

“Some people fear injection and others don’t want to swallow tablets, while others forget”: Health care provider perspectives on the PrEP (dapivirine) ring in rural Uganda (“ProPrEP”)

Erica L. Gollub

egollub@pace.edu

Pace University

Marie L. Charles

Pace University

Esther Nakyaze

Catholic Relief Services

Marc Sklar

Babies and Mothers Alive Foundation

Murokora Daniel

Babies and Mothers Alive Foundation

Research Article

Keywords: HIV prevention, pre-exposure prophylaxis, PrEP, dapivirine ring, PrEP ring, young women, AGYW, Uganda, microbicides

Posted Date: March 2nd, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-8940405/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

BACKGROUND

Adolescent girls and young women (AGYW) remain disproportionately affected by HIV globally, accounting for over 60% of adults living with HIV in sub-Saharan Africa (SSA). Expanding the choice in pre-exposure prophylaxis (PrEP) methods is essential for this population, whose autonomy is often constrained by entrenched gender norms. The dapivirine or PrEP ring is now approved in eleven SSA countries, including Uganda. While prior studies have focused on potential users, little is known about healthcare providers' perspectives despite their central role in impacting its uptake. The aim of this study was to explore the knowledge and perceptions of health care providers (HCPs) regarding the dapivirine ring for use by AGYWs in rural Uganda.

METHODS

The study utilized a qualitative cross-sectional design. Sixty government HCPs from the Rakai and Kyotera Districts were recruited from the directory of a locally-led, non-governmental organization focused on maternal and newborn health systems. Six focus group discussions (FGDs) were conducted using a hybrid approach, combining in-person and virtual participation. Participants included nurses, midwives, and community health workers. FGDs were transcribed and analyzed using thematic analysis.

RESULTS

Study participants comprised 25 nurses, 18 midwives, and 17 community health workers (45 females, 15 males). Themes included: user preferences of AGYW PrEP users, health promotion and education challenges; structural, policy and legal considerations; and attitudinal barriers. Participants cited advantages of the PrEP ring as a discreet, non-hormonal method relieving pill-related and HCP burden, due to the potential to reduce the number of visits to healthcare facilities. They expressed concerns regarding certain physical aspects of ring; addressing community and partner stigma; PrEP ring stockouts; and governmental sex education policy. HCPs of all cadres underscored the vital role of men as method champions and the corresponding role of HCPs in educating them.

CONCLUSIONS

HCPs demonstrated a high level of interest in and enthusiasm for the PrEP ring as a valuable addition to existing HIV prevention options for AGYW. Providers perceived the ring as particularly well suited to address barriers associated with current PrEP modalities. Male involvement in promoting the method and supporting partners in its use was considered critical to success.

BACKGROUND

Adolescent girls and young women (AGYW) continue to be disproportionately affected by HIV globally. In sub-Saharan Africa, AGYW account for more than 60% of adults living with HIV, and one in four new infections occurs among women aged 15-24 years, despite the fact they constitute only 10% of the population [1]. Uganda's HIV prevalence was reported as among the highest in SSA [2]. HIV prevalence among young women 15-24 years

stands at 2.9%, compared with 0.8% among young men, and annual incidence is likewise highest among young girls compared with older women or men.

Young women's HIV risk stems largely from entrenched gender norms that restrict women's autonomy and mobility and reinforce submissive sexual behaviors within a patriarchal context. These norms, limit AGYW's power to negotiate for safer sex practices [3-5]. Advances in biomedical approaches to HIV prevention in women, especially microbicides, seek to expand women's opportunities for flexibility and autonomy within this harmful social and structural environment [6]. An integrative approach combining both biomedical and social/structural interventions is required to achieve the most impactful and enduring change.

The dapivirine vaginal ring is a critical new HIV prevention method with the potential to enhance choice and support a wider pre-exposure prophylaxis (PrEP) menu. The ring is a monthly silicone vaginal device that protects cisgender women against HIV acquisition during vaginal sex [7]. Eleven SSA countries have approved the ring for marketing, with implementation studies underway. The European Medicines Agency recently recommended extending the indication to women from 16 years of age [8]. Data from open-label extension studies reported high uptake and suggested improved use and greater efficacy, with an estimated 62% reduction in HIV incidence compared with the earlier, pivotal efficacy trials [9-11]. In a Zimbabwean demonstration study offering young women a choice of the ring vs oral PrEP, the ring was more popular; no difference in (low) subsequent HIV infection rates between arms was found at six months [12].

Provider studies

HCPs play a critical role in shaping access to and uptake of HIV prevention technologies. While sizeable literature is available reporting on provider perspectives and experiences with oral PrEP, there remains a notable gap in studies assessing provider perspectives on the PrEP/dapivirine ring.

Studies probing HCP attitudes and perspectives on the provision of PrEP to AGYW have often been conducted during early implementation phases. Although providers have expressed enthusiasm and support for PrEP delivery generally, a common reservation across many of these studies was about promoting or providing PrEP to young girls. These concerns frequently reflect moral judgments about adolescent sexual activity and fears of risk compensation, such as reduced condom use following PrEP initiation. Consequently, some providers have favored targeting PrEP delivery to young women in narrowly defined, high-risk groups, such as sex workers or women in serodifferent relationships [13,14]. In Kenya and South Africa, efforts to support HCPs to align their personal values with professional goals, and develop a deeper understanding of risks facing AGYW, expanded their willingness and commitment to PrEP provision [15]. Stigma emerged as a common theme, including stigma associated with use of PrEP for AGYW, presumed HIV positive status, and presumed sexual promiscuity [16]. In Kenya, providers reported the need to educate the male partners and parents as a prerequisite step to PrEP provision [17].

Structural barriers to PrEP access and sustained use have been widely documented, including high health provider turnover, long distances to health facilities, supply shortages, and inadequate training [13,15,17]. Some providers have expressed fear of being blamed for PrEP failures due to non-adherence beyond their control. In response, PrEP service delivery models in these settings transitioned from clinic to home or community locations. In Uganda, HCPs identified infrastructure barriers, including storage spaces and record-keeping systems [14].

At the time of this writing, only one published study had examined provider attitudes toward the PrEP ring. In that study, HCPs were enthusiastic about providing AGYW with a choice in PrEP options but voiced concerns about the lower efficacy of the ring compared to oral PrEP, clients' ability to insert and remove the ring and return on time for resupply [18].

