# Empowerment, Stigma, and Structural Factors and their Influences on Sexual and Reproductive Health Care of Young Women

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**Abstract**

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Adolescent girls and young women (AGYW) in East and southern Africa face parallel epidemics of HIV incidence and unintended pregnancy. AGYW in Kenya, specifically, confront unique challenges to sexual and reproductive health access, quality, and wellbeing. To understand the social and structural barriers that impede optimal reproductive health outcomes, it is crucial to understand the experiences of stigma, empowerment, and health system structural factors and how they affect sexual and reproductive health care among AGYW in Kenya.

First, we describe HIV pre-exposure prophylaxis (PrEP) metrics among AGYW (ages 15-30) in post-abortion care (PAC) clinics in an implementation-science study delivering PrEP in 14 PAC clinics (n=6788 women), and evaluate associations between structural factors and facility-level PrEP offers and uptake to identify the prominent gaps where health systems can improve. Among a subset of AGYW in PAC settings that were enrolled into research (N=401), we quantitatively measure PrEP and abortion stigma and assess the effects of stigma on PrEP use and family planning (FP). Lastly, we evaluate the factor structure and internal consistency of an adapted scale to measure sexual and reproductive health empowerment among AGYW (ages 15-20) utilizing data from a cross-sectional cohort in Kenya (n=500), and assess the relationship between empowerment scores and ability to prevent undesired pregnancy to gauge construct validity.

We demonstrated that several health systems factors, including PrEP and HIV testing commodities supplies, type of clinic (private vs. public), and proportion of PAC providers that are trained in delivering PrEP, are significantly associated with both PrEP offers and uptake at the facility level. Among 401 AGYW initiating PrEP through their PAC provider, 120 (29.9%) initiated highly effective FP. We found a high burden of abortion stigma among AGYW, and the higher scores in the subdomain of isolation were significantly associated with greater likelihood of initiating a highly effective FP product, while the higher scores in the subdomain of community condemnation were significantly associated with reduction in the likelihood of initiating a highly effective FP product after an abortion. Among 114 (28.4%) AGYW returning for their month 1 follow-up visit, 95 (78.5%) women reported continuing PrEP and 60 (50.0%) were adherent to PrEP, as detected via urine assay. In this subset, higher levels of PrEP stigma were significantly associated with greater likelihood of PrEP adherence, and there was no statistical association with self-reported PrEP continuation. Lastly, the 26-item adapted sexual and reproductive health empowerment scale had acceptable fit, as all subscales had Cronbach's alpha scores >0.7, and all items had rotated factor loadings >0.5, indicating good internal consistency and robust factor-variable associations. Total empowerment score was significantly associated with an increased odds of consistent method use (no episodes of sex when method was not used) in past 3 months.

Together, the results presented in this dissertation provide insights into the design of effective reproductive health programs that address the unique structural and psychosocial challenges faced by young women in Kenya, namely investing in health systems to stabilize the environment for delivering PrEP, integrating stigma-informed methods to counsel young women to choose optimal FP and PrEP decisions, and utilizing an adapted measure of empowerment to tailor research efforts and measure success. This work contributes to efforts for centering the needs and improving experiences of young women's in sexual and reproductive health care.

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**Dedication**

*To the women who shaped me.*
Ladan Zolfaghari, my maman. Azeen Zia Ebrahimi, my sister. Ghodsi Nadali, my grandmother. Boshra Aghasian, my great-grandmother.

*For women, life, freedom.*
برای زن، زندگی، آزادی

# Chapter 1. Introduction

*Sexual and reproductive health is a human right.* According to the United Nations, sexual and reproductive health rights include "the right to life, liberty and the security of the person; the right to health care and information; and the right to non-discrimination in the allocation of resources to health services and in their availability and accessibility"[1]. Sexual and reproductive health rights are inclusive of people of all genders, sexual identities, and ages, and are particularly salient for adolescents given their developing sexual autonomy. Adolescent girls and young women (AGYW) often face difficult challenges navigating their sexual autonomy given age-specific vulnerabilities, a lack of agency or experience in negotiating sexual acts, heightened awareness of social stigma pertaining to gender norms and AGYW's societal status, economic disempowerment sometimes leading to transactional sex, and difficulty accessing sexual health information and services[2–8]. To center and empower young people to make informed decisions about their health, policies and normative guidance must be tailored to provide them with access to evidence-based sexual and reproductive health information and services.

*Suboptimal reproductive health outcomes among young women in Kenya point to key opportunities to equitably consider their needs in health programs.* In Kenya, young women are disproportionately affected by HIV, with incidence rates more than twice that of their male counterparts. In implementation settings, approximately 20% of women who are screened for HIV status and behavioral risk go on to initiate HIV pre-exposure prophlyaxis (PrEP)[9,10]. In addition to an unmet need for HIV prevention, Kenyan women who intend to avoid pregnancy have an unmet need for contraception and young women between 15-19 years old account for the highest unmet need, with 42% of sexually active AGYW not using any method[11]. In Kenya, half of all pregnancies are unintended[12], and young women under age 25 comprise of 49% of abortion clients[13]. To better address these sexual health inequities, we seek a deeper understanding of the experiences of young women and the factors that influence their use of sexual health services, such as contraception and PrEP.

*Development in adolescence and youth is a pivotal time period wherein sexual autonomy and power is challenged through social norms and expectations from parents, partners, and peers.* Gender and power dynamics drive disparities in accessing PrEP[14] or family planning[15], and thereby are determinants of health for adolescent girls and young women. These power imblances often play out in relationships with older partners that may lead to inability to negotiate condom use or exercise agency over childbearing timing relative to educational or personal goals[16,17]. Furthermore, the context in which young women make sexual health decisions is often ridden with overlapping considerations about stigma around medical mistrust, promiscuity, and youth and female autonomy[18–24]. A recent population indicator of bodily autonomy estimated that <60% of women aged 15-49 years in Kenya are able to make autonomous decisions when it comes to declining sex, using contraceptives, or using other health care services[25]. To better close gaps in power disparities, we need better understanding of the social and structural contexts that adolescent and young people navigate and the opportunities through these contexts that we can improve program delivery and scale up services to foster autonomy and power.

*Stigma, empowerment, and features of the health system are interconnected through the social and material conditions that impact reproductive health care and decision-making*, including contraception, abortion, and HIV prevention. Stigma, whether self-imposed or external or perceived or experienced, can create feelings of shame and fear which may prevent individuals from seeking out, accepting, and accessing needed services[26]. Empowerment, on the other hand, supports individuals to have agency and the resources to make informed decisions about themselves and in spaces where that ability was previously denied to them[27]. Health system factors, such as difficult experiences with medical providers, long clinic wait times, and instable commodities supply can also create barriers to accessing health services[28–30].

*To understand the social and structural barriers that impede optimal reproductive health outcomes,* it is crucial to understand the experiences of stigma, empowerment, and health system structural factors and how they affect sexual and reproductive health care among young women

in Kenya. We explore these factors in-depth through analyses of their effects on the uptake and continuation of reproductive health services, including PrEP and family planning. These analyses comprehensively introduce areas that can be addressed to improve sexual and reproductive health services for young women. By evaluating the complexity of these relationships, we provide insights into the design of effective reproductive health programs that address the unique challenges faced by young women in Kenya.

**Positionality**

As a global health researcher, I recognize that scope of my work takes place in countries in which my lived experience is minimal, namely Kenya. My commitments to decolonization are visible through actions 1) that demonstrate esteem for my Kenyan colleagues and mentors and 2) that structure our analytical lenses with frameworks that center the culture, community, and participants with dignity and respect. Given that our work is focused on sexual and reproductive health, conducting conscientious research requires consideration of human rights, the systems that shape health decisions, and the social forces that surround young women's sexuality and health. Situating our analytical lens does not fully capture the lived experience of young women accessing reproductive health services. Reproductive justice[31], a framework conceived by Black women in the US South as part of the SisterSong, is foundational to my understanding, passion, and purpose as a reproductive health researcher. Reproductive justice is defined as "the human right to maintain personal bodily autonomy, have children, not have children, and parent the children we have in safe and sustainable communities." Centering the experience, priorities, and activism of Black and African women in the foreground, reproductive justice and equity shape both my praxis and scholarship.

# Chapter 2: Structural Influences on Delivery and Use of Oral HIV PrEP among Adolescent Girls and Young Women Seeking Post Abortion Care in Kenya: An Implementation Science-Driven Cross-Sectional Study

***Do structural factors effect PrEP care among young women?***

Much of our understanding of PrEP use among adolescent girls and young women stem from clinical trials and observational research studies that may not reflect real world conditions and may achieve greater levels of PrEP initiation and retention. In real world settings, structural issues become more salient to AGYW navigating healthcare systems, including long wait times and non-private clinic spaces, and receiving counseling to inform their PrEP use. Contextualizing the experiences of structural and health systems dynamics of PrEP care, Chapter 2 contributes to a larger understanding of PrEP delivery for young women in reproductive health settings, specifically in post-abortion care.

In this chapter, we consider the larger scope of health systems delivering PrEP care to adolescent girls and young women. An implementation science-driven project, entitled PrEP Delivery in Reproductive Health for AGYW, phase 2 (PrEDIRA 2), launched delivery of PrEP in post-abortion care clinics in Kisumu, Nairobi, and Thika, Kenya to evaluate uptake and feasibility. Drawing upon upon constructs from the Consolidated Framework for Implementation Research, we identified domains of structural factors that likely influence the program's delivery of PrEP[32,33]. As part of this work, we describe PrEP metrics among young women (ages 15-30) in post-abortion care clinics, for the first time in Africa. We also evaluate associations between structural factors and facility-level PrEP offers and uptake to identify the prominent features impacting these outcomes and gaps where health systems can improve.

