Facilitators and barriers to Pre-Exposure Prophylaxis (PrEP) uptake among adolescent girls and young women in Seme-Sub County, Kisumu, Kenya

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Research Article

Keywords: Adolescent girls and young women, DREAMS Initiative, HIV Pre-Exposure Prophylaxis, Implementation Research, Kenya

Posted Date: December 29th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-124421/v1

Abstract

Background: While the introduction of HIV pre-exposure prophylaxis (PrEP) as an HIV prevention strategy has allowed women to exercise more control over the reduction of HIV transmission rates, adolescent girls and young women (AGYW) in Sub-Saharan Africa continue to experience higher rates of HIV infections and bear the greatest disease burden. Understanding progress in PrEP uptake among AGYW would enhance risk reduction in this vulnerable population. The Determined, Resilient, AIDS-Free, Mentored and Safe women (DREAMS) Initiative plays a key role in this risk reduction strategy.

Methods: We performed a retrospective qualitative study to explore facilitators and barriers to PrEP, specifically those effecting initiation and persistence, among AGYW enrolled in the DREAMS Initiative at Pamoja Community Based Organization (CBO) in Kisumu, Kenya. We conducted key informant interviews (n = 15) with Pamoja CBO staff, health care providers and community leaders. Additionally, we conducted focus group discussions with young women receiving PrEP (n = 40) and peer mentors (n = 12). We did thematic analysis using the Consolidated Framework for Implementation Research to identify emergent themes.

Results: We found that the use of the safe space model, decentralization of PrEP support and delivery, peer mentors, proper linkage to local health care facilities, and the sensitization of parents and male sexual partners were among some of the facilitators to PrEP uptake. Barriers to initiation and persistence included stigma associated with the use of anti-retroviral dugs, distance to safe spaces, and limited testing and qualified health care workers for PrEP distribution and administration.

Conclusions: Overall, community roll out of PrEP within the DREAMS Initiative was successful in part due to integration and layering of services (biological, behavioral and structural), increased self-efficacy among AGYW, enhanced inter-agency and multisectoral collaboration.

Background

Despite global advances in HIV prevention and treatment, Sub-Saharan Africa still bears the greatest disease burden with over 50% of people living with HIV, with women being the most disproportionately impacted because of several factors, including but not limited to biological, social, cultural, behavioral, economic and structural factors (1, 2). In 2018, the UNAIDS Analysis of HIV Prevalence in Kenya reported that women accounted for 65% of people living with HIV in this region, with an incidence more than double among young women (11,000) than young men (5,000)(3). Several interventions including behavior change and condoms, have been applied to help reduce the spread of HIV, especially among adolescent girls and young women (AGYW). These interventions have been shown to be limited in their ability to promote HIV risk reduction because they are dependent on male partner cooperation (4). HIV Pre-Exposure Prophylaxis (PrEP) has been proven to reduce the transmission HIV infection for individuals who are at high risk (5). Unlike these other methods, PrEP represents an effective biomedical HIV prevention method, with a potential of giving women more self-efficacy.

However, despite multiple trials confirming the effectiveness of PrEP, the large-scale rollout of PrEP among women in Sub-Saharan Africa remains a challenge. Identified challenges include poor perception of HIV risk, lack of self-efficacy, suboptimal PrEP awareness among women and men, community stigma, low number of healthcare facilities capable of providing PrEP, insufficient number of qualified healthcare providers, as well as cost and availability of medication (4, 6). Initiatives led by community-based organizations (CBO) can play a significant role in mitigating these barriers by addressing the socioeconomic and health systems barriers while supporting continuous education, awareness campaigns, and distribution of PrEP. In addition, these grassroots organizations can be well equipped to address community and individual challenges to acceptance and adherence (7).