At the time of the present study, the PrEP ring had been approved by the Ugandan Ministry of Health and was being launched in selected demonstration sites. None of the study participants – despite extensive experience in oral PrEP counseling and provision - had prior knowledge of the ring. The Provider Perspectives of PrEP Ring (ProPrEP) study aimed to describe the attitudes and perspectives of health care providers trained and experienced in caring for young, often unmarried, mothers toward the PrEP ring, as well as provider values on young women's sexuality and agency as it was impacted by the ring. A secondary goal was to identify preliminary areas for education and outreach for providers, to increase the likelihood of quality counseling and uptake.

METHODS

Study Design

The study utilized a cross-sectional design to qualitatively explore the knowledge and perceptions of facility and community health workers regarding PrEP use, specifically the dapivirine ring, and their use among adolescent girls and young women (AGYW).

Study Setting

This study conducted in the Rakai and Kyotera Districts represented a collaboration of Pace University and the Babies and Mothers Alive Foundation (BAMA), a Ugandan-led non-governmental organization dedicated to improving the quality of reproductive, maternal, and newborn healthcare. Both are rural districts in the southwestern part of the central region of Uganda. These two districts had a population of 538,546 as of 2024 and adolescents accounted for 20% of all pregnancies in the region based on the Uganda Demographic and Health Survey. [19, 20] The districts have continued to experience higher HIV prevalence compared to the national average [21]. During the period 2021 to 2023, BAMA provided extensive health promotion services in these districts, including cervical cancer screenings, Human Papilloma Virus vaccination, and transportation to health centers as well as care of newborns at BAMA constructed NICUs. Additionally, BAMA has trained mentor midwives and nurses who mentor healthcare professionals working at the government and private level. At the village level, the program uses community health workers (known as Mama and Papa Ambassadors), who connect the community members to health services [22].

Ethics and Data Confidentiality Procedures

Ethics review and approval was obtained from Mildmay Uganda Research & Ethics Committee, Uganda National Council for Science and Technology, and Pace University Institutional Review Board. Ethical and administrative clearance was obtained from the district health offices of both Rakai and Kyotera Districts prior to the commencement of data collection. These letters of clearance authorized the research team to conduct the study within the respective districts and to engage with relevant health facilities.

All participants provided written informed and audio consent prior to their inclusion in the study. Before participation, each individual received a detailed explanation of the study's purpose, procedures, potential risks,

and benefits, as well as assurances regarding their rights to withdraw at any time without penalty. To protect participants' privacy, strict measures were implemented to ensure confidentiality and anonymity throughout data collection, analysis, and reporting. Identifiable information was removed or pseudonymized, and only aggregated data were presented in the findings. All audios and transcribed data were stored on password-protected, encrypted drives accessible only to the research team, while hard copies of consent forms were securely locked in a restricted-access cabinet. The dataset generated and analyzed during the current study is securely archived and can be made available from the first author upon reasonable request. Consent to publish anonymized quotations and study findings was obtained during the initial consent process.

Sampling Procedures

Using purposive sampling, the local study staff person (who was also the local PI) recruited nurses, midwives, and community health workers (CHWs) from ten health facilities in the Rakai and Kyotera Districts. Participants were recruited from the registry of health care providers associated with the BAMA Foundation work, and contacted via email, text messages, and phone calls. Inclusion criteria consisted of adults 18 years or older, being proficient in English, and working at a facility supported by BAMA for at least three months. Participants were considered for the study based on the availability of different cadres of health workers, and willingness to participate. A total sample of 60 individuals consisted of 45 females and 15 males; 18 enrolled midwives, 14 enrolled nurses, 16 CHWs, 2 BAMA mentor midwives and 4 registered nurses and 6 nursing officers.

Data Collection Materials and Methods

A semi-structured Focus Group Discussion (FGD) guide was developed, pre-tested, and finalized by the study Principal Investigator and co-PIs (ELG, MLC and EN). The guide focused on the perceptions (if any) of the added value of the PrEP ring, HCP and predicted AGYW questions and concerns about the method, difficulties or barriers expected for clients to learn about and use the ring, responsibilities of HCPs, differences in attitudes across HCP levels, and hurdles expected for successful promotion of the ring. At the start of each FGD, placebo rings (Population Council, New York) were distributed, and participants were free to inspect and handle them throughout^[1]. The rings were collected at the termination of the session.

Focus Group Discussions (FGDs) comprising 7-12 members were conducted from October to November 2024. Each FGD was conducted in person with the participation of the PI and/or Co-PI via the Zoom platform. A local study staff member facilitated the session onsite, responsible for assembling participants, obtaining written or audio-recorded informed consent, and taking detailed written notes during the discussion. The local staff also oversaw a backup audio recording to safeguard against potential internet connectivity issues and managed participant compensation and session closure procedures. The participant experience included a study-subsidized lunch, followed by formal study enrollment, the FGD and study close-out activities. Each FGD lasted approximately 1.5 to 2 hours and was recorded through the Zoom platform. These recordings were accessible only to the study investigators and were used solely for transcription and subsequent qualitative analysis. Backup audio recordings were used only if necessary, during transcription or analysis and were permanently deleted following the completion of data analysis to maintain participant confidentiality.

Prior to the start of the FGDs, study participants were administered a structured demographic survey tool, developed to capture details of age, educational level, cadre (role at health facility), and number of years of experience in BAMA supported health facilities. Additionally, informational pamphlets developed by the Catalyst

Study [23, 24], a US Agency for International Development (USAID) study funded through US President's Emergency Plan for AIDS Relief (PEPFAR), were provided to the participants prior to the discussion to orient them to ring basics.

Data Management & Analysis

All paper-based materials, including consent forms, were scanned and stored to ensure data security and accessibility. The original hard copies were organized in binders and stored in a locked facility with restricted access at the BAMA offices. Audio recordings from FGDs were stored on password-protected devices by the local study staff and shared with the Principal Investigators (PIs) through an encrypted shared folder. These data remained encrypted throughout transcription and analysis to maintain participant confidentiality.

Data from the focus group discussions (FGDs) was transcribed verbatim using Microsoft Word. The transcribed data were reviewed by the investigators to ensure completeness and accuracy. Conventional content analysis was utilized. Investigators read and re-read the transcripts to immerse themselves in the data. Recurrent words and phrases were grouped together. The smallest segment of text or phrases reflecting a participant's meaning represented the unit of analysis [25]. The investigators developed a codebook of initial codes using statements and phrases extracted from the transcripts [26]. Difficult-to-code segments were discussed with the investigators to achieve consensus. The data were organized and emerging themes were identified.

The qualitative findings were presented using de-identified participant quotations to illustrate the central themes and highlight the range of perspectives shared. Quantitative data collected through the demographic tool were analyzed descriptively using Microsoft Excel. The results were summarized in tables and descriptive statistics (frequencies and percentages) to provide context to the qualitative findings. The linkage between quantitative and qualitative data was maintained through participant study numbers to ensure integration across data sources.

