application from participants prospective

During the focus group sessions conducted at two level (health workers and clients), they shared their interest on important features they expect to see in such a mobile application. Participants expect the application to have the following features: reminder messages, appointment booking, a social corner, and the ability to share tips about HIV.

Majority of participants expressed a strong desire to receive reminder messages. An adolescent girl said, *"Sometimes one sleeps and forgets the time to take treatment. With the app, we propose a loud reminder. For me, the reminder should be a sound"* (FGD, Adolescent Tiko). Forgetfulness appears to be a significant challenge with adherence to treatment. A young adult in the focus group explained her need for reminders by saying, *"The app should be able to remind us. Sometimes one gets busy and forgets to take the medication"* (FGD, Young Adult Buea). A health worker also voiced her support for the reminder feature. She said, *"Reminders would be helpful, especially for patients with high viral load. I think it will be of great advantage. If it is coming from the app, it has to be in coded language understandable to the patients"* (FGD, Limbe).

Furthermore, participants also requested a feature that would allow them to book appointment visits. One health staff member explained, *"Concerning appointments, it will ease communication between us and the clients. Some clients may not pick up calls or inform us that they will not be able to come. So, if the app has that feature, it will be good"* (FGD, Health Staff Limbe).

Another participant made a suggestion regarding appointment booking, expressing a desire for appointments to be available for longer than 3days. She said, *"The appointment feature is good, but*

let it be booked for around two weeks" (FGD, Young Adult Buea). The participants also a social corner will be a good to be included in the application. *"It will be good to have a social corner in the app and let doctors be there too. The social corner can even help people find partners. At least the only worry will be following up on viral load suppression, not worrying about status anymore"* (FGD, Young Adult Buea).

More participants welcomed the idea of a social corner within the app. A female staff member in Limbe stated, *"It will still be good to have a social corner. Clients will be able to interact with one another, but anonymously"* (FGD, Health Staff Limbe).

Participants believed that the application would not only help overcome stigmatization but also serve as a platform for encouragement for those who feel discouraged. A male young adult said, *"A social community can be very helpful. People often stop treatment due to drug side effects. Some people can share their experiences and receive help and counseling through the social corner. They can explain their experiences and encourage others to stick to treatment. But everyone should be treated as anonymous in the app"* (FGD, Young Adult Muyuka).

In addition to the desired features, health workers also emphasized the need for the app to provide health tips. One health worker expressed, *"I think it will be a good app, if health tips will be provided to prevent treatment defaults, transitioning from first to second line, receiving reminders, etc. This will greatly enhance adherence"* (FGD, Health worker Muyuka).

Some concerns participants had about such an Application

While the participants believe that the application will be helpful, many of them expressed concerns regarding the confidentiality of their information. Some concerns about confidentiality were raised by health providers and clients. One young adult stated, *"To my view, you know many people will always like be confidential with their status. I think educating the population about the confidentiality of the app will encourage people to use the app"* (FGD, Young Adults Buea). Another health worker asked, *"My question is, how confidential is the app? Are you sure hackers would not hack the app like they do on Facebook and similar platforms?"* (FGD, Health Staff / Data Clerk Tiko).

Another health workers, who also worked as a psychosocial worker, expressed concerns about confidentiality in relation to their coded discussions with clients. They said, *"There are some clients who are not part of the support group here. I'm talking about adults or adolescents. We discuss drugs discreetly. We have coded discussions. If the conversations and notifications in the app can be coded as well, then it will be good. If not, confidentiality will be a problem"* (FGD, Buea Health worker / Psychosocial Worker).

One health worker raised concerns about the lack of privacy in general, stating, *"Today, you cannot claim that your phone is yours alone because someone can take your phone to verify something and end up checking other things. There is no confidentiality because you will start answering questions like 'why and why?"* (FGD, Health worker Limbe).

A young adult shared worry about someone they know finding them with the app and potentially revealing their status to their family. He said, *"For me, I am a student and my father doesn't know about my status. If someone outside of this age group who I know finds me with the app, they may tell my family, which is something I don't want to happen. If that person cannot keep secrets, they will expose everything. You will suffer because the society doesn't take it lightly on people with HIV. Everyone will ignore you and you will be left alone"* (FGD, Young Adults Muyuka).

Another young adult emphasized the importance of privacy in social corner and the need to ensure that third parties cannot use the application or access shared data. They said, *"The privacy should also involve social corner. Third parties should not be able to use the application, and sharing of data should be completely wiped out"* (FGD, Buea Young Adult).

One participant suggested abbreviating the app name to avoid raising suspicion. They said, *"Just imagine a friend picks up your phone and sees the app, it is kind of alarming. Maybe they can abbreviate or code everything"* (FGD, Young Adults Limbe).

In addition, another health worker raised the issue on financial constraints, stating, *"Let me speak for the children here. Most of them cannot even afford transportation or three-square meals to take their medication, let alone a phone and internet costs. Many of them are orphans because their parents have died"* (FGD, Limbe worker Staff / Child Focal Point).