The Determined, Resilient, Empowered, AIDS free, Mentored, and Safe women (DREAMS) Initiative, was designed to reduce the HIV burden and early pregnancies on AGYW between 10 to 24 years of age in Sub-Saharan Africa by 40% in two years (8–10). Funded by the United States Presidential Emergency Plan for AIDS Relief (PEPFAR) and private sector partners, DREAMS consists of biological, structural and behavioral interventions to address risk factors that influence HIV transmission among AGYW. Some of these risks include sub-optimal healthcare access, gender inequality, gender-based violence, poverty, and poor education (2). Combined, these three interventions (biological, behavioral and structural) have shown the potential to significantly reduce HIV incidence amongst AGYW. More broadly, the interventions enhance the capacity of risk reduction for AGYW through social asset building, increases uptake of health services, strengthens participation of families and the community in norms change, and reduce the risk of AGYW male sexual partners (10, 11).

PrEP is one of core intervention of the DREAMS Initiative. Others include post violence care, mixed contraceptive methods, and HIV testing services provision. In areas where the DREAMS Initiative has been implemented, efforts to overcome challenges faced by PrEP implementation strategies have shown some success (12). These gains are attributed to understanding the needs of AGYW in the context of their local community, increased emphasis on AGYW empowerment, and addressing structural barriers.

Pamoja CBO is a grassroot, non-profit organization based in Kisumu County, Kenya. It is a primary implementor of the DREAMS Initiative within the Seme Sub-County of Kisumu County, one of the regions prioritized for PrEP roll-out (13). Pamoja CBO has enrolled approximately 4,831 AGYW in its DREAMS program over the last three years. Out of this, 938 young women have been initiated on PrEP. Pamoja CBO implements PrEP by engaging community and health facility platforms while integrating it into the overall DREAMS empowerment and education package. At the community level, Pamoja organizes sensitization meetings for AGYW perceived to be at risk. These meetings occur at designated safe spaces (girls-only meeting places) where AGYW meet and discuss issues affecting their well-being. These issues include sex and sexuality, reproductive health, and economic empowerment. Meetings are facilitated by trained peer mentors and overseen by expert nurses or clinical officers from government health facilities.

We conducted a retrospective qualitative study to understand the facilitators and barriers to the scale up of PrEP within the DREAMS Initiative at Pamoja CBO in Seme, Kisumu County. Our findings can help

inform similar and new efforts to increase PrEP uptake and persistence among AGYW.

Methods

Study Design:

We conducted a retrospective qualitative study to identify and understand the individual, community and program level factors which facilitated or hindered PrEP uptake and persistence among the AGYW participating in the DREAMS Initiative delivered by Pamoja CBO. We considered PrEP integration into the DREAMS Initiative as the intervention and the main focus of our study.

Study Setting:

The study was conducted in East Seme Ward, Seme Sub-County, in Kisumu County. Seme Sub-County is ranked one of the poorest sub-counties in Kisumu with over 80% of the population unemployed, depending on subsistence agriculture, and 40% living below the poverty line (14). The area is predominantly Luo by ethnicity and borders Lake Victoria, the second largest fresh-water lake in the world (14).

Study Population

During May of 2018, we generated a list of all young women on PrEP from the DREAMS database maintained by Pamoja CBO. We employed purposive sampling procedures to recruit eligible participants including young women (18 to 24 years of age), peer mentors, Pamoja CBO staff members, and associated health care providers and local administrators.

Data Collection

We developed interview guides for key informant interviews (KII) and focus group discussions (FGD) focusing on PrEP integration, delivery strategies, and protocols. We conducted five FGD, each with eight participants (n = 40). Three out of the five FGD only consisted of PrEP beneficiaries, whereas the remaining consisted of peer mentors. We performed 15 KII including Pamoja CBO staff members (n = 5), healthcare providers (n = 5), and administrators (n = 5). Two trained qualitative researchers conducted the interviews in either the local language (Luo) or English. We digitally recorded, transcribed the interviews, and translated them into English when needed.

Analysis

To organize, understand emerging themes, and assess constructs relevant to PrEP implementation under the context of the DREAMS Initiative, we used the Consolidated Framework for Implementation Research (CFIR), a framework designed for systematically assessing facilitators and barriers to implementing evidence based interventions (15). Based on input from the senior authors with experience in implementation and research on PrEP and other HIV interventions, we focused on a) the inner setting, specifically assessing the compatibility and relative priority of PrEP implementation by Pamoja CBO, b)

the intervention characteristics of PrEP and how PrEP was integrated into the DREAMS Initiative c) the outer setting, focusing on the influence of the surrounding health systems and community structures, and d) process, analyzing the execution of PrEP implementation strategy, including engaging key personnel to promote implementation, and continuous evaluation of the DREAMS Initiative and PrEP intervention. During coding, we identified emerging themes using both a priori and grounded theories adding codes as needed.