## Chapter 3: The Effect of Stigma on Reproductive Health Decisions of Young Women Accessing Post-Abortion Care in Kenya: A Cohort-Study

***What is the burden of stigma reported by young women seeking care in post-abortion clinics?***

Socialization is a central process of adolescence and young adulthood, where social norms are internalized, challenged, and adopted. Through this process, social and gender norms provide expectations that lay a foundation for how AGYW view themselves and significantly influence their life choices[34]. Gender and social norms can be experienced and internalized as stigma which then denies AGYW the self-efficacy to make decisions around their SRH choices, whether accessing contraceptives, abortion, or PrEP services[34]. The defining feature of stigma involves a level of discrimination that denies individuals full social acceptance and thereby drives social and health inequities[35,36]. The complexity of stigma experiences of AGYW in abortion settings, in particular, is an insufficiently studied area of research and is an inherently important consideration of sexual health decision-making.

In Chapter 3, we quantitatively measure levels of stigma and assess the effect of stigma on contraceptive initiation and PrEP use among young women (ages 15-30) receiving post-abortion care. We captured experiences of PrEP stigma and abortion stigma through two quantitative scales and we evaluate their effects on PrEP use and FP initiation, respectively. Few validated measures of PrEP stigma exist for communities in Africa, and we found that PrEP stigma was common and had a potential positive association with adherence to daily oral PrEP, but it was not associated with PrEP continuation after the first month of PrEP use. Abortion stigma was also common, with experiences of community condemnation capturing the domain with the highest stigma scores (4.5 out of 5). Highly effective FP initiation subsequent to an abortion was uncommon (30%), and was more frequent among young women with high scores in subdomain

of isolation and less frequent among high scores of community condemnation. This is the first study to assess the coinciding stigmas that young women experience at the intersection of HIV prevention and abortion care, and these findings highlight the importance of identifying opportunities to reduce stigma and diminish its effect on young women.

## Chapter 4: Confirmatory factor analysis and validation of the Sexual and Reproductive Empowerment Scale for Adolescents and Young Adults in Kenya

### *Does sexual and reproductive empowerment increase contraceptive use?*

Empowerment is a multidimensional and multilevel process, fluctuating both over time and in relation to individual, interpersonal, and social forces, and a culturally specific concept with respect to norms around gender and sexuality[37,38]. Sexual and reproductive empowerment is both a process and an outcome, with women as active agents and not recipients of change[37–39]. Sexual and reproductive empowerment among women has been established as distinct components of overall empowerment[37]. While empowerment is context specific, in both place and time, there remains a gap in knowledge regarding the adaptation of women's empowerment scales for use in additional different regions, among more disempowered parts of society[37]. Adapting and validating the quantitative tool for use in the Kenyan setting is critical in order to encompass the domains of empowerment that are relevant for shaping sexual and reproductive decision-making and care of AGYW in Kenya.

In Chapter 4, we conducted psychometric analyses to assess the factor structure of a sexual and reproductive empowerment scale adapted to the Kenyan setting (SRE-K), grounded in the theoretical and qualitative work, among adolescent girls and young women (aged 15-20 years) who were enrolled into the EMpowering Adolescent Reproductive health choice and Access (MARA) cohort in Kisumu, Kenya. We found high internal consistency and robust factor-

variable associations, while the correlation matrix suggested multidimensionality of the latent domains of sexual and reproductive empowerment. We also estimated construct validity of this measure by evaluating the association between SRH empowerment scores and consistent contraceptive use among adolescent girls and young women who desire to avoid pregnancy. Supporting this validity, the SRE-K score was associated with an increase in consistent use of contraception.

**Summary**

This dissertation links the experiences of Kenyan AGYW with myriad health system-level features, layered stigma, and multidimensional empowerment as part of the complex ecosystem that they navigate to make decisions about their sexual and reproductive health care. Our work provides evidence of the system- and clinic-level factors that effect the environment and success of PrEP delivery for young women, describes the levels of PrEP and abortion stigma experienced and their potential consequences on PrEP and FP use among young women in these settings, and highlights the Kenya-specific domains of adolescent sexual and reproductive empowerment and their effect on contraceptive use. Together, these results emphasize the imperative to center adolescent girls and young women within the healthcare system and to adjust service delivery in ways that incorporate stigma-reducing and empowering messaging to meet their needs.

# Chapter 2. Structural Influences on Delivery and Use of Oral HIV PrEP among Adolescent Girls and Young Women Seeking Post Abortion Care in Kenya

**Structural Influences on Delivery and Use of Oral HIV PrEP among Adolescent Girls and Young Women Seeking Post Abortion Care in Kenya: An Implementation Science-Driven Cross-Sectional Study**

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## ABSTRACT

### Background
Adolescent girls and young women (AGYW) in East and southern Africa experience a disproportionate burden of HIV incidence. Integrating HIV pre-exposure prophylaxis (PrEP) within existing programs is a key component of addressing this disparity.

### Methods
We evaluated an oral PrEP program integrated into post-abortion care (PAC) in Kenya from March 2021 to November 2022. Technical advisors trained staff at PAC clinics on PrEP delivery, abstracted program data from each clinic, and collected data on structural characteristics. Utilizing a modified Poisson regression, we estimated the effect of structural factors on the probability of PrEP offer and uptake, defined as dispensing of initial PrEP bottle.

### Findings
We abstracted data on 6877 AGYW, aged 15-30 years, across 14 PAC clinics. PrEP offers were made to 57.4% of PAC clients and 14.1% initiated PrEP. Offers were more common at clinics that had consistent supply of PrEP (relative risk (RR): 1.81, 95% confidence interval (CI): 1.1-2.95), inconsistent HIV testing commodities (RR: 1.89, 95% CI: 1.26-2.78), had all providers trained (RR: 1.65, 95% CI: 1.01, 2.68), and were public (RR: 1.89, 95% CI: 1.26-2.78). These same factors were associated with PrEP uptake: consistent supply of PrEP (RR: 2.71, 95% CI: 1.44-5.09), inconsistent HIV testing commodities (RR: 2.55, 95% CI: 1.39-4.67), all providers trained (RR: 2.61, 95% CI: 1.38-4.92), and were public (RR: 2.55, 95% CI: 1.39-4.67).

### Interpretation
Greater success with integration of HIV prevention into reproductive health services will likely require investments in systems, such as human resources and PrEP and HIV testing commodities, to create stable availability and ensure consistent access.

**INTRODUCTION**

Adolescent girls and young women (AGYW) ages 15-24 years in East and southern Africa bear a disproportionate burden of new HIV infections, demonstrating unmet need for HIV prevention. Recent estimates show that 63% of new HIV infections in East and southern Africa are among women and 25% are among AGYW[40]. In Kenya, AGYW have a 2.2-fold higher HIV incidence than their male age counterparts and represent one-third of new infections annually[41,42]. National scale-up of oral HIV pre-exposure prophylaxis (PrEP) in Kenya was launched in 2017[43]. As an additional measure to combat HIV for AGYW, novel programs are integrating oral PrEP into existing health services, including those for reproductive health (e.g., family planning, maternal and child healthcare). A recent study estimated moderate levels of PrEP uptake, 22%, among Kenyan AGYW when PrEP is offered through family planning programs and high levels when the woman knows that her partner is living with HIV[44,45].

In addition to the HIV epidemic, young women in Kenya face an epidemic of unintended pregnancy, and ≥40% of unintended pregnancies end with an early termination through clinics providing post-abortion care (PAC)[46,47]. A cross-sectional survey of AGYW in Western Kenya engaged in casual or transactional sex indicated that 21% had a previous abortion[48]. PAC settings provide a set of core interventions for essential reproductive health care, including emergency treatment for incomplete abortions, family planning, and sexual health counseling[49]. AGYW comprise of nearly half of all clients seeking PAC in Kenya[47]. For AGYW receiving PAC, risk for subsequent condomless sex and pregnancy remains high and may be coupled by risk for HIV and other sexually transmitted infections. In a recent pilot study among 200 Kenyan AGYW accessing services for PAC, the prevalence of *Chlamydia trachomatis* was 18%, 99.5% reported not knowing their partners' HIV status(es), and 95.7% reported not using a condom with sex during the past month[50]. There was also a high interest in PrEP (46.4%) and one-third received a referral suggesting that PAC settings could be a fruitful entry point for integrating PrEP care for

AGYW. Thus, PAC is an as-yet underutilized setting for the integration of PrEP and has potential to serve an unmet need for HIV prevention services for young women.

In an implementation science-driven project, entitled PrEP Delivery in Reproductive Health for AGYW, phase 2 (PrEDIRA 2), we launched delivery of PrEP in PAC clinics in Kenya to evaluate uptake and feasibility. To contextualize the structural-level determinants of program implementation and their influence on key program metrics, we drew upon constructs from the Consolidated Framework for Implementation Research (CFIR), particularly from the domains of the inner setting, outer setting, and process[32,33]. The objective of this analysis is to describe PrEP metrics among young women in PAC clinics and to evaluate associations between structural factors and likelihood of PrEP offers and uptake.