RESULTS

Demographic Characteristics

The study consisted of 60 HCPs with 10–12 participating in each group discussion. There were a total of 15 males and 45 females, with a mean age of 39 years and average years of affiliation with BAMA at 4.6. Nearly half of the participants held a diploma (48%), while 45% had secondary-level education. (see Table 1).

Table 1
Demographic characteristics of study participants (n = 60)

Characteristic	Frequency (N)	Percentage (%)
Gender		
Female	45	75
Male	15	25
Age group (mean 39 yrs)		
19–24 years	1	2
25–35 years	23	38
36–45 years	19	32
45 years	17	28
Level of education		
Bachelor's degree	4	7
Diploma	29	48
Secondary	27	45
Have Children		
No	4	7
Yes	56	93
Role in BAMA-F Supported Health Facilities		
BAMA-F Mentor Midwife	3	5
Community Health Worker/Mama/Papa Ambassador	17	28
Enrolled Midwife	15	25
Enrolled Nurse	14	23
Nursing Officer	7	12
Registered Nurse	4	7
Years Working in BAMA-F Supported Health Facilities (mean 4.6 yrs)		
1–4	27	45
5–9	31	52
≥ 10	2	3

Added value of the ring

Several themes were identified in participants' responses regarding perceived added value of the ring compared to available options. Many comments highlighted user preferences often noted in studies of AGYW users (see

below), such as women's control of protection, and the discretion afforded by an internal, long-term method, as well as added privacy.

"Some girls can use it, and other people will not know that they are using it." **Nurse, female, 50 yrs.**

"I think, it can be inserted at any time and if people are taught to, they can insert it themselves." **Nurse, female, 27 yrs.**

"... women have been worried of men piercing the condom which has led to impregnating the young girl" **CHW, male, 39 yrs.**

Many participants emphasized the benefits of the PrEP ring over other prevention methods, particularly the daily pill burden of oral PrEP and expected better adherence with the ring.

"I think for the pills, someone would take [it] daily. However, for the PrEP ring, someone will insert it themselves and thus no one will know that someone has the ring or even has multiple partners." **Nurse, male, 30 yrs.**

"I think it will add value because some people fear injection and others don't want to swallow tablets while others forget. I think it will add value because it will reduce the pill burden." **CHW, male, 37 yrs.**

"In addition, with the ring, adherence will be easier compared to other PrEP methods such as the pill where you need to know the actual time [to take it]. Once the ring is inserted, it will stay inside for up to a month." **Nurse, female, 38 yrs.**

Participants frequently highlighted stigma associated with oral PrEP use and anticipated that the PrEP ring would substantially reduce stigma due to its discreet, non-visible nature.

"According to the people getting the tablets, some, they get stigmatized. I think the ring will reduce stigma because once it's inserted, no one can see it." **CHW, male 46 yrs.**

"Since we all know that the pills used for PrEP are the same for positive clients, it results into some stigma. The PrEP ring will reduce this stigma." **MW, female, 33 yrs.**

"Some clients face side effects like nausea and vomiting. I think this ring will have minimal side effects." **MW, female, 30 yrs.**

Other themes sounded by the participants included an expected reduced burden for HCPs as well as for clients, in relation to other methods requiring a higher level of healthcare system interactions.

"This ring will reduce the burden of clients moving to the health facility and thus reducing transport costs." **CHW, male, 48 yrs.**

"I think it's going to reduce the burden on health workers, if we train the women or young girls, these can insert it as well. " **MW, female, 30 yrs.**

As reflected in the testimonials above, we could discern no notable differences by HCP cadre in the themes raised.

HCP and client concerns about the ring

Not surprisingly, many questions and concerns were raised about the ring as an entirely novel PrEP method. HCP questions often overlapped with perceived client reactions and revolved around both acceptability, counseling points and clinical issues. Numerous participants had questions about the size and feel of the device and potential user discomfort and/or negative reactions of the partner.

"The size may be a hurdle; the ring is big. In addition, the duration may be an issue as well. One month may be short for mothers." **Nurse, female, 47 yrs.**

"Can't the ring bring irritation to partners (spouses), isn't it uncomfortable for men, can the men bring it out during sexual intercourse?" **Nurse, female, 53 yrs.**

"I think people may fear that the ring will cause discomfort, especially when someone is walking." **MW, female, 27 yrs.**

Potential partner concerns about vaginal size changes and changes to vaginal lubrication were expressed, often by men.

"My concern on this ring is the size. This would enlarge the size of the vagina, yet men love tight vaginas." **CHW, male, 44 yrs.**

"Community will ask whether the ring will result into virginal [sic] dryness since most men in Africa love lubricated women." **CHW, male, 37 yrs.**

"The men may think that the ring may enlarge the size of the vagina." **Nurse, female, 38 yrs.**

Another theme frequently expressed involved clinical considerations and contraindications, including whether ring use was contraindicated in cervical cancer patients, whether the ring could cause or aggravate cervical cancer, and similar concerns regarding STIs and existing genital lesions.

"My other question is, if someone who was previously treated for cancer can use the PrEP ring." **MW, female, 38 yrs.**

"Some may fear getting Sexually Transmitted Infections (STI) because it stays in the vagina for a month and the hygiene for many women may not be good because of scarcity of water. Some have candidiasis and this may affect them from using the PrEP ring. Another question will be if it can cause cancer of the cervix?" **MW, female, 34 yrs.**

"I think people will ask about STIs; will it work if someone has STIs?" **MW, female, 27 yrs.**

Numerous questions and concerns centered around IUD use: whether the ring could be used with the IUD and the need to carefully distinguish the PrEP ring from the IUD. Participants referred to prevailing myths about the IUD that impeded its wider use and which might affect perceptions of the ring. There were associated important counseling points raised about contraception more generally, including whether hormonal compounds were involved.

"Community will ask if the ring can be used together with IUD." **CHW, male, 49 yrs.**

"People may confuse the PrEP ring to the family planning methods, the IUD in particular." **MW, female, 35 yrs.**

"It is therefore important to know whether the ring is hormonal vs non-hormonal. Sometimes clients react to some of the hormonal methods." **CHW, female, 30 yrs.**

"I think of questions from mothers using the IUD: can it be safe if inserted in a woman with the IUD as a family planning method. Is there no drug interaction..." **Nurse, female, 24 yrs.**

Finally, several questions focused on the ring's effect on breastfeeding, reflecting the HCP's training and experiences with that specific population.