One author (MJG) coded all of the interviews. A second author, AE, coded three of the initial in order to establish consistency amongst the coders. A third author (PM) reviewed the coding to ensure consistency. We used Atlas.ti, version 8.4.4 (1135) qualitative software for analysis.

Results

Inner Setting (Pamoja CBO) and Intervention Characteristics: PrEP Integration into the DREAMS Initiative by Pamoja CBO

Pamoja staff members acknowledged that AGYW were disproportionately affected by new HIV infections and carried some of the highest risks for disease transmission. They saw the adoption and adaptation of the DREAMS program including PrEP as a key addition to their HIV prevention strategy.

During the initial DREAMS implementation in 2015, Pamoja CBO established safe spaces and engaged peer mentors, local health care providers and government officials. This multi-layered approach, including the involvement of the Ministry of Health was the foundation of the success of PrEP. Pamoja CBO staff and health care providers identified the safe spaces as an important facilitator for PrEP because of the perceived privacy and friendly environment for AGYW to express themselves without fear of discrimination, shame or stigmatization.

“I think that the safe spaces are a brilliant idea because the girls feel safe in the safe spaces. Like in the facility where they might meet some of their relatives from the village and they will shy off from taking their medication. I think that the safe spaces are a nice place for them.” (Pamoja CBO Staff)

As observed by health care providers and Pamoja CBO staff members, peer mentors were also essential to the success of PrEP implementation. They kept safe-spaces active, ensured continuous education, liaised with service providers to ensure beneficiaries received different services at the safe space. Mentors also ensured that AGYW honored their clinic appointments, traced defaulters and linked them back to services. We observed that without peer mentors, enrollment and retention of young women on PrEP would have been difficult.

“Mentors are the backbone of the DREAMS program. Without them, I think we would not be anywhere near where we are because they are the people who are on the ground and talk to the ladies, talk to the parents, talk to the healthcare community.. .Without them, there wouldn’t be people to help organize the safe spaces, where we meet.. .. They are the people who pass the messages to the girls, even those who

are in school that cannot pick up their drugs. They are the people who tell them. . .reminds them of their TCAs." (Healthcare Provider)

AGYW noted that continuous education given in the safe space as a part of the PrEP implementation strategy was beneficial. They remarked on how knowledge surrounding PrEP increased their confidence in remaining on the medication and continuously reinforced their reasoning for taking it. Participants were aware that PrEP was not a lifelong intervention, accepting that it was an effective temporary measure as they worked to reduce their overall HIV risk by engaging in the other DREAMS interventions.

"Yeah, one leaves because she has seen risks are no more or have reduced. This is because we were taught that PrEP isn't something you take the whole of your life." (FGD Participant)

Male sexual partner(s) and parental education was an essential step to the implementation strategy as it promoted persistence and retention to PrEP. Both the key informants and DREAMS beneficiaries highlighted the importance of educating partners and parents, emphasizing how this helped to facilitate disclosure and understanding.

"But, we faced this challenge and took initiative of educating the male sexual partners. Now, they also have information about PrEP. They have knowledge about PrEP, so it's even easier to give information to their wives. If the wife say 'I'm now using PrEP' it because the husband already has the information." (Pamoja CBO Staff)

Participants identified timely disclosure of PrEP use to family members as another facilitating factor for PrEP initiation and persistence. They agreed that disclosure to family members and partners was essential to ensure retention, clinic follow up appointments and adherence to medication.

"Disclosing is good.. .there is this time a parent bumped into me along the road and he asked me, 'the drugs that you wrote for my daughter, PrEP, when is the next refill date because my child is already in school, I thought I would pick it for her and take to her. I was surprised because I didn't know she had already disclosed…so apparently they are free with each other back at home and that made me happy." (FGD Participant)

Outer Setting: The influences of the AGYW, community, health systems.