Discussion

In this study, we examined the feasibility and acceptability of mHealth in the HIV program, with a focus on adolescents, young adults, and their healthcare providers. We also aimed to provide information for evidence-based mHealth application development. A significant percentage of participants (66.4%) reported owning mobile phones, while 85.7% of the participants demonstrated proficiency in reading and writing in two-way text messages. This goes a long way to highlight the potential for mobile-based interventions within target population. A significant number of participants (93.3%) were proficient in using social media platforms, as observed through their responsiveness to WhatsApp messages. These findings are similar with reports from previous studies in developed countries, which show high rates of technology and mobile device use [13]. The participants also noted that the health

system currently provides credit for program staff and has the capacity to fund the use of a mobile application to enhance program outcomes. These insights highlight the potential for integrating mobile technology into the health system in a sustainable manner. The use of mobile health applications in HIV has been studied in many other countries, both in young and adult populations with some benefits reported [6,14-18].

Significant proportion of participants (86.6%) expressed a strong interest in utilizing a mobile health application to enhance their care and treatment services. Health workers also noted that young people are likely to embrace the idea due to their familiarity with social media tools. This underscores the potential benefits and positive reception of incorporating a mobile application into the HIV program. In other studies, HIV clients used their phones at one point to facilitate their care and treatment [13,19]. Health workers also believe the innovation will be accepted, as it would help reduce stigma and allow for increased interaction with clients without the need for face-to-face meetings. Studies have shown that mHealth can address some barriers that impeded health care delivery in the young population [20-23].

Regarding the features of interest for a possible mobile health application, participants expressed the desire for an application that can provide reminders, prevention tips, drug side effects information, appointments, and a social corner. This finding is in agreement with previous studies that have shown how these functions can empower individuals to take an active role in managing their health, improve medication adherence, enhance preventive measures, and foster social support within a digital health community [7,13,24-27].

Participants also believe that the mobile health application will be helpful, however many of them expressed concerns regarding the confidentiality. Confidentiality concerns among adolescents and young adults living with HIV can be attributed to the fears of stigmatization and perceived discrimination. This is evident in the opinions of some participants who believe that if someone outside their treatment group learns of their HIV status, they will face significant negative consequences due to societal attitudes towards people living with HIV. Healthcare workers also share similar concerns about confidentiality, as they worry that mHealth application could be susceptible to hacking, citing their daily experiences with security breaches on social media platforms. These participant opinions align with cyber insecurity statistics, such as the reported hijacking of 25% of Facebook accounts and approximately 85% of Instagram accounts being hacked in 2023. The rapid shift to digital platforms during the COVID-19 pandemic also resulted in increased in hacking incidents [28].

The fear of confidentiality breaches among adolescents and young adults living with HIV is heightened by the fact that their healthcare providers hold discussions about their medications discreetly and use coded language. This is due to the concern that unauthorized disclosure of their HIV status could result in a breach of trust and potential harm to their reputation or relationships [29]. Other studies on the acceptability of mobile health application in the HIV program have also reported concerns from participants regarding the confidentiality of their information [5,13,16,29,30].

Conclusion

The findings of this study provide valuable insights into the potential of mHealth applications in the HIV program for adolescents and young adults. The study reveals evidence of high mobile phone ownership and proficiency in using mobile applications among the target population. However, it also emphasizes the need to prioritize and implement a robust system to ensure privacy and confidentiality during the development of a mobile health application. This is essential to guarantee the protection of sensitive health information and build trust among users.

Declarations

Ethics approval and consent to participate

The study was implemented in compliance with the Declaration of Helsinki on human subjects. Ethical clearance was obtained from the University of Buea Faculty of Health Sciences Institutional Review Board, with reference number 2023/187-01/UB/SG/IRB/FHS.

Written informed consent was obtained from adult participants, and written assent was obtained from the guardians/parents of minors, ensuring their understanding and voluntary participation in the study.

Administrative authorization was obtained from the South West Regional Delegation of Public Health and the District Health Services of the respective districts involved in the study. Hospital Directors provided authorization to access the treatment centers in their various facilities.

Consent for publication: Not applicable

Availability of Data and Materials

The authors confirm that the data supporting the findings of the study are available within the article. However, the datasets used for the analysis are available from the corresponding author upon request.

Competing Interests

The authors declare that they have no financial or personal relationships that might have inappropriately influenced them in writing this article.

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Authors' Contributions

CN conceived, designed and led the study implementation and data analysis, TN participated in the conception, designing and supervised the study implementation, PTNM participated in the designing and in developing the manuscript, EAT participated in the designing and field implementation, ETA participated in the field implementation, LKA participated in the field implementation and data analysis, TOE participated in the designing and supervised the study implementation PAN conceived, designed and supervised the study implementation. All authors read and approved the final manuscript.

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Disclaimer

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