**METHODS**

In this implementation science-driven evaluation, PrEDIRA 2 integrated PrEP into services for PAC at 14 clinics in Kisumu, Nairobi, and Thika, Kenya. Through project-supported technical advisors (TA) with longstanding experience with PrEP and HIV prevention, the project facilitated: 1) PAC clinic training on HIV risk assessment and clinical management of PrEP clients, 2) linkages between each facility and the Ministry of Health (MoH) PrEP commodities system to facilitate supply of PrEP medication and HIV test kits, 3) technical support to clinic staff to deliver PrEP, and 4) data abstraction of program data from each clinic to monitor key program metrics. PrEP services followed Kenya national guidelines which include self-reported sexual activity, a clinical evaluation to identify medical contraindications, and HIV testing to confirm HIV-negative status prior to PrEP dispensing[51]. Eligible clients were offered PrEP and could accept or decline with reasons for the decline captured in the medical record. All PAC clients were offered PrEP regardless of age and data on women under 30 years old were abstracted from medical records into a web-based data management system (REDCap, ITHS University of Washington) [52,53].

Technical advisors from the project trained staff from participating facilities on PrEP eligibility and PrEP delivery, including but not limited to HIV prevention counseling for AGYW accessing care after pregnancy loss, benefits of PrEP and family planning (FP), specifics of delivering integrated PrEP and FP, and good clinical research practices. We augmented existing PrEP training materials with specific focus on PrEP integrated with PAC services. The final component of clinic-wide training included a one-day onsite visit by the training team to each clinic to observe mock patient visits and discuss patient flow efficiencies with the facility team. At the end of this visit, the training team completed a proficiency checklist. The training team worked closely with the facility to ensure the proficiency in each delivery element before being activated to deliver the intervention. Additional continuing medical education trainings were completed on an as needed basis and included providers that were absent from the initial training day.

Ethical review committees at Kenya Medical Research Institute (CMR/P00158/4209, CCR/020504201), Marie Stopes International (#001-21), and University of Washington (STUDY00012143) approved the research protocol.

**System and Clinic Factors**

PAC clinics were categorized as private or public and with high or low clinic volume in order to conduct stratified randomization for an enhanced program for retention activities, including post-initiation phone calls and follow-up appointment reminder cards. To collect additional information on structural influences, we used the Consolidated Framework for Implementation Research (CFIR) to identify domains of system- and clinic-level factors that might be relevant for the PAC settings[33]. System-level factors included the availability of commodities for PrEP and HIV testing, measured by collecting dates of stock outs during the PrEDIRA 2 implementation period; women counted as exposed to a stockout if the clinic they attended ever

experienced a stockout.. Clinic-level factors included clinic type (private vs. public), clinic volume based on number of PAC clients per month (high vs. low flow), proportion of PAC clinic staff who were PrEP-trained providers (all vs. some), engagement of PAC administrative leadership with the PrEP program (highly engaged vs. less engaged), sufficient numbers of staff to support offering PrEP to all PAC clients (sufficient vs. not), sufficient space to ensure privacy when offering PrEP to PAC clients (sufficient vs. not), presence of a champion for PrEP (present vs. not), and the cohesiveness with which PrEP tasks were integrated into other standard PAC clinical tasks (cohesive vs. not). Structured interviews were conducted with the technical advisors to elicit descriptions of each clinic and determine the category of each factor that best fit the clinic, treating category as static over the duration of the study.

**Statistical Methods**

Each clinic met capacity to begin implementation of their PrEP program on different days, as they were trained on PrEP and established linkages to commodities. Data analyzed from each clinic included time elapsed from PrEP program launch until November 18, 2022. We utilized descriptive statistics to summarize system and clinic factors at the PAC clinics and women who attended the PAC clinics. We generated figures to describe PrEP offers and uptake across time and to describe the proportion of PAC clients that were offered PrEP and initiated PrEP, defined as dispensing of initial PrEP bottle.

We utilized modified Poisson regression models to estimate relative risks (RRs) for the association of structural factors with probability of PrEP offers and uptake among AGYW in PAC clinics. These models employed sandwich estimators to adjust standard errors for use of a binomial outcome and for clustering within clinics, with Fay and Graubard small-sample adjustment for the small number of clusters[54,55]. We constructed a multivariable model that included client's age *a priori* and added additional factors that were associated with PrEP offer/use

at a p-value <0.2 level in univariate models except where predictors turned out to be collinear or unstable. In a sensitivity analysis, data were limited to the subset of the first 9 months of each clinic's implementation to assess the effect of growing familiarity with PrEP program delivery. SAS 9.4 (Cary, NC) and R (version 4.2.2) were used for statistical analysis, with small-sample adjustment using the R package *saws* (version 0.9-7.0) default method, and Microsoft Excel (Microsoft Corporation) was used for visualizations.

**FINDINGS**

Across 14 PAC clinics, data were abstracted from 6877 AGYW (median age: 24, min: 15, max: 30 years) during the study period between March 1, 2021 to November 18, 2022. Overall, 57% of AGYW were offered PrEP (n=3944) and 14.1% initiated PrEP, defined as dispensing of initial PrEP bottle (n= 970; Figure 1). Across the implementation period of 209 program-months, clinics experienced fluctuations in the number of PAC clients as well as of PrEP offers and PrEP initiations: peaks in PAC clients occurred in March 2022, PrEP offers during June 2022, and PrEP initiations grew over time with high points in March, June, and September 2022 (Figure 2). In the distribution of PAC clinic characteristics, most clinics were private (n=8, 57.1%; Table 1), had highly engaged administrative leadership (n=9, 64.3%), had low client flow (n=8, 57.1%), had some but not all PAC providers trained to deliver PrEP (n=8, 57.1%), and did not have staffing numbers (n=12, 85.7%) and space (n=8, 57.1%) to facilitate widespread PrEP counseling. One-third of clinics had PrEP champion emerge during the project (n=5, 35.7%) and it was uncommon for PrEP tasks to be well integrated with other clinical roles (n= 2, 14.3%). Stock outs of PrEP and HIV testing commodities were relatively rare and occurred in 5.8% and 28% of program-months, respectively. Nevertheless, in the distribution of clients within PAC clinics, most AGYW were seen in PAC clinics that had experienced at least some amount of PrEP commodities stock outs (n=5174, 75.2%; Table 1), had a high clinic volume (n=4341, 63.1%), and had highly engaged

administrative leadership (n=3842, 55.9%). Public clinics all experienced at least one HIV testing stockout while no private clinics did.

In univariate models, PrEP offers were statistically significantly more frequent among women in PAC clinics that had never experienced PrEP commodities stock out vs. ever (86.3% vs. 47.8%, relative risk (RR): 1.81, 95% CI: 1.1-2.95; Table 2), had ever experienced HIV testing commodities stock out vs. never (80.5% vs. 42.5%, RR: 1.89, 95% CI: 1.26-2.78), had all providers trained vs. some (80.8% vs. 48.9%, RR: 1.65 , 95% CI: 1.01, 2.68), and were public vs. private (80.5% vs. 42.5%, RR: 1.89, 95% CI: 1.26-2.78). Our multivariable model included client age, PrEP commodities, HIV testing commodities/clinic type, leadership support, staffing, and role cohesion. We adjusted training for client age, role cohesion, and staffing due to collinearity with other variables. PrEP offers remained statistically more frequent among women in PAC clinics that had never experienced PrEP commodities stock outs (adjusted relative risk (aRR): 1.39, 95% CI: 1.05-1.84), ever experiences HIV testing commodities stock outs (aRR: 1.72, 95% CI: 1.00, 2.96), had all providers trained (aRR: 1.77, 95% CI: 1.13, 2.79), and were public clinics (aRR: 1.72, 95% CI: 1.00, 2.96).

PrEP uptake was significantly higher among women in PAC clinics that had never experienced PrEP commodities stock out vs. ever (26.8% vs. 9.9%, RR: 2.71, 95% CI: 1.44-5.09; Table 3), had ever experienced HIV testing commodities stock out vs. never (22.4% vs. 8.8%, RR: 2.55, 95% CI: 1.39-4.67), had all providers trained vs. some (25.8% vs. 9.9%, RR: 2.61, 95% CI: 1.38-4.92), and were public vs. private clinics (22.4% vs. 8.8%, RR: 2.55, 95% CI: 1.39-4.67). Our multivariable models were limited by collinearity. HIV testing commodities/clinic type were adjusted for client age, space, and staffing. PrEP commodities was adjusted for client age and staffing, and training was adjusted for client age, space, and staffing. PrEP uptake remained statistically more frequent among women in PAC clinics that had never experience PrEP

commodities stock outs vs. ever (aRR: 2.34, 95% CI: 1.31-4.20), had ever experiences HIV testing commodities stock out vs. never (aRR: 2.64, 95% CI: 1.54-4.51), had all providers trained (aRR: 1.93, 95% CI: 1.01-3.72), and were public vs. private clinics (aRR: 2.64, 95% CI: 1.54-4.51).

The results were largely similar when limiting to data among the first 9 months of a program implementation (Table 2 and Table 3). Differences between the full study period and the initial 9 months of each clinics program included magnitude of the associations being larger for PrEP uptake in the initial 9 months. In contrast to the full study period, high volume vs. low volume clinics had fewer PrEP offers (49.7% vs. 56.7%, RR: 0.87, 95% CI: 0.47-1.63) and uptake (11.3% vs. 12.5%, RR: 0.91, 95% CI: 0.34-2.44) in the initial 9 months, however these associations were not statistically significant. Alternative parametrizations of administrative support and role cohesion did not substantially change interpretations.