In addition to their awareness of HIV risk factors and knowledge about the purpose and benefits of PrEP, we found that AGYW decisions to enroll in PrEP were influenced by community, structural and individual related factors. For example, young women said personal experiences with peers and community members determined whether or not one would enroll and stay on PrEP. Participants also identified other cultural and socioeconomic factors (poverty and financial instability, polygamous marriages, multiple sexual partners) as major barriers.

"What do I say? For me the reason why I started using PrEP is that I am in a polygamous marriage and you cannot know how the other person is same to the man, so even if he decides to have as many

women as he wants, I am safe." (FGD Participant)

Inadequate financial support was identified as a driver for unsafe sexual practices and transactional sex by most AGYW. Specifically, financial insecurity was acknowledged by the AGYW as one of the reasons why they continue to seek out PrEP while using other DREAMS interventions to reduce their chances of becoming infected with HIV. Some AGYW commented on their peers using sex in exchange for commodities and services.

"But you know the main reason why women get into other relationships outside marriages lack of money. Also, if that's a school going child, she will get into such relationships because she has needs that aren't being met. She needs pads, pocket money and yet when she asks the mother, she is told that during her days she used to use blankets as a substitute for pads. So, when she finds one who can do all those things for her, she will definitely be influenced." (FGD Participant)

Process: Prep Implementation And Program Evaluation

The Pamoja CBO staff recognized that community structures and linkages were critical and their approach to identifying and engaging key opinion leaders was essential to successful PrEP rollout.

"So, we go through chiefs, the administrators, the village elders, we call them for a meeting and tell them that we want to do um, a pilot. .. And then we talk to them and explain to them what it's all about. Then, they link us to the community and then we also have a meeting with the larger community like a baraza and then we talk to them about the program and what it wants to deal with and we ask for their cooperation. Then after that, we get into the community." (Pamoja CBO Staff)

The implementation of the biomedical services offered by Pamoja CBO (PrEP, HIV testing, contraceptives, post violence care) are done in collaboration with the Ministry of Health. Without the assistance of the Ministry of Health and continuous data tracking, the rollout would not have been as successful.

"We report every month to [a donor agency] and also to the Ministry of Health. Yeah, because they want to see the trend of PrEP and how it is going up or going down. But at the moment it is going up, which is a good thing. We still need more girls to embrace PrEP because in DREAMS, [PrEP is] our main objective is prevention." (Pamoja CBO Staff)

Challenges To Prep Implementation

Despite the successful integration of PrEP into the DREAMS Initiative at Pamoja CBO, it has been faced with several challenges that span multiple constructs in the CFIR framework. Some of the biggest barriers that affect PrEP initiation and persistence were found in the constructs within intervention characteristics and the outer setting. These included perceived medication side effects, community stigma against PrEP, frequent relocation of AGYW, and limited human and financial resources to supports scale-up of PrEP distribution.

Known side effects of the medication remains a concern among the beneficiaries. Although most participants reported good persistence, some worried about the resulting side effects of the drug. Some complained about poor appetite, dizziness, nausea, vomiting, and stomachaches. These beliefs surrounding drug side effects contributed poor PrEP adherence and retention to PrEP.

"What I would say about challenges is the side effects- as one of the people who are on PrEP, the challenge that comes with it is the side effects-because after taking this drug, you may feel sickly in the morning hours and that would make a parent be concerned and want to know why that's the case…." (FGD Participant)

Despite continued community engagement and education, stigma remains a barrier to successful PrEP implementation among AGYW. Most beneficiaries reported that the stigma against anti-retroviral therapy (ART) in the community is transferred onto PrEP in part due to similar pill appearance and packaging. Respondents also noted attitudes that PrEP use is associated with increased promiscuity, commercial sex workers, and people who are infected with HIV.