Difficulties or barriers for women to learn about and use the ring

Although we tried to probe separately the barriers for AGYW to *learn about* versus to *use* the ring, the themes sounded in participant comments tended to overlap considerably and they are presented together here.

In the broadest terms, participants mentioned a great number of different structural constraints for girls and women seeking out and using any PrEP, including strict policies on health education, aspects of patriarchal culture affecting policy and practice, community stigma around HIV/AIDS, and health promotion and education challenges to dispel myths and improve provider attitudes toward the target population.

"The school's sexual and reproductive information is compromised by the government policy. The students are sexually active, but the policy doesn't accept to talk about other HIV prevention methods except abstinence." **MW, female, 38 yrs.**

"Most of the young people are in boarding schools, this may affect them from getting information, looking at the current government policy on sexuality...it will be better to involve heads of schools. The students are already sexually active and we need to engage them." **MW, female, 32 yrs.**

In terms of cultural constraints, many comments evoked male control that restricted women's movement and autonomy and impeded their ability to make health care facility visits. The hidden and long-acting nature of the ring was appreciated by participants, with strategies such as a multi-month supply suggested to offset the restrictions in travel by partners or family.

"Gender issues in African culture will be a barrier; girls or women must be submissive. Sometimes the men may not allow the girls or women to access information. There will be a need to sensitize men about this method even before the women. Once men buy in, they will accept their girls and women to use the method." **Nurse, female, 50 yrs.**

"In Africa, the ladies consult their husbands before taking on health services. Once the information has not been well given to the men, the men may not accept their women to use the ring." **Nurse, female, 38 yrs.**

"... reactions from the husbands may include threats to the women. This may result into Gender Based Violence." **MW, female, 34 yrs.**

Religious constraints were also evoked as a barrier to learning about the ring. Here, the fact that the method was not contraceptive in nature was an advantage, according to some. HCPs conveyed the experience of working nimbly around the existing constraints in matters of sexual and reproductive health.

"I once worked in a hospital which was under the Moslem community; they used to burn boxes of condoms because they looked at it a family planning method. But since HIV is now rampant, some take it on once information is provided to them." **Nurse, female, 38 yrs.**

"We can use religious leaders, youth leaders and target them in their evening bars where they enjoy evening moments. This will create good informal discussions." **Nurse, female, 50 yrs.**

Community and parental stigma were frequently cited as barriers to AGYW seeking out, initiating and maintaining PrEP usage.

"Maybe stigma may come from the community myth that whoever uses the ring may be having many partners." **Nurse, male, 30 yrs.**

"The young mothers getting the ring may be stigmatized; this is because they may be seen as prostitutes in the community." **CHW, male, 49 yrs.**

"Some parents who haven't been open with the children may feel uncomfortable to support their children to access the information about the PrEP ring." **Nurse, female, 50 yrs.**

Finally, negative provider attitudes, especially in relation to AGYW, were recognized across different cadres, sometimes with accompanying anecdotes (note, below, all unique individuals).

"I think the young women will fail to get information because they don't want to go to health facilities and sometimes when they go to the health centers, the nurses may deny them information about the PrEP ring." **CHW, male, 37 yrs.**

"If we [health workers] have a poor attitude to the young people, they will not be interested in getting the ring...for example, when they mix the young girls with women as they provide services or shouting at young girls on why they would want to accept the HIV prevention method, including the ring." **Nurse, female, 38 yrs.**

"I think one of the barriers will be poor attitude by health workers; if young girls are shown a poor attitude and wondering why the young people need the ring. The young people may not come back." **MW, female, 35 yrs.**

The need for quality HCP training was also commonly endorsed here and throughout the discussion (e.g. see below, "Hurdles" question); training was seen as a way to improve HCP attitudes and reduce barriers to ring use.

Responsibilities of health educators and health care providers

Themes identified here centered around the responsibility for health education and promotion and responsibility to address clinical concerns.

Health education and promotion. Most comments cited the HCP's role to promote awareness, provide correct information as well as to dispel myths among the young mothers and community; and to mobilize the men.

" My responsibility is to give out any relevant information about the ring, do sensitization to the community members for them to be aware about the ring, [and] sensitize the men to minimize resistance." **MW, female, 38 yrs.**

" Our role as health workers is to provide counseling and information to the young mothers about the ring" **Nurse, female, 50 yrs.**

"...In Uganda, some people start sex early at about 9 years, thus [the] need to start telling the young girls" **CHW, male, 37 yrs.**

"My responsibility....is to tell the men to allow their wives to use them" **CHW, male, 50 yrs**

Provide clinical oversight. Participants also spoke of the need for clinical oversight, such as treating STI's and verifying HIV negative status before ring initiation. Feelings about whether girls and women should be screened for "at risk" status was mixed, with most seeming to agree that all should receive information about the ring, with no pre-selection, with one participant explaining that at risk status may change at any time.

"My role is to dispense the method and even monitoring the clients to ensure that she has used it well, give information and ensure that it is working." **Nurse, female, 31 yrs.**

"[My responsibility is] ...to identify the clients at risk, give them information about the ring and let them make the informed decision....we have those with multiple partners, discordant relationships..." **Nurse, female, 38 yrs.**

"When I screen my client even they are at risk or not, I must continue giving the information about the HIV prevention methods. These people may be at risk at any point in time." **Nurse, male 30 yrs.**

"My role is to screen and to make sure that the clients using the ring are HIV negative." **Nurse, female, 31 yrs.**

Difference across HCP cadres in attitudes about sexuality and HIV prevention

We asked about any perceived differences across levels of HCPs - such as differences in training, education, culture, or other areas - that might affect the quality of counseling of young women. There appeared to be nearly uniform agreement that any differences would be due to personality of the individual HCP and their relationship with their client. Further, it was emphasized in comments that HCP attitude depended on correct and comprehensive HCP training.

"There will be no difference across cadres. It's more of personality." **MW, female, 43 yrs.**

"Level of education doesn't matter, the relation between the health worker and young, unmarried women is very important." **MW, female, 27 yrs.**

"Attitude can improve when someone has the right information." **CHW, male, 40 yrs.**

For this question, it was not clear whether participants were indicating that education about facts of the ring would be enough to change more conservative values (attitudes) regarding sexuality of young people and the need to provide AGYW with HIV prevention information, or whether the "training" and "information" referred to included values training, in the minds of the respondents. For reasons of time, we did not seek to clarify this point.

Also frequently mentioned was the notion of time availability and space for private conversations, with varied points being made. A few CHWs spoke about nurses and midwives having less time to spend with clients as compared to them. Numerous participants pointed to the advantages of direct community contact of CHWs with clients.