**INTERPRETATION**

To our knowledge, this is the first description of implementation metrics when PrEP is integrated into post-abortion care with PrEP services in Africa. The PrEDIRA 2 project abstracted data on nearly 7000 AGYW across 14 PAC clinics in 3 counties in Kenya. PrEP was frequently offered to (60%) and infrequently initiated by (14% overall, and 25% of those offered) PAC clients. Across the implementation period, clinics experienced fluctuations in the number of PAC clients as well as of PrEP offers and PrEP initiations. In PAC clinics, the key structural factors that were associated with both PrEP offers and uptake were stockouts of PrEP and HIV testing commodities, training, and type of clinic (private vs. public). Similar signals were picked up across the full study period and in the first 9 months of each PAC clinic's PrEP program roll out.

This implementation project included a wide variety of PAC clinics. Some public PAC clinics were nested within gynecology or maternal and child health wards of general and referral hospitals that tended to experience higher client volumes. Small, private PAC clinics in Kisumu were standalone community care clinics that offered primary care, HIV/STI care, and maternal care, where there were lower client volumes and few providers. Private clinics in Nairobi had an array of reproductive health services including family planning, maternal care, and HIV/STI care and were either high volume or low volume clinics. Given the vast differences between these settings, while PrEP training and programming used the same materials across settings, the experiences of providers and clients with PrEP services were distinct with respect to the health systems environment in which they operate.

Structural drivers have significant bearing on communities' access to treatment as well as individual choices about uptake and adherence to PrEP. Low proportions of trained providers and frequent staff turnover can yield inconsistency in the quality of care and sometimes leads to increased clinic wait times, delayed linkages to needed care, negative patient interactions with staff, and counselling that de-centers the patients' needs and experiences[29,56–58]. In terms of material resources, health providers also cite availability of medications and HIV testing services as a critical component to creating and sustaining successful program and when deficient, programs can fail to provide services[56]. Strengthening HIV programs throughout the health sector requires investments in human resources and mobilizing systems to support long-term planning for commodities[58].

There are limitations to these findings, including the dichotomization of variables capturing structural constructs. For example, the technical advisors described the engagement of administrative leadership with a range of characteristics that were used to dichotomize each clinic into being highly engaged vs. less engaged, and the impact of this clinical factor on PrEP offers

and uptake may be diluted or misclassified. However, iterative parametrizations did not substantially change interpretations. Additionally, most factors did not have this same limitation because we were able to quantitatively determine whether all or some providers were trained, whether a clinic had ever experienced PrEP/HIV testing commodities issues, clinic volume, and private vs. public clinic type. In our 14 clinics, clinic type (private/public) was completely collinear with HIV testing stockouts and we are therefore unable to independently estimate those effects. Another limitation is that we assessed data across the entire study period, which may not account for seasonal trends and the PAC clinic's familiarity with and mastery of PrEP counseling and initiation that grows organically with time and we have not conducted a time trend to assess whether key metrics of success increased over time, which is common when a new or revised service is put into practice. However, we did assess data limited to the initial 9 months of PrEP program implementation for each clinic and results were largely similar. Lasltly, we had a small number of clinics, which limited our ability to examine structural factors that were less common and robustly generate adjusted models.

Key recommendations for challenges within health systems that stem from this work are echoed by other PrEP programs in Africa and include the need for robust supply chain management with coordination and prediction of stock demands for PrEP and HIV testing commodities, to better prevent bottlenecks and serve key populations for HIV prevention[28–30]. Sufficient staffing and PrEP training are fundamental factors to increase a facility's ability to provide PrEP services to clients and avoid missed opportunities[29]. Lastly, administrative leadership support and involvement in promoting PrEP programming has significant bearing on day-to-day activities and potential to improve quality of services and reduce staff turnover. Individual facility leadership can be empowered to bring such data to higher levels within their health systems to effectuate supply chain system changes.

These data highlight some key hurdles to navigate the implementation of PrEP in reproductive health settings. Greater program success will require investments in systems, such as human resources and PrEP and HIV testing commodities, to create stable availability and enable providers to have confidence that PrEP will be available when prescribed. In facilitating greater PrEP offers and initiations, persistence in improved HIV prevention coverage for priority populations will be essential in reducing the disproportionately high HIV incidence among young women in East and southern Africa. Integrating PrEP into PAC settings is feasible and serves as opportunity to introduce PrEP more widely in the healthcare system and service points familiar to women. Reducing the impact of systemic problems directly impacts lives and can protect and empower young women.

## Research in context

### Evidence before this study

Post-abortion care (PAC) settings were previously assessed as a possible entry-point for HIV prevention, or PrEP, services for adolescent girls and young women (AGYW) in Kisumu and Thika, Kenya. Researchers found that among 200 Kenyan AGYW accessing services for PAC, there was a high interest in PrEP (46.4%) and one-third received a referral. Thus, PAC is an as-yet underutilized setting for the integration of PrEP and has potential to serve an unmet need for HIV prevention services for young women.

### Added value of this study

To our knowledge, this is the first description of integrating PrEP into post-abortion care in Africa. This project abstracted data on 6877 adolescent girls and young women across 14 PAC clinics in 3 counties in Kenya. Offers of PrEP were made to 57.4% of all PAC clients and 14.1% initiated PrEP. Key system-level factors that were associated with PrEP offers and uptake were stockouts of PrEP and HIV testing commodities, training, and type of clinic (private vs. public).

**Implications of all the available evidence**

These data highlight some key hurdles to navigate to improve the implementation of PrEP in reproductive health settings. Greater program success will require investments in systems, such as human resources and PrEP and HIV testing commodities, to create stable availability and enable providers to have confidence that PrEP will be available when prescribed.

**Table 1. Distribution of System-Level Factors among PrEDIRA 2 PAC clinics and clients**

| | PAC clinics, N (%) | Clients, N (%) |
|---|---|---|
| | Total N=14 | Total N=6877 |
| **System Factors** | | |
| Ever experienced PrEP commodities stock out | 9 (64.3%) | 5174 (75.2%) |
| Ever experienced HIV testing commodities stocked out | 6 (42.9%) | 2682 (39.0%) |
| **Clinic Factors** | | |
| Public clinic (clinic type) | 6 (42.9%) | 2682 (39.0%) |
| High clinic volume (clinic volume) | 6 (42.9%) | 4341 (63.1%) |
| All PAC providers trained | 6 (42.9%) | 1816 (26.1%) |
| Highly engaged facility leadership | 9 (64.3%) | 3842 (55.9%) |
| Sufficient Staffing for PrEP | 2 (14.3%) | 155 (2.3%) |
| Sufficient Space for PrEP | 6 (42.9%) | 2788 (40.5%) |
| Had a champion provider present | 5 (35.7%) | 2321 (33.8%) |
| Had cohesion of PrEP tasks within other clinical tasks | 2 (14.3%) | 673 (9.8%) |

