



Original article

Acceptability of a Pilot Intervention of Voluntary Medical Male Circumcision and HIV Education for Street-Connected Youth in Western Kenya

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A B S T R A C T

Purpose: Street-connected youth (SCY) in Kenya and elsewhere in sub-Saharan Africa are at high risk of HIV. Voluntary Male Medical Circumcision (VMMC) reduces the risk of female-to-male HIV transmission. Circumcision is also a traditional coming-of-age process in many Kenyan ethnic groups. This paper describes the acceptability of VMMC delivered as part of a ten-day healing, educational, and 'coming-of-age' retreat implemented as a pilot with SCY.

Methods: Male SCY aged between 12 and 24 living on the street for more than 3 months were eligible to participate. The study took place over 10 days. After medical circumcision, youth participated in education modules. Data collected included qualitative semi-structured exit interviews featuring structured and open-ended questions about factors relevant to this intervention's acceptability.

Results: There were 116 SCY (median age 14, IQR 13–15) who participated in the study. All were circumcised successfully, with no major complications. The majority of participants (81%) agreed that the circumcision procedure was uncomplicated, and 99% agreed the education was an important part of the initiation process. Thematic analysis of interview data highlighted four factors important to the program's acceptability: providing food, shelter, security; providing a safe place to heal; including traditional elements; and being with peers.

Conclusions: This novel implementation of VMMC was found to be acceptable to SCY participants and could likely be adapted and scaled for HIV prevention and education with SCY elsewhere in Kenya and sub-Saharan Africa where circumcision is part of traditional coming-of-age processes.

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IMPLICATIONS AND CONTRIBUTION

Little evidence guides the adaptation and delivery of proven HIV prevention interventions for street-connected youth in low-income countries. This study describes a pilot of a voluntary male medical circumcision intervention delivered as part of a traditional coming-of-age education program targeting male street-connected youth in sub-Saharan Africa, highlighting key acceptability concerns.

Abbreviations: ACIP, African Christian Initiation Program; CCI, Charitable Children's Institution; CO, Clinical Officer; HIV, Human Immunodeficiency Virus; LMIC, Low- and Middle-Income Countries; PITC, Provider-Initiated Counselling and Testing; RS-14 TM, 14-item Resilience Scale TM; RSES, Rosenberg Self-Esteem Scale; SCY, Street-Connected Youth; SSA, Sub-Saharan Africa; UG, Uasin Gishu County; UNAIDS, Joint United Nations Program on HIV/AIDS; VMMC, Voluntary Male Medical Circumcision

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Disclaimer: We would like to notify the editors that we have a related manuscript entitled 'Outcomes of a pilot intervention of Voluntary Medical Male Circumcision and HIV education for adolescent street youth in western Kenya' that is currently under consideration elsewhere.

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Street-connected youth (SCY) are children or youth working and/or living on the streets, for whom the street is a “central reference point... which plays a significant role in their everyday life and identity” [1]. These young people are typically driven to the streets by extreme poverty, family conflict, and/or child abuse/neglect. They are often highly marginalized [2,3].

SCY are also at increased risk of human immunodeficiency virus (HIV). Although data are scarce, especially in low- and middle-income countries (LMICs), research suggests that HIV prevalence among SCY is higher than in the corresponding general population, often by a factor of 2 or more [4]. In Kenya, studies have found 4%–8.7% HIV prevalence among SCY [5, 6], double to triple the national youth HIV prevalence estimated at 2.26% in males and 3.97% in females [7]. Several factors may be contributing high HIV prevalence among SCY, including low HIV knowledge, gender-based violence, substance use, street initiation practices, high-risk sex, and survival sex [8–10].

Despite the high risk of HIV, there are few peer-reviewed data to guide service providers in adapting or delivering HIV prevention, testing, and treatment interventions for SCY in LMICs, particularly sub-Saharan Africa (SSA), where HIV is endemic in many settings. SCY are mostly neglected in research on adolescent HIV prevention and treatment, and the few existing studies have been concentrated in high-income countries [11, 12]. There is a critical need for research that identifies, describes, and evaluates novel implementation strategies for delivering evidence-based HIV interventions to SCY in LMICs, particularly SSA [11,13,14].

Voluntary Male Medical Circumcision (VMMC) reduces the risk of female-to-male HIV transmission [15–17], and has been identified by the Joint United Nations Program on HIV/AIDS as a key intervention for high-risk adolescent populations in HIV endemic countries [18]. In response to these recommendations, Kenya and other countries in SSA scaled up VMMC services for men aged 15–19 [19]. However, uptake of VMMC among vulnerable and hard-to-reach adolescent populations has been slow [18].