"The health workers can give the right information but the issue is they don't have time. This limits how much they will engage with the young mothers." **CHW, male, 37 yrs.**

"It depends on the available of the time and self, but not cadre of staff..." **MW, female, 34 yrs.**

Several nurses pointed to their professional training as a plus, as compared to CHWs; as well, the availability of private spaces and stronger assurance of confidentiality were mentioned, but attitudes were mixed on this with some respondents finding enough assurance of confidentiality in the underlying ethical code of conduct for any health worker (note, below VHT is the local term for CHW).

"The way we counsel differs, health facilities have spaces for privacy." **Nurse, female, 40 yrs.**

"You can't compare the nurses and VHTs. VHTs may be non-ethical and yet the nurses are ethical and WILL keep all the information from clients confidential." **Nurse, female, 53 yrs.**

"According to the ethical code of conduct, health workers are supported to be understanding, thus need for the health workers to professionally handle the clients. The difference will mainly be in personality not cadres." **MW, female, 35 yrs.**

Added value of peer counseling for young women

Participants overwhelmingly supported the use of peer counseling for the young women, citing its value in providing sufficient time with the clients, clarifying information, reducing stigma and improving self-esteem. As well, peers were seen as very important messengers to parents and the larger community, changing attitudes and thus empowering young women to seek out and use the ring. The fact that peers came from the same communities as the clients was raised repeatedly.

"Peer counseling would improve self-esteem and confidence." **Nurse, female, 44 yrs**

"...these peers will help us once the health workers give the PrEP rings to the clients; they will help with follow up since they live in the same communities with the clients." **Nurse, male, 30 yrs**

"I think peer to peer counseling can work because these are agemates and having the same challenges, the peer will pass on the information and others will trust the information." **CHW, female, 30 yrs**

"Getting information from the person who has ever used the services promotes good adherence, here side effects and solutions can be discussed." **MW, female, 37 yrs**

A few participants mentioned the necessary training and adherence to confidentiality protocols for any peer counselor; this was not a major concern.

Biggest hurdle for HCPs to successfully promote the ring

Not surprisingly, the three main themes that emerged from this section of our discussion were structural issues (including resources), HCP training, and the need for media outreach for health promotion.

Structural issues and resources included the threat of stockouts (here and throughout the FGD in other contexts) that worked against good adherence and method continuation, especially in light of the long distances clients needed to travel to reach a health center in the rural setting. Also mentioned were the need for supplies such as

gloves, testing kits, other needs for ring insertion. In addition, the need for visual aids, such as t-shirts (to identify CHWs) and, videos, pamphlets, and other instructional, educational, and counseling (IEC) materials were referenced. Finally, paid transport to navigate long and difficult terrain in rural communities was mentioned.

"My point is about the stock out because a person may move over 5KMs to take a service and if they don't find it, clients may not come back." **MW, female, 34 yrs.**

"In Uganda, the community health workers are not paid, we don't have transport and Uganda is a very hilly country. We will need transport to travel from house to house to inform people about the PrEP ring." **CHW, male, 50 yrs.**

"Visibility materials will be informative, making people identifying the VHT's, such as uniforms (T-shirts) and other items which show what we do as VHTs in regard to the ring. This will give us a certain authority." **CHW, male, 39 yrs.**

"As a male VHT ... how will I demonstrate how to use the ring?" **CHW, male, 50 yrs.**

The need for comprehensive training and refreshers for HCPs was also cited, given that ring availability was limited to selected sites for demonstration studies at the time of the study.

"Right now...we will need for more training about the ring" **MW, female, 35 yrs.**

"I think the need for training and refresher training such that the providers continue to be conversant with the message and method." **CHW, male, 48 yrs.**

Finally, media outreach, such as radio and television, and community wide printed materials disseminated in churches and other community sites, was frequently mentioned.

"Once the government has embraced the ring, Ministry of Health will need to use the radio and televisions to provide information to the community about the ring." **CHW, male, 39 yrs.**

"There is a need to disseminate information through mass media, so that people will get information even before coming to the health facilities." **MW, female, 32 yrs.**

DISCUSSION

Study participants expressed enthusiasm about the PrEP ring and eagerness to start training and promoting the new method. They uniformly emphasized the need for additional options for AGYW, citing side effects and adherence problems with existing oral PrEP for a substantial proportion of users. In addition, the pronounced challenges associated with living in a patriarchal cultural context, especially for this age group, made the discreet and long-acting aspects of the ring an attractive alternative. Participants also noted benefits for both HCPs and end users, including reduced frequency of health facility visits.

These perceived advantages align closely with findings and agree in large part with responses from HCPs in Hettema et al. [18], in which the HCPs identified the ring to be responsive to client needs and feasible to deliver. In addition, ring users in that study reported the ease of use, no need for a daily pill and the ability to use it discreetly as the most influential factors for selecting the PrEP ring.

Studies among AGYW users have likewise shown that the ring reduced the need (or immediate need) for immediate disclosure of HIV prevention methods use to partners, family, and/or friends, helping to mitigate stigma [17, 27]. In Zimbabwe, users reported that the user-controlled, long-acting nature of the ring offered a distinct advantage over other methods, particularly in settings with limited access to healthcare facilities especially in rural areas [28]. Comparative studies have also demonstrated greater persistence with the ring than oral PrEP [28, 29].

Several questions and concerns raised by our study participants agreed with findings in prior studies of HCPs and PrEP, specifically regarding the ring [18]. These include worries about comfort related to physical aspects of the device and potential impact on sexual pleasure of AGYW and their partners. Our study participants questioned whether young girls would return in time for three-month resupply visits. In Hettema et al. (2025), recommendations from both providers and users contributed to Eswatini's adoption of a 6-mo dispensing schedule, demonstrating the value of incorporating multiple stakeholder feedback in new PrEP policy development [18] and echoing the consensus from a wider stakeholder audience on the importance of demedicalizing delivery of the PrEP ring [30].

The concerns about discomfort by young users underscored the need for tailored counseling. In a South African demonstration project, younger women were less likely to choose the ring as compared with the oral PrEP, likely reflecting the novelty of a vaginal device as a delivery system and concerns about possible discomfort or perceived difficulties in use [29]. In the original Phase III pivotal trials of the ring, younger users had far lower efficacy rates as compared with older users, ultimately ruled as due to poor compliance [9, 10]. Follow-up studies with ring users have demonstrated that initial difficulty or perceived discomfort is short-lived [18, 31, 32].