"Some of my peers say that I'm a prostitute though for me I know I'm not. I use PrEP so

that I prevent HIV infection while others say I pretend to be taking PrEP while I am on ARVs even so this didn't worry me because I never used to ask anyone so no one knows my thoughts." (FGD Participant)

Service providers observed that the frequency of AGYW relocation due to schooling or marriage was a barrier to PrEP persistence and engagement in the DREAMS program overall. AGYW who relocated were more vulnerable to losing consistent access to PrEP, leading to defaulting. Most beneficiaries vocalized the same thoughts and admitted that in some occasions, these relocations happened without Pamoja staff members or healthcare providers knowing.

"What I think that can make someone to stop using PrEP, is when a woman changes residence, especially in places where access to hospital and PrEP in particular may be a challenge, then I can stop it because returning here frequently will be difficult. It will force me to withdraw because in my new location there is no way out and here, I may not return faster to get PrEP". (FGD Participant).

The insufficient number of healthcare providers qualified to offer PrEP continues to be a challenge in the current PrEP implementation strategy, making PrEP initiation and persistence more difficult. Barriers to providing PrEP to AGYW included low clinic staffing and lack of transport available to reach the safe spaces and community events.

"Staffing is an issue 'cause at times you like want to you, but you are alone here [at clinic]. So, you are left with your hands tied. So, as much as you really want to go to that baraza or chief camp to maybe enlighten them on PrEP, you find yourself here at the facility. So maybe I can say staffing issue is a challenge" (Healthcare Provider)

Limited financial resources at health care facilities has also made the initial initiation and clinical monitoring of PrEP and its side effects difficult. This included either inability or delays in required laboratory tests, resulting in skipping the tests to avoid slow in PrEP initiation.

“There are times where funds are limited and to order pertinent lab tests such as liver

function tests and creatinine clearance. This is a detriment to the delivery of PrEP, because the inability to adequately screen for health problems or detect potential complications caused by PrEP may delay the initiation and continued administration of the drug to certain individuals.” (Healthcare Provider)

Discussion

Using CFIR, we identified key facilitators and barriers to successful PrEP implementation and integration into the DREAMS Initiative adopted by Pamoja CBO which spanned multiple CFIR constructs. Critically important was the influence of community attitudes on PrEP uptake and the importance of the health system to support this work to reduce ongoing HIV infections among this vulnerable population. Other facilitating factors included collaborative partnerships between Pamoja associated partners, the use of safe spaces and peer mentors, the development of educational sessions for AGYW male sexual partners and parents, and the consistent data tracking for PrEP enrollment and at high risk individuals. We also identified challenges to PrEP implementation to be associated with structural challenges such as poverty, PrEP associated stigma and the limited availability of personnel and clinical resources to support the upscaling of PrEP.

The partnerships between Pamoja CBO and key local community, health sector and government entities proved to be key for successful PrEP implementation. This was similar to the findings by Chimbindi et. al, who published a study on the implementation of the DREAMS Initiative in South Africa (12). This study showed that multi-sectoral collaborations in addition to strengthening existing resources and policies promoted the rapid expansion of the DREAMS Initiative, contributing to PrEP uptake (12, 16). The authors argue that the core tenants for successful adoption and early expansion of PrEP include key stakeholder consultations and engagement, favorable legal environment for key populations, existing PrEP treatment guidelines, HIV service provider training, existing drug procurement system, innovative demand creation activities, multiple service delivery models, and government’s active ownership, which is consistent with our findings (13, 16).

We found the process of monitoring of PrEP implementation within the context of the DREAMS Initiative as an additional facilitating factor to PrEP uptake and persistence. Pamoja CBO has adopted a strong data collection protocol and compiles it into a country wide monitoring and evaluation database. The development of these databases has allowed for more granular analysis of PrEP initiation and adherence across all DREAMS affiliated sites and can better assess PrEP success. The value of having an monitoring and evaluation database for DREAMS program tracking is not unique to our study, but has been cited previously (12). We argue that the continued data collection and tracking will facilitate a more robust PrEP scale-up as more beneficiaries will be tracked more consistently over a longer period of time.