**Figure 1. PrEP cascade outcomes among PAC clients**

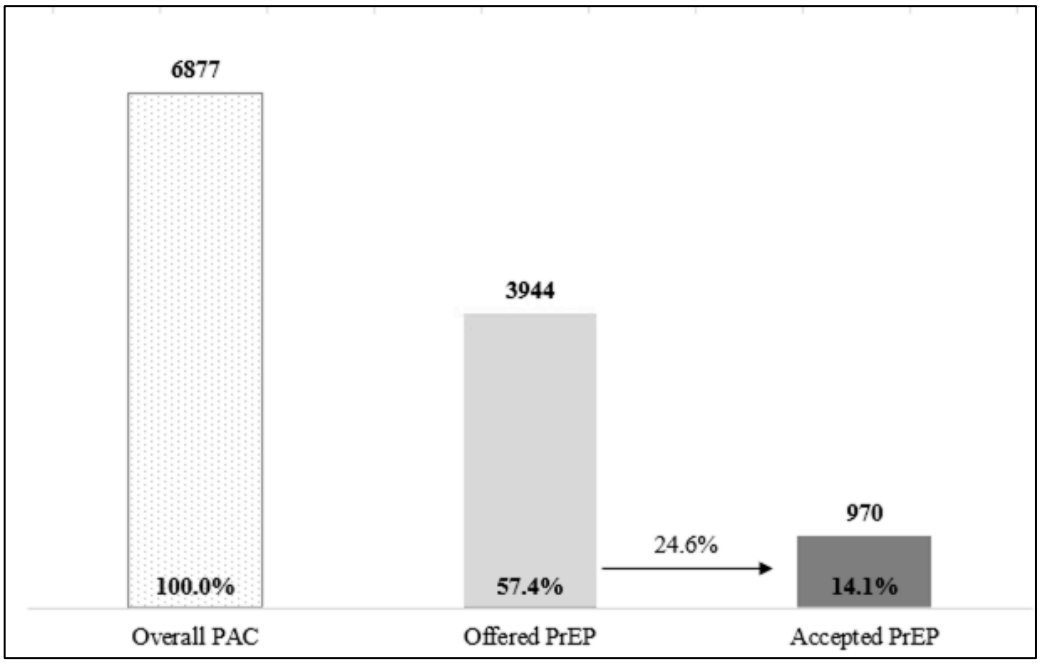
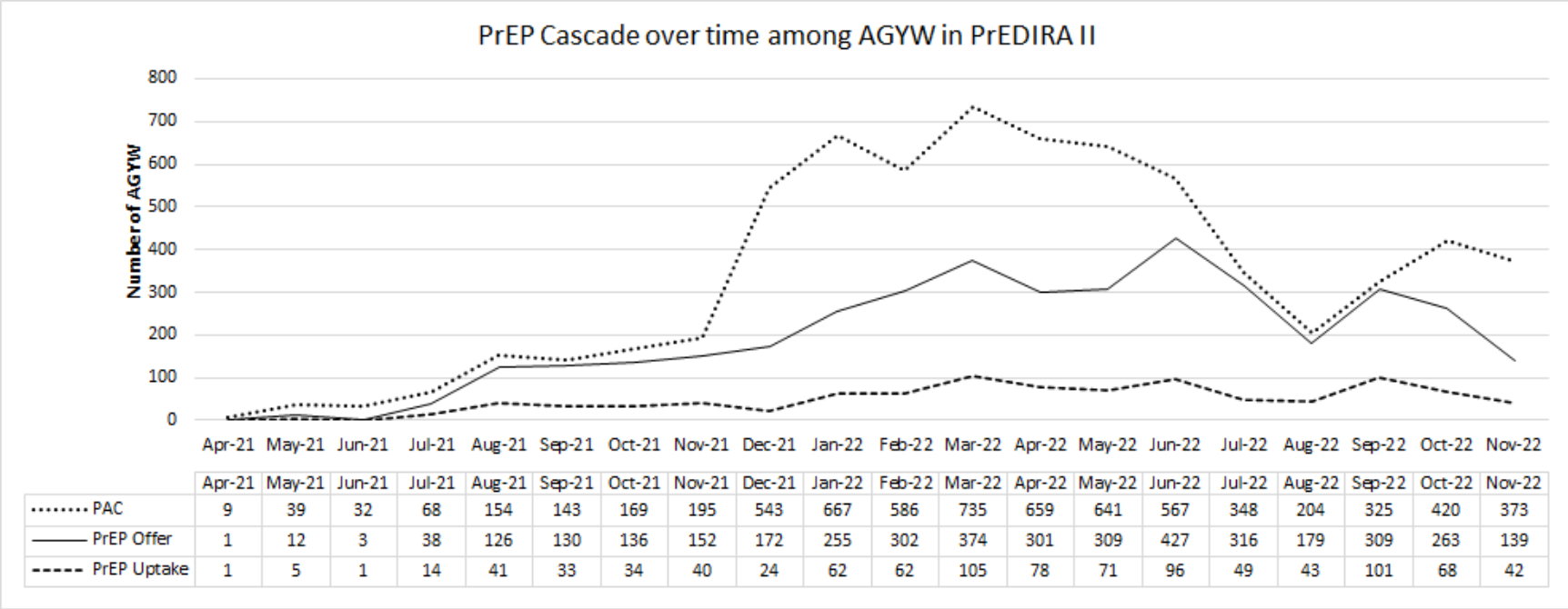


**Figure 2. PrEP offers and PrEP uptake among AGYW PAC clients, over time**




| | Apr-21 | May-21 | Jun-21 | Jul-21 | Aug-21 | Sep-21 | Oct-21 | Nov-21 | Dec-21 | Jan-22 | Feb-22 | Mar-22 | Apr-22 | May-22 | Jun-22 | Jul-22 | Aug-22 | Sep-22 | Oct-22 | Nov-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PAC | 9 | 39 | 32 | 68 | 154 | 143 | 169 | 195 | 543 | 667 | 586 | 735 | 659 | 641 | 567 | 348 | 204 | 325 | 420 | 373 |
| PrEP Offer | 1 | 12 | 3 | 38 | 126 | 130 | 136 | 152 | 172 | 255 | 302 | 374 | 301 | 309 | 427 | 316 | 179 | 309 | 263 | 139 |
| PrEP Uptake | 1 | 5 | 1 | 14 | 41 | 33 | 34 | 40 | 24 | 62 | 62 | 105 | 78 | 71 | 96 | 49 | 43 | 101 | 68 | 42 |

**Table 2 Associations of Structural Factors with PrEP offers among PAC clients**

| | All data (N= 6877) | | | | | First 9 months for each clinic (N= 5102) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Systematic Factors** | **N (%)** | **RR** | **95% CI (p-value)** | **aRR*** | **95% CI (p-value)** | **N (%)** | **RR** | **95% CI (p-value)** | **aRR*** | **95% CI (p-value)** |
| PrEP commodities (ever vs. never stocked out) | | | | | | | | | | |
| Ever | 2474/5173 (47.8%) | REF | | REF | | 1790/4016 (44.6%) | REF | | REF | |
| Never | 1470/1703 (86.3%) | 1.81 | 1.10, 2.95 (0.0279) | 1.39 | 1.05, 1.84 (0.0319) | 895/1086 (82.4%) | 1.85 | 1.09, 3.14 (0.0305) | 1.44 | 1.00, 2.09 (0.0517) |
| HIV testing commodities (ever vs. never stocked out) | | | | | | | | | | |
| Ever | 2160/2682 (80.5%) | 1.89 | 1.29, 2.78 (0.0049) | 1.72 | 1.00, 2.96 (0.0491) | 1143/1509 (75.8%) | 1.76 | 1.11, 2.79 (0.0214) | 1.49 | 0.87, 2.57 (0.1011) |
| Never | 1784/4195 (42.5%) | REF | | REF | | 1542/3593 (42.9%) | REF | | REF | |
| Clinic Type | | | | | | | | | | |
| Public | 2160/2682 (80.5%) | 1.89 | 1.29, 2.78 (0.0049) | 1.72 | 1.00, 2.96 (0.0491) | 1143/1509 (75.8%) | 1.76 | 1.11, 2.79 (0.0214) | 1.49 | 0.87, 2.57 (0.1011) |
| Private | 1784/4195 (42.5%) | REF | | REF | | 1542/3593 (42.9%) | REF | | REF | |
| Clinic Volume | | | | | | | | | | |
| High client flow | 2529/4341 (58.3%) | 1.04 | 0.59, 1.84 (0.866) | | | 1479/2975 (49.7%) | 0.87 | 0.47, 1.63 (0.6365) | | |
| Low client flow | 1415/2536 (55.8%) | REF | | | | 1206/2127 (56.7%) | REF | | | |
| **Clinic Factors** | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Trained providers | | | | | | | | | | |
| All providers | 1467/1816 (80.8%) | 1.65 | 1.01, 2.68 (0.0455) | 1.77** | 1.13, 2.79 (0.0272) | 844/1104 (76.5%) | 1.66 | 0.97, 2.83 (0.0584) | 1.66** | 1.07, 2.6 (0.03244) |
| Some providers | 2477/5061 (48.9%) | REF | | | | 1841/3998 (46.1%) | REF | | REF | |
| Leadership support | | | | | | | | | | |
| Less engaged | 1340/3035 (44.2%) | REF | | | | 965/2418 (39.9%) | REF | | | |
| Highly engaged | 2604/3842 (67.8%) | 1.53 | 0.82, 2.89 (0.1515) | | | 1720/2684 (64.1%) | 1.61 | 0.88, 2.94 (0.1037) | | |
| Adequate Staffing (& Time) for PrEP | | | | | | | | | | |
| No | 3789/6722 (56.4%) | REF | | | | 2550/4967 (51.3%) | REF | | | |
| Yes | 155/155 (100%) | 1.77 | 0.94, 3.34 (0.0595) | -- | -- | 135/135 (100%) | 1.95 | 1.04, 3.65 (0.0447) | -- | -- |
| Space for PrEP | | | | | | | | | | |
| No | 2135/4089 (52.2%) | REF | | | | 1556/3178 (49.0%) | REF | | | |
| Yes | 1809/2788 (64.9%) | 1.24 | 0.41, 1.56 (0.469) | | | 1129/1924 (58.7%) | 1.2 | 0.56, 2.55 (0.5813) | | |
| Champion provider presence | | | | | | | | | | |
| No | 2515/4556 (55.2%) | REF | | | | 1674/3374 (49.6%) | REF | | | |
| Yes | 1429/2321 (61.6%) | 1.12 | 0.51, 2.44 (0.7396) | | | 1011/1728 (58.5%) | 1.18 | 0.51, 2.72 (0.6382) | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Role cohesion (of PrEP tasks within other clinical tasks) | | | | | | | | | | |
| Yes | 529/673 (78.6%) | 1.43 | 0.54, 3.76 (0.1900) | | | 420/531 (79.1%) | 1.6 | 0.45, 5.63 (0.161) | | |
| No | 3415/6204 (55.1%) | REF | | | | 2265/4571 (49.6%) | REF | | | |

aRR: Adjusted Relative Risk, PrEP: HIV pre-exposure prophylaxis, RR: Relative Risk
*Adjusted for client's age and all other variables p-value <0.2, except training which was collinear with clinic type/HIV commodities and PrEP commodities. Model included PrEP commodities, clinic type/HIV commodities, leadership support, staffing and role cohesion
**Adjusted for client's age and all other variables p-value <0.2, except clinic type/HIV commodities and PrEP commodities which were collinear with training. Model included leadership support, training, role cohesion, and staffing