More broadly, recurring themes of myriad structural challenges, as well as deep-seated stigma around AGYW sexual behavior and HIV/AIDS, resonate strongly with existing literature. Structural challenges include stockouts, long distances to a clinic and partner or familial control of movement. Stigma - both internalized and community and partner-based continued to impede AGYW from seeking out information or initiating PrEP use. In existing PrEP user studies (most of which focus on oral PrEP), husband and partner opinions are cited as key determinants of use, owing to AGYW's financial and emotional dependence on their partners [33]. Users frequently reported that emotional and instrumental support from men could increase use of PrEP.

Our results diverged from a number of prior studies of HCPs. In Hettema et al. [18], providers were concerned about the cited lower anti-HIV efficacy of the ring compared to the PrEP pill, no such concerns emerged from our study. Numerous prior studies of HCPs uncovered concerns that offering PrEP would promote risky sexual behavior among AGYW, with some HCPs feeling comfortable undertaking such counseling only with young women over a certain age (e.g. 18 years) [16] or those belonging to clearly identified key populations (e.g. sex workers and HIV discordant couples) [13, 14]. In our study, however, participants didn't express any concerns about promoting sexual promiscuity or risk compensation. To the contrary, several emphasized the need to initiate sexual health counseling at a younger age. For example, a CHW in one session suggested that safe sex education should start at age 9 years. Consistent with this perspective, data collected among Ugandan women enrolled in The Ring Study indicated no evidence of risk compensation with the PrEP ring [34].

However, our participants regularly cited examples of inappropriate, negative and chastising behavior – adultism [6] - on the part of other HCPs they had witnessed. We believe the difference in attitudes about sexuality represented here versus in prior studies likely lies in the extensive training offered by the BAMA organization,

including exposure to concepts such as gender-based violence and gender-power differentials (see below, Limitations).

Participants raised a few ring-specific concerns: a worry that users would confuse the ring mode of operation with that of the IUD (and the attendant worry that contraceptive efficacy of the method might be wrongly assumed), as well as those concerning use among women with a history of cervical cancer. Considering the relatively high prevalence of cervical cancer in SSA [35], the collected feedback warrants focused attention to these issues in training points to HCPs as well as in counseling guidelines to users. These HCP concerns mirrored recent findings from a South African demonstration study offering a choice of PrEP methods, where younger women (18–24 years) and those with symptoms or signs of sexually transmitted infection were less likely to choose to initiate ring use [29]. The authors note that this might reflect a response to product guidelines that advise a delay in ring initiation in the presence of ulceration, pain, or discharge. They nevertheless felt this to be a barrier to ring use given the elevated prevalence of women presenting with signs and symptoms combined with excessive HCP caution.

Overall, our findings reinforce those of other studies emphasizing the need for high level and continuous provider training in PrEP; as well as creative ways for providers to try to work within the web of structural constraints for this population. Such training on the individual level would include data on end users' experiences with ring and thus respond effectively to concerns about women's self-efficacy inserting the ring, comfort with the ring during sexual intercourse, and pleasure for the woman and partner, etc. Real-world data from studies among ring users have already shown that such concerns subside once potential users have strong and consistent support from HCPs [8, 29, 36].

Study Strengths and Limitations

Our study has numerous strengths. Our participants consisted of providers well-versed in care for girls and women at high risk of HIV living in often remote, rural areas of Uganda. These AGYW, facing high stigma and entrenched cultural barriers, as well as structural barriers to access health facilities, have a pronounced need for a full range of choices for PrEP to adapt to their risk context. Furthermore, our participants comprised 3 provider levels, all naïve to the PrEP ring; we collected first-time impressions likely to arise when the ring is first introduced in demonstration projects throughout sub-Saharan Africa. The providers were separated for the FGDs, potentially allowing freer expression within rank.

Finally, our study represents an important advance in methodology for conducting hybrid FGDs. The collaborative relationship with the community-based organization, BAMA, enabled the team to assemble all participants in the same physical location. This approach facilitated the collection of important intangible data, including interparticipant reactions and chatter, which are not readily observable with other qualitative online FGD designs. Additionally, a shared lunch was offered to each group, encouraging interaction. Participants in this study shared prior BAMA training and experiences, thus boosting inter-group trust. Generally, studies in which participants log in from remote, separate locations are at a disadvantage when observing and leveraging group dynamics. Key characteristics of the face-to-face FGD technique are that participants communicate with each other, share perspectives, beliefs, or values, and at times re-examine their understanding of a topic and experiences [37]. The ProPrEP research approach thus explored participant interactions comparable to face to face. Additionally, online FGDs could potentially pose privacy issues. When participants are logged on at different locations, they might inadvertently allow access to their personal space and family by not blurring their backgrounds. Another untoward

possibility is a participant recording the interactions without permission [38]. These issues were avoided by having everyone in one location. The fieldwork team consisted of an offsite PI and co-PI and an onsite investigator/moderator (EN) who worked in conjunction with an IT assistant associated with BAMA to implement the group sessions. Visual and audio contact was maintained with offsite investigators, onsite investigator, and participants throughout the sessions. This study represents an approach to qualitative inquiry that ensured validity and depth of data collection, while remaining cost-effective and highly feasible. Members of the research team who were not involved with the focus groups evaluated the study. Investigators maintained notes on format, data collection, and analysis. Team members came to consensus on the meanings of phrases, themes, and subthemes. Finally, our sample size was adequate to achieve thematic saturation across different provider levels.

Our study also has certain limitations, related in part to the above discussion. Our participants are likely to differ from the average Ugandan health provider, as they were drawn from government health facilities that partner with the NGO co-collaborator for this study, BAMA Foundation. The foundation seeks to improve the quality of reproductive, maternal and newborn care, which entails training on a wide array of sexual and reproductive health topics, including, for example, gender roles and gender-based violence, making them more informed than most health workers in Uganda. There were three categories of health providers, Midwives, Nurses, and Community Health Workers (CHWs). The 17 CHWs have been trained as BAMA “Mama and Papa Ambassadors” and received training and mentoring over the past 3–5 years. Three of the 18 midwives participating had been trained as BAMA Mentor Midwives in training-of-trainer activities. The balance of the midwives and the 25 nurses were drawn from health facilities where BAMA has worked to improve the quality of care for the past 10 years.

CONCLUSION

This study of midwives, nurses and community health workers working with a population of young mothers in a rural area of Uganda demonstrated a high level of interest in and enthusiasm for the PrEP ring. The ring was strongly perceived to offer substantial value as an added option given the numerous barriers to access and persistent use of existing PrEP methods for AGYW. Male involvement in promoting the method and supporting partners for its use was seen as critical for success, and the 3 levels of providers all saw themselves as playing a direct, active role in motivating such support and changing attitudes. These results presage a strong potential for uptake and use of the PrEP ring among this population of rural, Ugandan young women at high HIV risk.