Contextual factors suggest that VMMC would be acceptable to SCY in Kenya. In parts of the country male circumcision uptake is already over 80%, and in many ethnic groups, the circumcision procedure is part of traditional coming-of-age or initiation practices [19]. However, SCY are typically not included in traditional coming-of-age processes in the community, and may not be able to afford circumcision in a hospital. They may lack a safe location in which to recover. As a result, this high-risk group has little access to VMMC.

We adapted and piloted a program to implement VMMC as part of a ten-day healing, educational, and coming-of-age retreat for male SCY in western Kenya. Because coming-of-age processes traditionally include teachings, framing this pilot as a coming-of-age retreat presented a ‘teachable moment’—an opportunity to bolster a biomedical HIV prevention intervention with education. Educational modules covered topics such as sexual health, HIV, conflict management, and positive self-image. The objective of the present analysis is to describe the implementation process and acceptability of the pilot.

Methods

Study setting

This research took place in Eldoret, the administrative and commercial center of Uasin Gishu (UG) county Kenya, population

289,380 [20]. Approximately 51.3% of UG’s population live below the Kenyan poverty line, and more than half are younger than 20 [21]. Eldoret is home to Moi University, the Moi Teaching and Referral Hospital, and the Academic Model Providing Access to Healthcare, one of SSA’s largest HIV care and treatment programs [22].

The engaging street youth in HIV interventions study

The parent study of this analysis, Engaging Street Youth in HIV Interventions, sought to identify, adapt and pilot interventions to engage Kenyan SCY in HIV prevention, testing, and treatment. We conducted a scoping review of evidence-based HIV interventions for high-risk youth using Arksey and O’Malley’s five-stage framework [23]. We presented the results to the research team and key knowledge users. Each of the possible intervention was assessed according to its position in the HIV prevention-care continuum; type (behavioral, biomedical, social, structural, or combination); feasibility; and applicability to the target setting. Several consensus-building sessions with the research team and knowledge users resulted in six interventions identified as suitable for adapting and piloting with Kenyan SCY. One was VMMC, a highly effective HIV intervention [24–27]. SCY are by definition unstably housed, so for this population to be safely circumcised, and to capitalize on this opportunity to provide education, we piloted the provision of VMMC as part of a ten-day healing, educational, coming-of-age initiation retreat.

Study design and human subjects’ protections. This study uses implementation science methods [28]. Implementation science has been defined as “the scientific study of methods to promote the systematic uptake of clinical research findings and other evidence-based practices into routine practice” [29]. This manuscript describes the acceptability of a pilot program to adapt and deliver an evidence-based clinical intervention, VMMC, and educational modules, to SCY in Kenya. The intervention was conducted between December 2016 and July 2017. We received institutional ethics approval from the Moi University/Moi Teaching and Referral Hospital Institutional Research Ethics Committee and the University of Toronto Research Ethics Board. We obtained written consent from all participants aged 18 years and over. For participants aged less than 18, written consent was obtained from the UG County Children’s Officer as *de facto* guardian, and written assent was obtained from participants. All prospective participants were told that they would be participating in research, what the study would entail, and that they had the right to withdraw from the study at any time.

Population. Male SCY aged 12–24 years who had lived on the street for more than three months and spent the majority of their days and nights on the street or with other SCY in a shared shelter were approached. Those who had not yet been circumcised were invited to participate in the program.

Sampling and recruitment. Snowball sampling was used to recruit study participants directly from primary locations on the street, known locally as ‘barracks’ or ‘bases.’ The target sample was 120 participants. Community leaders and peer navigators conducted extensive outreach and sensitization, and SCY and barracks leaders were invited to participate in a series of community meetings,

'mabaraza,' led by the research team [30], in order to promote community engagement and gather community input on ethical considerations [31]. During these *mabaraza*, study procedures and potential risks were explained, and youth were told that circumcision reduces the risk of HIV infection.

Study procedures. Eligible SCY were divided into three groups for VMMC, depending on the time of enrolment. Group 1 took place in December 2016, and Groups 2 and 3 in May 2017. The program took place on the grounds of a community organization for SCY in Eldoret. Three meals per day were provided for the full ten days.