**Table 3. The Association of Structural Factors and PrEP initiations among PAC clients**

| | All data (N= 6877) | | | | | First 9 months of each clinic's program (N= 5102) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N (%) | RR | 95% CI | aRR | 95% CI | N (%) | RR | 95% CI | aRR | 95% CI |
| **Systematic Factors** | | | | | | | | | | |
| PrEP commodities (ever vs. never stocked out) | | | | | | | | | | |
| Ever | 513/5174 (9.9%) | REF | | REF | | 345/4016 (8.6%) | REF | | REF | |
| Never | 457/1703 (26.8%) | 2.71 | 1.44, 5.09 (0.009) | 2.34** | 1.31, 4.20 (0.0157) | 256/1086 (23.6%) | 2.74 | 1.33, 5.66 (0.0142) | 2.23** | 1.10, 4.52 (0.0344) |
| HIV testing commodities (ever vs. never stocked out) | | | | | | | | | | |
| Ever | 601/2682 (22.4%) | 2.55 | 1.39, 4.67 (0.0072) | 2.64* | 1.54, 4.51 (0.0069) | 311/1509 (20.6%) | 2.55 | 1.34, 4.88 (0.01) | 3.12* | 1.77, 5.50 (0.0042) |
| Never | 369/4195 (8.8%) | REF | | REF | | 290/3593 (8.1%) | REF | | REF | |
| Clinic Type | | | | | | | | | | |
| Public | 601/2682 (22.4%) | 2.55 | 1.39, 4.67 (0.0072) | 2.64* | 1.54, 4.51 (0.0069) | 311/1509 (20.6%) | 2.55 | 1.34, 4.88 (0.01) | 3.12* | 1.77, 5.50 (0.0042) |
| Private | 369/4195 (8.8%) | REF | | REF | | 290/3593 (8.1%) | REF | | REF | |
| Clinic Volume | | | | | | | | | | |
| High client flow | 646/4341 (14.9%) | 1.16 | 0.49, 2.78 (0.6995) | | | 336/2974 (11.3%) | 0.91 | 0.34, 2.44 (0.8248) | | |
| Low client flow | 324/2536 (12.8%) | REF | | | | 265/2127 (12.5%) | REF | | | |
| **Clinic Factors** | | | | | | | | | | |
| Trained providers | | | | | | | | | | |
| All providers | 469/1816 (25.8%) | 2.61 | 1.38, 4.92 (0.0103) | 1.93*** | 1.01, 3.72 (0.0487) | 286/1104 (25.9%) | 3.29 | 1.68, 6.43 (0.0043) | 2.77*** | 1.63, 4.71 (0.0048) |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Some providers | 501/5061 (9.9%) | REF | | REF | | 315/3998 (7.9%) | REF | | REF | |
| Leadership support | | | | | | | | | | |
| Less engaged | 302/3035 (10.0%) | REF | | | | 205/2418 (8.5%) | REF | | | |
| Highly engaged | 668/3842 (17.4%) | 1.74 | 0.53, 5.71 (0.2998) | | | 396/2684 (14.8%) | 1.74 | 0.53, 5.67 (0.3003) | | |
| Adequate Staffing (& Time) for PrEP | | | | | | | | | | |
| No | 889/6722 (13.2%) | REF | | | | 532/4967 (10.7%) | REF | | | |
| Yes | 81/155 (52.3%) | 3.95 | 0.63, 24.87 (0.0822) | | | 69/135 (51.1%) | 4.77 | 0.68, 33.32 (0.0739) | | |
| Space for PrEP | | | | | | | | | | |
| No | 410/4089 (10.0%) | REF | | | | 287/3178 (9.0%) | REF | | | |
| Yes | 560/2788 (20.1 %) | 2.0 | 0.85, 4.71 (0.0969) | | | 314/1924 (16.3%) | 1.81 | 0.66, 4.94 (0.203) | | |
| Champion provider presence | | | | | | | | | | |
| No | 567/4556 (12.5%) | REF | | | | 340/3374 (10.1%) | REF | | | |
| Yes | 403/2321 (17.4%) | 1.4 | 0.53, 3.65 (0.4186) | | | 261/1728 (15.1%) | 1.5 | 0.49, 4.59 (0.3973) | | |
| Role cohesion (of PrEP tasks within other clinical tasks) | | | | | | | | | | |
| Yes | 137/673 (20.4%) | 1.52 | 0.33, 6.96 (0.32) | | | 103/531 (19.4%) | 1.78 | 0.21, 15.05 (0.2681) | | |
| No | 833/6204 (13.4%) | REF | | | | 498/4571 (10.9%) | REF | | | |

aRR: Adjusted Relative Risk, PrEP: HIV pre-exposure prophylaxis, RR: Relative Risk
*Adjusted for client's age and all other variables p-value <0.2, except training and PrEP commodities which were collinear with clinic type/HIV commodities. Model included HIV commodities/clinic type, space, and staffing.

** Adjusted for client's age and all other variables p-value <0.2, except training, space, and clinic type/HIV commodities which were collinear with PrEP commodities. Model included PrEP commodities and staffing.
*** Adjusted for client's age and all other variables p-value <0.2, except clinic type/HIV commodities and PrEP commodities which were collinear with training. Model included training, space, and staffing.

# Chapter 4. The Effect of Stigma on Family Planning and HIV Pre-Exposure Prophylaxis Decisions of Young Women Accessing Post-Abortion Care in Kenya

**The Effect of Stigma on Family Planning and HIV Pre-Exposure Prophylaxis Decisions of Young Women Accessing Post-Abortion Care in Kenya: Early findings from a Prospective Cohort-Study**

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**Target Journal:** Sexual and Reproductive Health Matters

## ABSTRACT

### Background
Adolescent girls and young women (AGYW) in East and southern Africa face parallel epidemics of unintended pregnancy and HIV incidence, and sexual health decisions are often dominated by intersecting stigmas.

### Methods
In an implementation science project integrating delivery of daily, oral HIV pre-exposure prophylaxis (PrEP) into 14 post-abortion care (PAC) clinics in Kenya, we enrolled a subset of AGYW (aged 15 to 30 years) who initiated PrEP into research. Utilizing log binomial models, we estimated the effect of PrEP stigma on PrEP continuation and adherence (measured via urine assay for tenofovir) and abortion stigma on family planning (FP) initiation.

### Results
Between April 2022 and February 2023, 401 AGYW were enrolled after initiating PrEP through their PAC provider, of which 120 (29.9%) initiated highly effective FP. Abortion stigma was more prevalent among those that were adolescents, were unmarried, and who reported social harm. Among 114 AGYW returning for the month 1 follow-up visit, 78.5% reported continuing PrEP and 50.0% had tenofovir detected. In this subset, higher levels of PrEP stigma were significantly associated with greater likelihood of PrEP adherence, but not PrEP continuation. For abortion stigma, the greater scores in the subdomain of isolation were significantly associated with greater likelihood of initiating a highly effective FP, while the greater scores in the subdomain of community condemnation were significantly associated with reduction in the likelihood of initiating a highly effective FP product.

### Discussion
PAC settings are a pivotal space to integrate stigma-informed counseling and to empower young women to optimize FP and PrEP decisions.

**Plain Language Summary**

Stigma drives social and health inequities by limiting individual's acceptance of and access to essential care. Young women in particular experience a heavy burden of stigma on their sexual health choices. Our goal is to estimate the effect of stigma on reproductive health decisions among young women in abortion settings. We enrolled into research a cohort of young women in Kenya who had recently received postabortal care and had chosen to start taking PrEP. In our study, 120 (29.9%) of women initiated a highly effective FP method, the most common methods being oral contraceptives (11.0%) or injectable (10.7%). At month 1 follow-up, 95 (78.5%) women reported continuing PrEP and 60 (50.0%) were adherent, as detected via urine. We found that initiation of family planning method after an abortion was influenced by abortion stigma, stemming from the feelings of isolation as well as community condemnation. We also found that PrEP stigma was common and higher among those who were adherent to PrEP. In conclusion, stigma is a common experience for young women to navigate in their sexual health decisions and must be addressed to better provide health care. To tackle stigma-driven inequities as a critical barrier to providing sexual and reproductive health care, these findings highlight needed multilevel interventions to address stigma in order to optimize health decision-making that provide young women with the tools needed to avoid both pregnancy and HIV.

**BACKGROUND**

Adolescent girls and young women (AGYW) in East and southern Africa represent a disproportionate percentage of new HIV infections. While there have been pronounced efforts to increase rollout and uptake of HIV pre-exposure prophylaxis (PrEP), AGYW continue to bear the burden of 63% of new HIV infections in the region[40]. In Kenya, AGYW have a 2.2-fold higher HIV incidence than their male age counterparts and represent one-third of all new infections yearly[41,42]. HIV prevention programs aimed at AGYW cite high PrEP uptake but frequent discontinuation, with approximately 50-85% of AGYW discontinuing PrEP within 1-3 months[45,59–62]. This discontinuation from PrEP has been interpreted to signify an incongruence of daily pill-taking with AGYW lifestyle, including the inconvenience, unfamiliarity, and stigma with daily pill-taking[63,64].

In addition to HIV, AGYW in Kenya face an epidemic of unintended pregnancy[46,47]. More than 40% of unintended pregnancies end with an abortion, and AGYW comprise nearly half of all clients seeking post-abortion care (PAC)[46,47]. PAC settings provide a set of core interventions for essential reproductive health care, including emergency treatment for incomplete abortions, provision of family planning, and sexual health counseling[49,65]. For AGYW receiving PAC, risk for subsequent pregnancy is high and may be coupled by risk for HIV and other sexually transmitted infections[66]. Thus, PAC is an underutilized setting for the integration of PrEP and is likely to serve an unmet need for HIV prevention services for AGYW.