The study revealed that the preparation to support PrEP as an intervention required the establishment of secure safe spaces for the AGYW. It became evident that safe spaces provided safe havens for young women to openly discuss issues around sex and sexuality, empowering them to take action regarding important decisions on their health. It is well known that the safe space model has been incredibly useful in promoting community-based initiatives. They build social capital and have been shown to increase agency among AGYW(10). The positive culture cultivated within safe spaces encourages better PrEP persistence and diminishes other HIV risk factors. Safe spaces are considered to be effective because of their ability to continuously promote risk reduction strategies while creating a supportive environment. Furthermore, they mitigate the effect of “present-bias”, where young women focus on the immediate rewards or costs at the expense of their long term goals and objectives (17, 18). Safe spaces allow AGYW to routinely re-evaluate their risk-benefit of taking PrEP. Additionally, safe spaces allowed Pamoja CBO to decentralize the provision of PrEP away from the county hospitals and clinics, increasing drug accessibility to DREAMS beneficiaries. This provided a more woman-centered approach to PrEP delivery, eliminating many of the barriers associated with time and distance of drug procurement.

We were also able to identify factors associated not just with uptake but PrEP persistence. Participants reported that in addition to safe spaces, peer mentors were important to effectively boosting PrEP initiation, persistence, and close follow up. These findings are similar to the role of peer mentors in HIV care and treatment programs and is now being adopted into PrEP initiatives (19). Peer mentors are a valuable resource because they are able to assume some of the responsibility that would otherwise be that of already over-worked health care professionals in resource challenged settings. The PrEP Chicago study performed by Young et al. is a demonstration of how the positive impact that social networks and peer mentors have on promoting PrEP uptake and persistence in addition to empowering others to take charge of their sexual health (19). Even though there has been little evidence on the role of mentors on behavior change, the Health Belief Model suggests that individual networks of people are influential on how people change their behaviors (20). Building social networks allows for the filling of informational gaps left by healthcare providers, increasing trust of PrEP and reducing PrEP related stigma. In the case of PrEP as part of the DREAMS Initiative, we acknowledge that mentor involvement will remain relevant to monitor retention and persistence. In addition, we posit that, as PrEP beneficiaries are graduated out of the program, they will need peer mentors to help them navigate from risky behaviors.

We also found that disclosure of PrEP by the AGYW to their parents and male sexual partners promoted persistence to the once daily pill regimen. This is consistent with the existing literature assessing the importance of disclosure on persistence and adherence. Although it can initially lead to stigmatizing experiences, disclosure to male sexual partners and parents has been described as an empowering way to combat community stigma against PrEP (21, 22). Additionally, disclosure has been found to improve a young woman’s ability to take the medication and encourage at risk peers to initiate preventative treatment. A study conducted by Velloza et al., further argues that PrEP programs, such as the DREAMS Initiative can foster community and clinic-based discussion, adherence clubs and normalizing sexual behavior and PrEP use (23). Unlike previous investigations, our study explores the value of PrEP education sessions for male sexual partners and parents of at risk AGYW and how this can positively

impact PrEP uptake and decrease PrEP associated stigma. No studies have been performed assessing the overall benefit of PrEP education sessions for the individuals who are closely connected to AGYW and potentially highly influential to their continuation of PrEP treatment. Further exploration of educational programs targeting these individuals could potentially highlight how male sexual partner and parent involvement can reduce PrEP associated stigma.

Inadequate clinical resources and staffing was one of the challenges to PrEP implementation. In an environment that already suffers from staff shortages and limited clinic equipment, the incorporation of PrEP as an additional clinic service, which included the important outreach work, was reported as a challenge by study participants. These providers, who are already responsible for HIV care and treatment, are some of the most over-burdened workers in the Kenyan healthcare system and their growing clinic responsibilities in combination with limited additional support has put strain on the scale-up of PrEP (24). Our interviews revealed that a large number of the defaulters in the PrEP program was in part a result of the shortage of personnel qualified to administer PrEP and an inadequate amount of clinical resources for routine screening and monitoring. We believe that these are emerging problems that will continue to worsen during future PrEP scale-up, which is a similar argument made in other studies. These challenges are similar to those that came about with early implementation of anti-retroviral therapy (ART), which were resolved by calculating the staffing needs to ART provision and creating a more efficient work flow environment in the clinics (25–27). A similar strategical approach should be taken when thinking about PrEP scale up. Our study suggests that an increase in personnel would help to offload the increased time demand for the current PrEP providers. This would require increased resource allocation from the Kenyan Ministry of Health.