On day 1, social workers obtained consent or assent for the program [31] and completed baseline surveys. The nurse and clinical officer screened participants for contraindications to circumcision. Ministry of Health certified Provider-Initiated Testing and Counseling service providers counselled and tested the youth for HIV. As is traditional in coming-of-age processes, the participants had their heads shaved, nails cut, and heard speeches from respected elders. On day 2, the circumcision procedure was performed onsite by a nurse and clinical officer using either the sleeve resection or forceps-guided technique, in accordance with the latest Kenyan National VMMC Strategy [19]. Lidocaine was used as anaesthesia, and amoxicillin and ibuprofen were provided for infection prevention and pain relief. Wound healing was monitored daily. Days 3–5 were for recovery. Educators used this time to develop a rapport with the group, and the youth chose a group name.

On days 6–9, youth participated in educational modules, described below. These modules were taught by social workers and community leaders.

On day 10, participants completed the program evaluation "acceptability questionnaire," described below. A graduation party was attended by community leaders, SCY, and some participants' family members. The event included speeches, performances, gifts, and a communal meal. Youth who wanted to leave the streets were connected with social workers, who facilitated their return to their family home or a Charitable Children's Institute (i.e., orphanage) as appropriate.

Instruments. Education manual. Modules were based on a resource titled 'My Life – Starting Now,' part of the African Christian Initiation Program, which teaches knowledge and life skills to adolescents [32]. Members of African Christian Initiation Program collaborated with members of the research team, community leaders, and former street youth to adapt this manual for SCY. Modules included health and hygiene, respect, self-esteem, peer pressure, good manners, basic good habits, making good decisions, 'you are special and I am special,' how to say no, conflict management and living peacefully in the community, 'my life starting now,' drug abuse, sexual and reproductive health, gender-based violence, and HIV/AIDS prevention and protection. HIV/AIDS prevention education covered condom use, having one or few partners, abstinence, and frequent testing. The adapted manual is appended.

Acceptability Questionnaire. On the last day of the program, each participant answered a questionnaire on the acceptability of this pilot intervention. The questionnaire consisted of 10 structured and 5 open-ended questions administered through face-to-face interviews. It took approximately 20 minutes to complete.

Data collection and analysis. Quantitative. Quantitative analysis was based on answers to structured questions in the questionnaire. Quantitative data were entered into Microsoft Excel

(15.23.2) from paper-based surveys, and subsequently imported into STATA (version 12.1) for analysis. Frequencies and percentages were calculated for selected variables.

Qualitative. Qualitative analysis was based on responses to open-ended questions in the questionnaire. All participants responded to open-ended questions. The questionnaire was written in English, and trained (Kenyan) study staff fluent in English, Swahili, and *Sheng* administered the questions in Swahili and/or *Sheng*. Responses were recorded in English. We conducted a realist thematic analysis, coding data according to themes that described the acceptability of the intervention with a focus on analysing experiences and opinions as presented, and remaining close to the data in determining themes [33]. Coding was conducted by MK and PS. Acceptability was conceptualized as an implementation outcome, and defined as the perception among stakeholders that a certain element of the pilot program was valued, agreeable, or satisfactory [34]. All names are pseudonyms.

Results

Sociodemographic and other characteristics

A total of 116 male SCY participated in the intervention in three groups of approximately 40 each. The sociodemographic characteristics of the participants are presented in Table 1. Thirty participants (25.9%) said they had previously had sex, and the median age of sexual debut was 12 (10–13). All participants consented to HIV testing, and one participant was HIV-positive. He was subsequently referred to the hospital for HIV care and ART initiation.

Circumcision

All 116 participants were circumcised successfully. There were no instances of major adverse events. Side effects including bleeding and/or swelling were recorded in 6 participants and managed onsite. Bleeding was addressed by applying pressure at the site, and swelling was addressed by the administration of ibuprofen. All participants fully recovered after ten days.

Table 1
Sociodemographic characteristics of participants

Variable	N = 116 Median (IQR)
Age	14 (13–15)
12–14	78 (67.2)
15–17	35 (30.2)
18–21	3 (2.6)
Ever attended school	105 (90.5)
Highest education level	
Nursery	4 (3.5)
Primary/Standard	100 (86.2)
Secondary/Form	1 (0.9)
Years involved with the street	
6 months to 1 year	31 (26.7)
1 to 2 years	22 (19.0)
2 to 5 years	43 (37.1)
>5 years	19 (16.4)
Unknown	1 (0.9)
Time spent on the street	
Days and nights on the street	85 (73.3)
Days on the street	30 (25.9)
Varies	1 (0.9)
Member of a base	113 (97.4)