The context in which AGYW make PrEP decisions is often dominated by intersecting considerations about stigma around HIV medications, sexual activity, and youth and female autonomy[18–24]. AGYW often face difficult challenges navigating their sexual autonomy given age-specific vulnerabilities, a lack of agency or experience in negotiating sex, heightened awareness of social stigma pertaining to gender norms and AGYW's societal status, economic disempowerment sometimes leading to transactional sex, and difficulty accessing sexual health information and services[2–8]. The defining feature of stigma involves a level of discrimination that denies individuals full social acceptance and thereby drives social and health inequities[35,36]. The

complexity of stigma experiences of AGYW in PAC settings is an insufficiently studied area of research and is an important consideration of sexual health decision-making and the adoption of services that further provides autonomy and safety.

In an implementation science project delivering PrEP services within PAC clinics in Kenya, we hypothesized that stigma has a bearing on women's sexual and reproductive health decision-making processes, and we conducted analyses to estimate the effect of 1) PrEP stigma on PrEP adherence and continuation and 2) abortion stigma on family planning initiation among AGYW.

## METHODS

PrEDIRA II is an implementation science project to launch and support PrEP delivery integrated into services provided at 14 PAC clinics in Kisumu, Nairobi, and Thika, Kenya. Prior to launch, technical advisors (TAs) conducted facility-based trainings for the rollout of the PrEP program and facilitated linkages between each facility and Ministry of Health supply chain for PrEP commodities. During the program, TAs provided support to facility staff who counseled and prescribed PrEP, and abstracted data on PrEP dispensing from medical charts. Eligibility for PrEP included an HIV-negative test, a clinical assessment with no medical contraindications, and self-reported sexual activity, in accordance with Kenya national guidelines[67]. Women initiating PrEP through PAC continued to receive PrEP care, including HIV testing and PrEP refills, through the PAC program or another PrEP location of their choice.

A subset of AGYW initiating PrEP through PrEDIRA II were enrolled into a research cohort to evaluate the factors that shaped PrEP care over time. All PAC clients who were initiating PrEP were offered enrollment into a 6-month research cohort, and the first 400 to be interested and eligible were enrolled. In addition to PrEP initiation through a participating PAC, eligibility in the research cohort was limited to women between the ages 15-30 years who were willing and able to provide written informed consent. Research procedures included visits one month after PrEP initiation and quarterly thereafter up to 6 months. At each visit, participants completed interviewer-

administered questionnaires to assess demographics, sexual behavior and partnership characteristics, empowerment, social harm, mental health, social support, HIV risk perceptions and PrEP readiness, anticipated PrEP disclosure, family planning methods, PrEP use, and sexually transmitted infection symptoms. Urine was collected for TFV measurement at all follow up visits. To meet the objectives of the larger study, all PAC clinics were randomized to provide either the foundational PrEP program or an enhanced PrEP program that included multiple post-PrEP check-in calls and appointment reminder cards.

**HIV Prevention Stigma Scale (HPSS)**

The HIV Prevention Stigma Scale (HPSS) was recently developed among men who have sex with men (MSM) in the US[68]. This measure includes 2 parts (Likert and Semantic Differential) and has not yet been validated outside of the US context, but has been used among MSM in South Africa[69] and serodiscordant couples in Mozambique[70]. We utilized the 13 questions from the Likert portion of HPSS, which is measured on a range of 1 to 5, with each point increase indicating higher stigma. The HPSS was collected among PrEDIRA II clients at enrollment. Through consultation with team leadership, technical advisors, and younger members of the PrEDIRA team, we systematically reviewed each of the questions, made adaptations based on the study context, and piloted revised questions with the study team. For example, for the HPSS item around people using PrEP being viewed as “slutty” we also added the word “loose” to reflect cultural connotations around promiscuity (Supplementary Materials).

**Individual Level Abortion Stigma (ILAS)**

The Individual Level Abortion Stigma (ILAS) scale[71] is a widely-used continuous measure that has 20 items and captures four subdomains: worries about judgement, isolation, self-judgement, and community condemnation. The scale has a range of 1 to 5, with each point increase indicating higher stigma. The internal consistency and reliability have been assessed among young women in Kenya[72]. We adapted the ILAS scale items to initiate questions with

wording to include both pregnancy loss and abortion to capture the variety of pregnancy experiences women in PAC settings may face (Supplementary Material).

**PrEP use**

Self-reported PrEP continuation was assessed during the Month 1 follow-up visit and all quarterly visits. PrEP adherence was measured by quantifying tenofovir (TFV) in a point-of-care urine assay (Abbott/Alere Rapid Diagnostics)[73] 1-month after initiating PrEP and quarterly thereafter. Results were used by program staff to provide feedback to AGYW in real time about TFV detection and to engage AGYW in informed counseling about PrEP adherence and potential HIV exposure. The test was performed by trained personnel after self-collection of urine into sterile cups by research participants. TFV detection corresponds to PrEP use the past 3 days[73].

**Family Planning Initiation**

Family planning (FP) use was assessed at enrollment, by asking what methods of contraceptive the participant currently initiated subsequent to their abortion services. We categorized highly effective FP as use of an injectable, implantable device, intrauterine device, or oral contraceptives. The referent category included those who reported use of condoms or no contraceptives.

**Statistical Methods**

We used descriptive statistics to characterize the demographics, partnership dynamics, and both stigma measures (HPSS and ILAS) among young women included in this cohort. To create a dichotomous categorization of each stigma scale, we used the 75$^{th}$ percentile as the cut point to indicate high stigma.

To assess demographic and partnership correlates, we conducted log-binomial regression to estimate the relative risk of high PrEP stigma. To assess the relationship between PrEP stigma and PrEP adherence and continuation at Month 1, we used log binomial regression models. We decided *a priori* to include the type of PAC clinic (private or public) that the client attended, to account for socioeconomic status[74]. For models that included PrEP adherence and continuation,

we also included clinic-level enhanced arm assignment *a priori*. For models with PrEP adherence and continuation as the outcomes, we conducted three analyses to account for participants who did not attend their Month 1 visit: 1) excluded participants without a Month 1 visit, 2) assigned all participants who did not attend as non-adherent and discontinuing PrEP, and 3) assigned all participants who did not attend as adherent and continuing PrEP.

We, then conducted log-binomial regression of demographic and partnership factors to estimate the relative risk of high abortion stigma. To assess the relationship between abortion stigma and highly effective FP initiation, we used log binomial regression models. We decided *a priori* to include the type of PAC clinic (private or public) that the client attended and reported experiences of social harm[74,75]. All analyses were conducted in SAS version 9.4 (Cary, NC).

**Ethics**

All research participants provided written informed consent prior to initiating research procedures. Adolescents aged 15-17 were included in this study under guidelines for emancipated minors. Ethical review committees at Kenya Medical Research Institute (CMR/P00158/4209, CCR/020504201), Marie Stopes International (#001-21), and University of Washington (STUDY00012143) approved the research protocol.

## RESULTS

Between April 2022 and February 2023, a total of 401 AGYW between the ages of 15-and 30-years initiating PrEP were enrolled into research. The median age was 22 years (interquartile range: 20-25), 40.9% were currently partnered, and 60.3% earned an income in the past year (Table 1). In terms of partnership characteristics, some women had new sexual partners in the past 3 months (18.5%), and most did not know their partners' HIV status(es) (61.5%). After receiving PAC services, 120 (29.9%) of women initiated a highly effective FP method (10.7% injectable, 11.0% oral). Among women who attended the month 1 follow-up, 95 (78.5%) women reported continuing PrEP and 60 (50.0%) had urine TFV detected.

**PrEP stigma**

Overall, participants had a mean score of 2.8 (standard deviation (SD): 0.56) on the HPSS scale, corresponding to the Likert category of "Neutral." Items that most frequently had a response of "Strongly agree" or "Agree," indicating a high level of stigma, included people taking PrEP "are not taking care of their health," "would be viewed as 'slutty' or 'loose,'" "experiencing negative judgement," "would not feel proud to take PrEP daily," "would experience problems telling their sexual partner," and would not be someone they'd have sex with (Figure 1). The item most often with "Strongly disagree" or "Disagree" was "someone taking PrEP would be treated unfairly by their doctor." There were no significant demographic or partnership characteristics correlated with high PrEP stigma (Table 2).

Among a subset who attended Month 1 visit, PrEP stigma was significantly associated with PrEP adherence when measured via urine TFV (adjusted relative risk (aRR: 1.33, 95% CI: 1.07, 1.66; Table 3), after adjustment for clinic type and enhanced/standard of care PrEP program type. However, PrEP stigma was not significantly associated with self-reported PrEP continuation (aRR: 1.08, 95% CI: 0.995, 1.18). When missing data were assigned PrEP outcomes of non-adherent and discontinuing, the effects of stigma on PrEP adherence and PrEP continuation were closer to the null and non-significant. When the missing data were assigned to outcomes of adherent and continuing, PrEP stigma and PrEP continuation were also closer to the null and the association with adherence was statistically significant (aRR: 1.07, 95% CI: 1.01, 1.14).

**Abortion stigma**

At enrollment, respondent's ILAS scores were distributed in the middle of the scale (mean: 2.53, SD: 0.55, Table 1). Responses to the self-judgment subdomain (mean: 2.88, SD: 0.79) and community condemnation subdomain (mean: 4.45, SD: 0.7) were concentrated on the high end of the scale while responses to the worries about judgement subdomain (mean: 1.9, SD: 0.99) were the concentrated on the low end of the scale.