Abbreviations

AGYW Adolescent Girls Young Women

BAMA Babies and Mothers Alive Foundation

CHW Community Health Worker

FGD Focus Group Discussion

HCP Health Care Provider

IRB Institutional Review Board

MW midwife

PEPFAR President's Emergency Plan for AIDS Relief

PI Principal Investigator

PrEP Pre-Exposure Prophylaxis

ProPrEP Provider Perspectives of PrEP Ring

SSA Sub Saharan Africa

USAID US Agency for International Development

Declarations

Ethics approval and consent to participate

IRB approval for this study was obtained from Mildmay Uganda Research & Ethics Committee (REC REF 0301-2024), Uganda National Council for Science and Technology (UNC REF HS4468ES), and Pace University IRB (2023-187).

Consent to publish was obtained directly from participants.

Availability of data and materials

A limited dataset for this study is available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

This study was funded by the Jeffrey R Hewitt Foundation Award, Alexander Gralnick Research Award, and Pace University Scholarly Research Grants.

Authors' contributions

ELG, MLC: Conceptualisation, Visualisation, Methodology, Investigation, Data Curation, Data Analysis, Writing - Original Draft, Writing - Review & Editing, Project Administration. **EN:** Visualisation, Methodology, Project Administration, Supervision, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing. **MS:** Conceptualisation, Supervision, Writing – Review & Editing. **DM:** Visualisation, Supervision, Writing - Review & Editing. All authors read and approved the final manuscript.

Acknowledgements

We gratefully acknowledge Elena Finver, MPH for her assistance with article retrieval and manuscript formatting.

References

1. The urgency of now: AIDS at a crossroads. Geneva: UNAIDS: Joint United Nations Programme on HIV/AIDS; 2024.
2. Uganda Population-Based HIV Impact Assessment UPHIA 2020-2021. ICAP [Internet]. 2022 Aug [cited 2026 Jan 19]; Available from: <https://phia.icap.columbia.edu/uganda-summary-sheet-2020-2021/>
3. Nabayinda J, Kizito S, Nagawa A, Ssewamala FM. Reducing HIV in young women in Uganda: the need for autonomy. *The Lancet*. 2024 Aug 10;404(10452):519–20.
4. Seidu AA, Aboagye RG, Okyere J, Agbemavi W, Akpeke M, Budu E, et al. Women's autonomy in household decision-making and safer sex negotiation in sub-Saharan Africa: An analysis of data from 27 Demographic and Health Surveys. *SSM - Population Health*. 2021 Jun;14:100773.
5. Heise L, Greene ME, Oppen N, Stavropoulou M, Harper C, Nascimento M, et al. Gender inequality and restrictive gender norms: framing the challenges to health. *The Lancet* [Internet]. 2019 Jun [cited 2026 Jan 19];393(10189):2440–54. Available from: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(19\)30652-X/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)30652-X/abstract)
6. Murewanhema G, Moyo E, Moyo P, Dzinamarira T. Adolescent girls and young women as a critical population for HIV epidemic control in sub-Saharan Africa: are we doing enough? *Frontiers in Public Health* [Internet]. 2025 Nov 13 [cited 2026 Jan 19];13. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC12657481/>
7. The Dapivirine Vaginal Ring for HIV Prevention – Population Council [Internet]. popcouncil.org. 2023. Available from: <https://popcouncil.org/project/the-dapivirine-vaginal-ring-for-hiv-prevention/>
8. Dapivirine Vaginal Ring 25 mg | European Medicines Agency [Internet]. www.ema.europa.eu. European Medicines Agency; 2025 [cited 2026 Jan 19]. Available from: <https://www.ema.europa.eu/en/opinion-medicine-use-outside-EU/human/dapivirine-vaginal-ring-25-mg>
9. Nel A, van Niekerk N, Van Baelen B, Malherbe M, Mans W, Carter A, et al. Safety, adherence, and HIV-1 seroconversion among women using the dapivirine vaginal ring (DREAM): an open-label, extension study. *The Lancet HIV* [Internet]. 2021 Feb [cited 2026 Jan 19];8(2):e77–86. Available from: https://www.ipmglobal.org/sites/default/files/nel_2021_safety_adherence_and_seroconversion_in_dream.pdf
10. Baeten JM, Palanee-Phillips T, Brown ER, Schwartz K, Soto-Torres LE, Govender V, et al. Use of a vaginal ring containing dapivirine for HIV-1 prevention in women. *The New England Journal of Medicine* [Internet]. 2016 Dec 1 [cited 2026 Jan 19];375(22):2121–32. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4993693/>
11. Nel A, Bekker LG, Bukusi E, Hellström E, Kotze P, Louw C, et al. Safety, acceptability and adherence of Dapivirine vaginal ring in a microbicide clinical trial conducted in multiple countries in Sub-Saharan Africa. *PloS One* [Internet]. 2016 [cited 2026 Jan 19];11(3):e0147743. Available from: <https://pubmed.ncbi.nlm.nih.gov/26963505/>
12. Mavudze J. HIV Sero-Conversions Among Adolescent Girl and Young Female Dapivirine Vaginal Ring (DPV-R) Users: Early Learnings From a Demonstration Project in Zimbabwe [Internet]. *Academic Medical Education*. 2023 [cited 2026 Jan 19]. Available from: <https://academicmedicaleducation.com/materials/hiv-sero-conversions-among-adolescent-girl-and-young-female-dapivirine-vaginal-ring-dpv-r-users-early-learnings-from-a-demonstration-project-in-zimbabwe-17768>
13. Camlin CS, Getahun M, Koss CA, Owino L, Akatukwasa C, Itiakorit H, et al. Providers' attitudes and experiences with pre-exposure prophylaxis implementation in a population-based study in Kenya and Uganda. *AIDS Patient Care and STDs*. 2022 Oct 1;36(10):396–404.