Not surprisingly, PrEP stigma, the existing poverty and financial insecurity of the AGYW and community members living in Seme sub-county were also challenges. Despite the work to reduce this barrier, some PrEP stigma remained was closely linked to associations of the medications with HIV infections, anti-retroviral therapy, as well as with associations with increased promiscuity (28, 29). Published literature has sought out to qualify the type of stigma surrounding PrEP and devise strategies to counteract it. For instance, continued education and positive marketing about PrEP have been the most effective strategies in stigma reduction so far (28, 30) .

Our study has a number of limitations. We only interviewed young women on PrEP and therefore did not have the opportunity to explore barriers for women who did not choose to start or stopped PrEP. Having this information could have given us more insight about the challenges preventing PrEP uptake among AGYW. Additionally, we did not speak to any healthcare workers who refused to administer PrEP. This could have uncovered healthcare worker stigma and other provider related biases influencing PrEP uptake. Since our study was strictly qualitative, we were unable to quantitatively assess the rates of DREAMS beneficiaries who enrolled and subsequently defaulted from the program. Like all retrospective studies, responses relied on recall and could have been biased due to social desirability. Finally, only individuals willing to participate were included which could also have introduced bias.

Conclusion

The model of multidimensional and integrated strategies addressing system and individual barriers to HIV prevention methods crossing socioeconomic, cultural and structural domains while simultaneously enhancing access to and support for key biomedical interventions, such as PrEP, are key for decreasing the incidence rates of HIV among AGYW in Kenya and other populations. The implementation of this model with strong community engagement and linkage offers important lessons for how the DREAMS Initiative can be transferred to other settings, working to reverse the trends of ongoing HIV transmission among AGYW.

List Of Abbreviations

AGYW: Adolescent girls and young women

ART: Anti-retroviral therapy

CBO: Community Based Organization

CFIR: The Consolidated Framework for Implementation Research

DREAMS: Determined Resilient, Empowered, AIDS-free, Mentored, and Safe women

FGD: Focus group discussions

HIV: Human immunodeficiency virus

KII: Key informant interviews

PEPFAR*:* President's Emergency Fund for AIDS Relief

PrEP: Pre-exposure Prophylaxis

Declarations

Ethics approval and consent to participate:

The study protocol was approved by the following IRBs, Northwestern University (STU00207400.) and the African Medical Research Foundation (AMREF) (P470/2018).

Written informed consent was obtained from all participants. Participants received approximately $10 to compensate for their time. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for Publication:

Not Applicable

Availability of Data and Materials:

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. Please contact the corresponding author, Maya Jackson-Gibson (maya.jackson-gibson@northwestern.edu), for any requests for data access.

Competing interests:

The authors declare they have no competing interests.

Funding:

Funding from Institute for Global Health at Feinberg School of Medicine at Northwestern University.

Author's Contributions:

MJG conducted and transcribed key informant interviews. She coded all of the focus group discussions and key informant interviews based on emerging themes. MJG was a major contributor in writing the manuscript. AUE coded key informant interviews. WO and IR were both responsible for organizing key informant interviews and focus group discussions, read and reviewed the manuscript. LRH and POM were responsible synthesizing emerging themes and categorizing them based on the CFIR framework and were also significant contributors to writing the manuscript. ROO provided edits throughout the manuscript writing process. All authors read and approved the final manuscript.

Acknowledgments:

The authors would like to thank all of the Pamoja staff members, DREAMS beneficiaries, Ministry of Health, Seme Sub-County, and village leaders who helped make this study a possibility. We would also like to acknowledge Winny Ochieng who assisted in data collection. We appreciate the discussion with Leah Neubauer, EdD, MA for her guidance with manuscript revision and editing. Lastly, we would like to thank Sera Young, MA, PhD for her oversight of this project.

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