Table 2
Structured acceptability questions

Question	Agree	Disagree
I enjoyed going away with my peers to have the initiation and education	115	1
The medical circumcision procedure was uncomplicated	94	22
I had enough time for recovery after the procedure	104	12
I thought the education was an important part of the initiation process	115	1
I learnt a lot from the education	116	0
It was important to me to go through the VMMC program with my age mates	116	
What did you think about having the education program over 4 days?		
It could have been done in fewer	1	
It was enough	79	
More days were needed	36	

Acceptability

Participants' answers to the structured acceptability questions are presented in Table 2. Overall, the vast majority of participants were satisfied with the circumcision and the educational modules.

We identified two major domains in participants' responses to open-ended questions about the acceptability of this program: themes related to the benefits of participating, and themes related to facilitators of participating in the program.

Benefits of Participating in the Program.

1) Having basic needs met.

In discussions about what participants liked about the program, one of the most prominent themes was that it provided for basic needs like food, shelter, and security. Food, in particular, played a large role, for example, *"I loved everything especially food"* (Dennis, age 17). Shelter and security were the next most common domains. Responses to questions about what participants liked included *"staying at the centre for 10 days"* (John, age 13). Security, while related to shelter, was distinctly related to respite from violence on the street, for example, *"it was smooth and peaceful for here nobody offended me"* (Samwel, age 12). When asked why they chose to be circumcised in this program instead of the hospital or clinic, some participants responded that they knew the program would provide these basic necessities which are often not available on the street, for example, *"I choose to come because of shelter, food, and care"* (Waitimu, age 14).

However, the program setting had very basic amenities, and some participants voiced complaints such as *"I didn't like where we were sleeping because of the mattress"* (David, age 13). It may also have been challenging to face the prospect of returning to the streets, for example, *"I would like to be taken home first and then to school after the program"* (Isaac, age 16).

2) Education

Participants had positive views on the education around personal hygiene, *"I have liked the idea of cleanliness from the education"* (Maina, age 13); making good decisions, *"they teach about having good decision"* (Mwangi, age 14); conflict management *"It*

has help him learn a lot in life and know how to live with others" (Joseph, age 15); respect and *"You are special, I am special (a module on self-esteem), "I liked the education bit on respect, am special"* (James, age 12); substance abuse/misuse, *"It has taught me the importance of education and the bad effects of drugs"* (Njomo, age 14); and responsibility, *"It has taught me to be responsible"* (Erico, age 14). Participants also had positive comments about the education on HIV/AIDS prevention and care, and many said they would have liked to learn more.

The facilitators played a large role in SCY's discussion of the education, *"I liked my teachers who gave good advice always,"* (Kipchoge, age 15). However, participants noted that the education was limited, for example, *"more education should be provided since it is very important for our life"* (Paul, age 13).

Facilitators of Participating in the Program.

1) Support During the Healing Process

Few participants commented on the circumcision procedure itself when asked what they liked or disliked about the program, although those who reported positive experiences, for example, *"The procedure was done well"* (Isaiah, age 15). Support during the healing process appeared to be very important to the program's acceptability. For example, one participant explained *"go to the barracks [streets] after the procedure pose danger. But staying for 10 days I would get shelter, food, care, and protection"* (Chege, age 16).

2) Framing the Program as a Coming-of-Age Retreat

Piloting this program as a coming-of-age retreat (instead of the circumcision procedure alone) affected how participants perceived the program. Many talked about becoming an adult, for example, *"it has made me transit from childhood to young adult. To be responsible person in community"* (Francis, age 13). Circumcision outside an exclusively clinical setting was meaningful to many participants. As one participant explained, *"in their culture they are not supposed to be initiated from the hospital as per now he might be considered as an outcast in his father's home"* (Steven, age 18). Boys also discussed the social and cultural benefits of circumcision, for example, *"You can't stay uncircumcised, it leads to stigma from some members of the barracks who are circumcised. Girls wouldn't be willing if you are uncircumcised"* (Ngugi, age 17).

3) Peer influence

Peers had a profound influence on boys' decision to attend the program and be circumcised. When explaining his decision to participate in the program, one participant said, *"I heard about it from my friends and decided to follow them"* (Fredrick, age 14). Being with peers may also have made the boys feel more comfortable, as one participant reported, *"I wanted to do it with my friends and not alone in the hospital"* (Kelvin, age 12). When asked about what they liked, many boys talked about relationships among SCY, for example, *"respect among SCY while at the centre. Being a brother's keeper"* (John, age 13). However, when asked about what they disliked, some also spoke about

conflict: “Other SCY were abusing me and I did not like that at all” (John, age 13).