14. Muwonge T, Nsubuga R, Ware NC, Wyatt MA, Pisarski EE, Kamusiime B, et al. Health Care Worker Perspectives of HIV Pre-exposure Prophylaxis Service Delivery in Central Uganda. *Frontiers in Public Health*. 2022 Apr 4;10.
15. O'Malley G, Beima-Sofie K, Roche SD, Rousseau E, Travill D, Omollo V, et al. Health care providers as agents of change: integrating PrEP with other sexual and reproductive health services for adolescent girls and young women. *Frontiers in Reproductive Health*. 2021 May 28;3.
16. Lanham M, Ridgeway K, Mireku M, Nhamo D, Pillay D, Murire M, et al. Health care providers' attitudes toward and experiences delivering oral PrEP to adolescent girls and young women in Kenya, South Africa, and Zimbabwe. *BMC Health Services Research*. 2021 Oct 18;21.
17. Jackson-Gibson M, Ezema AU, Orero W, Were I, Ohiomoba RO, Mbullo PO, et al. Facilitators and barriers to HIV pre-exposure prophylaxis (PrEP) uptake through a community-based intervention strategy among adolescent girls and young women in Seme Sub-County, Kisumu, Kenya. *BMC Public Health*. 2021 Jul 1;21.
18. Hettema A, Shongwe S, Sisel H, Khumalo M, Gama N, Khanyile N, et al. User and healthcare provider early experiences with the PrEP ring: a quantitative study on the introduction of a new PrEP method in Eswatini. *Journal of the International AIDS Society*. 2025 Jul 1;28(S2):e26490–0.
19. Uganda Bureau of Statistics. The National Population and Housing Census 2024 – Final Report - Volume 1 (Main) [Internet]. National Population and Housing Census (NPHC) 2024 Census. Kampala, Uganda; 2024. Available from: <https://www.ubos.org/nphc-2024-census-page/>
20. Uganda Demographic and Health Survey. District Health Information System (DHIS2) data [Internet]. 2024 [cited 2026 Feb 13]. Available from: TBD
21. Mafigiri R, Matovu JKB, Makumbi FE, Ndyababo A, Nabukalu D, Sakor M, et al. HIV prevalence and uptake of HIV/AIDS services among youths (15–24 Years) in fishing and neighboring communities of Kasensero, Rakai District, South Western Uganda. *BMC Public Health*. 2017 Mar 14;17(1).
22. Babies and Mothers Alive Foundation [Internet]. Babies and Mothers Alive. 2025 [cited 2026 Jan 19]. Available from: <https://www.babiesandmothersalive.org/>
23. MOSAIC (Maximizing Options to Advance Informed Choice for HIV Prevention). About the PrEP Ring. Catalyst Study. 2023 Jan 5;
24. PrEPWatch. Catalyst PrEP Ring Factsheet [Internet]. AVAC; 2023 Jan. Available from: <https://www.prepwatch.org/catalyst-study-implementation-materials/>
25. Elo S, Kyngäs H. The Qualitative Content Analysis Process. *Journal of Advanced Nursing*. 2008;62(1):107–15.
26. Creswell JW. Educational research: Planning, conducting, and evaluating quantitative and qualitative research. 4th ed. Boston, MA: Pearson; 2012.
27. Young A, Mancuso N, Atujuna M, Tenza S, Chitukuta M, Kemigisha D, et al. Adolescent Girls and Young Women's Experiences with Disclosing Oral PrEP or Dapivirine Vaginal Ring Use: a Multi-Country Qualitative Analysis. *AIDS and Behavior*. 2023 Jul 1;27(12):3941–51.
28. Taruberekera N, Munjoma M, Mugurungi O, Ncube G, Mutseta M, Dhodho M, et al. A mixed-method study of feasibility and acceptability of the Dapivirine vaginal ring among adolescent girls and young women (AGYW) in selected Zimbabwean districts. Masvawure TB, editor. *PLOS Global Public Health*. 2025 Mar 31;5(3):e0004081.
29. Martin CE, Ramatsoma H, Chidumwa G, Nongena P, Letsielo MJ, Kutwayo A, et al. Uptake of dapivirine vaginal ring and oral pre-exposure prophylaxis among women accessing HIV prevention services in South

Africa: a cohort study. *The Lancet HIV*. 2026 Jan;13(1):e21–9.

30. Heck CJ, Dam A, Yohannes K, Deacon J, Kripke K, Meyers K, et al. Lessons learnt from daily oral PrEP delivery to inform national planning for PrEP ring introduction for women in low-income and middle-income countries: a qualitative inquiry of international stakeholders. *BMJ Global Health*. 2024 May 1;9(5):e014709–9.
31. Montgomery ET, van der Straten A, Chitukuta M, Reddy K, Woeber K, Atujuna M, et al. Acceptability and use of a dapivirine vaginal ring in a phase III trial. *AIDS*. 2017 May 15;31(8):1159–67.
32. Mayo AJ, Browne EN, Montgomery ET, Torjesen K, Palanee-Phillips T, Jeenarain N, et al. Acceptability of the Dapivirine Vaginal Ring for HIV-1 Prevention and Association with Adherence in a Phase III Trial. *AIDS and Behavior*. 2021 Mar 13;25(8):2430–40.
33. Agot K, Onyango J, Perry B, Molokwu N, Taylor J, Ngoje D, et al. How men influence young women taking PrEP: perspectives from young women, male partners, and male peers in Siaya county, Western Kenya. *BMC women's health* [Internet]. 2024 Apr 3 [cited 2024 Jun 30];24(1):218. Available from: <https://pubmed.ncbi.nlm.nih.gov/38570779/>
34. Kusemererwa S, Abaasa A, Kabarambi A, Onyango M, Mugisha JO. Assessment of risk compensation following use of the dapivirine vaginal ring in southwestern Uganda. *Sexually Transmitted Infections*. 2021 Feb 4;98(1):32–7.
35. ICO/IARC Information Centre on HPV and Cancer. Uganda Human Papillomavirus and Related Cancers, Fact Sheet 2023 [Internet]. HPV Information Centre. 2023 [cited 2026 Jan 19]. Available from: https://hvpcentre.net/statistics/reports/UGA_FS.pdf
36. Friedland BA, Browne EN, Roberts ST, Ngure K, Nakalega R, Macdonald P, et al. Higher acceptability of the monthly Dapivirine ring versus daily oral pre-exposure prophylaxis among adolescent girls and young women in Sub-Saharan Africa in the REACH trial. *J Acquir Immune Defic Syndr*. 2025 Dec 15; 100 (5) [cited 2026 Feb 13];415-424. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC12599507/pdf/qai-100-415.pdf>
37. Akyildiz ST, Ahmed KH. An Overview of Qualitative Research and Focus Group Discussion. *International Journal of Academic Research in Education*. 2021 May 7;7(1):1–15.
38. Lobe B, Morgan DL, Hoffman K. A Systematic Comparison of In-Person and Video-Based Online Interviewing. *International Journal of Qualitative Methods*. 2022;21(1).

Footnotes

1. Placebo rings were provided through a Materials Transfer Agreement between Pace University and The Population Council (New York, New York).

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [AdditionalFile1.docx](#)
- [AdditionalFile2.docx](#)