Discussion

This study was successful at engaging male street-connected adolescents in a 10-day coming of age retreat to provide VMMC and education. It demonstrates that this high risk, hard to reach, and often neglected population can be engaged in educational and biomedical HIV prevention interventions.

This study additionally provides a number of insights into adapting and delivering VMMC and other HIV interventions to SCY in LMICS. Firstly, researchers should consider how the unmet basic needs of these populations affect the acceptability of an intervention. Many SCY in this study would not or could not have participated if food, shelter, and a safe place to heal had not been provided. Secondly, including peers and integrating HIV prevention interventions into existing cultural frameworks may contribute to their acceptability. In our data, participants did not emphasize the intervention’s benefits in terms of HIV/STI prevention, though these were explained as part of the study procedures. However, peer bonding, becoming an adult, avoiding stigma, and being seen as a viable sexual partner did come out strongly as perceived benefits, which suggests a number of more complex reasons than just HIV prevention for wanting to participate in this program. Other studies with adolescents support our findings that peer support for VMMC is important, and that incorporating traditional elements may make VMMC more acceptable in communities where circumcision is traditionally practiced [35–37]. Marginalized youth may value participating in socially/culturally important parts of adolescence as opposed to HIV prevention specifically, and so HIV intervention strategies that incorporate cultural and community elements may be more successful in engaging participants.

Even though this population of SCY is out of school, including educational modules were highly acceptable. Some participants said they would have liked more education, or to go home afterwards. Unfortunately, despite a link to social workers, SCY’s ability to obtain stable housing and education is limited due to poverty, family conflict, and other factors that may have contributed to their street involvement in the first place [3]. It is also worth noting that there were few negative comments about the education or program in general, and no participants commented on whether they realistically had the ability to act on parts of the education (e.g., personal hygiene) on the streets. This absence in the data may be interpreted as SCY’s confidence in the value of the information despite constraints, as an unrealistic expectation, or some mixture of both.

Our results also highlight important ethical challenges. In particular, providing food and shelter may have influenced SCY’s ability to give informed consent for VMMC. However, these supports were necessary to safely implement this minimal risk, evidence-based intervention. Given circumcision’s cultural importance, it is possible that without this program SCY might eventually have undergone circumcision in a less safe environment. In engaging with ethical challenges like these, researchers must balance the risk of influencing participants’ decision-making against the ethical principle of justice [38], which makes it imperative that marginalized young people be included in research that could benefit their health and wellbeing, especially implementation research on providing access to interventions with proven benefit.

This study has several strengths. To the best of our knowledge, this is the first study to explore implementation and acceptability of a VMMC and educational program for SCY in SSA, and one of the only

implementation studies on HIV-prevention interventions in this population. It disseminates knowledge of a novel implementation of VMMC developed specifically for SCY. Secondly, strong pre-existing relationships made it easier to build trust and involve stakeholders, including the SCY community, County Children’s Office, healthcare providers, and community organizations, in study design and implementation. Third, we were able to provide shelter, 3 meals per day, and supervision for all participants for the full ten days of the program. This study has the potential for adaptation in other settings where HIV is endemic, there is a large population of SCY, and circumcision is practiced as part of a traditional culture [39].

There are also some limitations to this study. We were not able to obtain data on this intervention’s long-term impact on HIV incidence or behavioral outcomes. Data quality may have been limited by participants’ reluctance to disclose sensitive information, and errors in on-the-spot translation. Furthermore, despite training emphasizing the importance of recording participants’ responses directly, interviewers may have intentionally or unintentionally introduced social-desirability bias. Participants may have feared their answers would affect their ability to participate in future programs. However, the research team has engaged for over a decade with the population, increasing community buy-in and, potentially, limiting responder or interviewer bias.

Innovative adaptations and solutions are needed to make evidence-based HIV prevention interventions accessible to the hardest-to-reach and highest risk populations. This research demonstrates that providing VMMC to male SCY as part of a ten-day healing, education, and coming-of-age retreat was highly acceptable. Addressing participants’ basic needs, incorporating traditional elements, and including peers were identified as important factors in making this program acceptable. This intervention could be considered for adaptation for SCY in other VMMC-priority countries in SSA where circumcision is part of traditional coming-of-age processes.

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