High abortion stigma was significantly more common among clients that were single (26.1% vs. 13.1%, relative risk (RR): 2.09, 95% CI: 1.26 - 3.49, Table 2) and partnered (21.7% vs. 13.1%, RR: 1.7, 95% CI: 1.03, 2.81) as compared to women who were married. High abortion stigma was significantly more common among clients that were aged 15-19 (37.0% vs. 18.6%, relative risk (RR): 1.99, 95% CI: 1.24, 3.21) as compared to women who were 25-30. High abortion stigma was also significantly more common among AGYW who reported experiences of social harm by any of their partners in the past 3 months (32.8% vs. 21.0%, RR: 1.56, 95% CI: 1.05, 2.33) as compared to those who did not report experiences of social harm.

Participants with higher abortion stigma scores were significantly more likely to initiate highly effective contraception (adjusted RR (aRR): 1.48, 95% CI: 1.19, 1.84; Table 4) after adjustment for reported experiences of social harm and whether the clinic the client attended was private or public. The subdomain of isolation (aRR: 1.59, 95% CI: 1.38, 1.84) was significantly associated with an increase in highly effective FP use, while the subdomain of community condemnation (aRR: 0.83, 95% CI: 0.72, 0.96) was significantly associated with a reduction in highly effective FP use.

## DISCUSSION

At the intersection of HIV prevention and abortion care, this is the first to our knowledge study to assess the overlapping stigmas experienced by young women and their effects on reproductive health decisions. When examining the subdomain and item scores of ILAS and HPSS, we found a high burden of both abortion stigma and PrEP stigma among young women in this study. Among a subset of women who attended their Month 1 visit, higher PrEP stigma scores were observed among women who were adherent to PrEP when measured via urine TFV, but not among women who reported continuation of PrEP. Higher abortion stigma scores were detected among women who initiated highly effective FP. Collectively, these findings highlight the

levels of stigma that are present among young women being offered PrEP and FP in PAC settings as well as the complexity of roles that stigma may play in sexual health decision-making.

Abortion stigma negatively influences sexual and reproductive health outcomes through pathways that lead to isolation, secrecy, and unawareness of safe abortion methods[76]. Considering the role of family planning in preventing unintended pregnancy, PAC settings can be optimal to deliver family planning and counseling to reduce the burden of abortion stigma. In this study, high abortion stigma was more prevalent among those that were adolescents (aged 15-19), were unmarried, and who reported social harm, pointing to subgroups who may benefit from counseling to reduce stigma. Only 30% of women across 14 PAC clinics initiated highly effective FP after their abortion. The subdomain of community condemnation (mean: 4.5 out of 5) was a nearly universal experience of abortion stigma reported by young women, and was the latent construct driving down the overall association between abortion stigma and initiation of highly effective FP. Similar findings have been reported among secondary-school students in Kenya, in that abortion is widely viewed as sin (89% of respondents) and as shameful for the person's family (73%)[77]. Alternatively, the subdomain of isolation, which aligns with being unable to disclose their abortion to and feeling unsupported by people they were close to, was associated with increases in highly effective FP use, suggesting that privacy may be necessitated in navigating stigma to receive care. These subdomains indicate that the decision to use highly effective FP was related to different aspects of stigma, stemming from the community and social isolation. Qualitative work has previously described abortion stigma among women in Kenya, and women receiving PAC have described self-reliance as being vital to overcome internalized and perceived stigma, isolation and secrecy as a necessities to avoid stigma, and challenges accessing and affording safe abortion services[78–83]. Together, these findings highlight the importance of identifying opportunities to reduce stigma and diminish its effect on young women.

Few validated measures of PrEP stigma exist and are tailored for communities in Africa, and so consequently the impact of stigma has been insufficiently captured as a determinant of

engagement in HIV prevention. Qualitative studies have outlined how stigma shapes and is interwoven into AGYW's decisions to use and disclose their use of PrEP to their sexual partners and family members[64]. In settings similar to our study, AGYW have cited that PrEP stigma can derive from HIV-related misconceptions around HIV medications and promoting sexual promiscuity[84]. We observed that PrEP stigma was associated with a 30% increase in PrEP adherence, however, this likely an upper estimate of the effect since our sample was biased by high loss to follow up and we saw lower estimates in our models with imputed data.

Some limitations of this work include the lack of a scale to measure PrEP stigma that was culturally adapted to Kenyan AGYW. We were not able to conduct cognitive interviews to assess potential participants' understanding of the HPSS. While no scales developed for young women initiating PrEP existed at the time of this project launch, other scales of PrEP stigma for priority populations in Kenya have since become available and can be used in future work to validate our findings[85]. Selection bias may be underlying the findings of PrEP stigma and its effect on increased PrEP adherence and continuation in this study. When imputing data for 70% of young women who did not return to their Month 1 visit, our point estimates moved closer to the null and some statistical significance was lost. Additionally, some women may have experienced a loss of a desired pregnancy, and their choices around contraceptive methods may reflect these desires. Some women who did not return to their Month 1 visit could potentially have received PrEP care elsewhere, and we did not account for this in any way.

## CONCLUSIONS

Building on this and previous implementation projects of PrEP for AGYW, evidence suggests that raising the quality of care and improving uptake of FP and continuation of HIV prevention methods require counseling that addresses overlapping stigmas and their impact on health decision-making. Young women face conflicting messaging around their sexual health decisions from multiple angles, surrounding them with societal, familial, and partner-level

expectations of their choices to have or delay sex, when to prevent or carry a pregnancy, to avoid HIV, but not take medications, and to use condoms or not[2–8]. The moral imperative that is placed on young women's sexuality is rooted in intersectional stigma, which further limits their acceptability of and access to essential sexual health services[86]. Together, these themes demonstrate the importance of normalizing sexual health services such as PrEP care, abortion care, and FP choices.

Post-abortion care settings could be an optimal space to integrate stigma-informed counseling to empower young women to choose care that aligns with their needs. In parallel, the role of value-clarification in addressing provider's hesitations to prescribe PrEP to young women is also indispensable in delivering unbiased information and fostering patient-centered care[87]. To address stigma-driven inequities as a critical barrier to providing sexual and reproductive health care, these findings highlight much-needed multilevel interventions to address stigma and optimize health decision-making that provides young women with the tools needed to avoid unintended pregnancy and HIV.

**Table 1. Baseline and follow-up characteristics of AGYW in PrEDIRA II**

| | n/N or Mean (SD) | % or Median (IQR) |
|---|---|---|
| **Baseline** | | |
| Age | | |
| 15-19 | 73/401 | 18.3% |
| 20-24 | 203/401 | 50.8% |
| 25-30 | 124/401 | 31.0% |
| Marital Status | | |
| Single | 111/401 | 28.0% |
| Partnered | 162/401 | 40.9% |
| Married | 123/401 | 31.1% |
| Income Earned in past 12 m | 240 /401 | 60.3% |
| Partner provides financial support | 71/401 | 18.0% |
| New partner in past 3 months | 74/401 | 18.5% |
| Recent sexual partners living with HIV | | |
| Yes | 4/401 | 1.0% |
| No | 150/401 | 37.5% |
| Don't know | 246/401 | 61.5% |
| Sex in the past 3 months | 364/401 | 90.8% |
| Condom usage in past 3 months | | |
| Never | 283/363 | 78.0% |
| Rarely | 27/363 | 7.4% |
| Sometimes | 51/363 | 14.1% |
| Often | 2/363 | 0.6% |
| Type of Family Planning Initiated | | |
| Injectable | 43/401 | 10.7% |
| Implant | 31/401 | 7.7% |
| IUD | 2/401 | 0.6% |
| Oral contraceptive | 44/401 | 11.0% |
| Condoms | 8/401 | 2.0% |
| None | 274/401 | 68.3% |
| Highly effective FP use | 120/401 | 29.9% |
| | | |
| Overall HPSS Score | 2.83 (0.56) | 2.92 (2.46 - 3.23) |
| High PrEP stigma | 117/401 | 29.8% |
| | | |
| ILAS Domain | | |
| Overall Score | 2.5 (0.55) | 2.6 (2.1-2.9) |
| Worries about judgement | 1.9 (0.99) | 1.6 (1.0-2.7) |
| Isolation | 2.4 (1.09) | 2.5 (1.2 – 3.3) |
| Self-Judgement | 2.8 (0.79) | 2.5 (2.6-3.0) |
| Community Condemnation | 4.5 (0.7) | 5.0 (4.0-5.0) |
| High abortion stigma | 93/401 | 23.2% |
| **M1 Follow-Up** | | |
| Self-reported PrEP continuation | 95/114 | 78.5% |
| TFV detected in POC urine assay | 60/114 | 50.0% |

**Table 2. Demographic and Partnership Factors Associated with High Stigma among AGYW in PrEDIRA 2 Research Cohort**

| | Baseline High PrEP Stigma (N=401) | | Baseline High Abortion Stigma (N=400) | |
|---|---|---|---|---|
| | N (%) | RR (95% CI) | N (%) | RR (95% CI) |
| **Baseline Demographics** | | | | |
| Age Group | | | | |
| 15-19 | 25 (34.3%) | 1.33 (0.86, 2.05) | 27 (37.0%) | 1.99 (1.24, 3.21) |
| 20-24 | 59 (29.1%) | 1.13 (0.78, 1.63) | 42 (20.8%) | 1.12 (0.71, 1.78) |
| 25-30 | 32 (25.8%) | REF | 23 (18.6%) | REF |
| Relationship Status | | | | |
| Single w/ no partner | 28 (25.2%) | 0.87 (0.59, 1.27) | 34 (26.1%) | 2.09 (1.26, 3.49) |
| Partnered | 31 (19.1%) | 0.74 (0.52, 1.06) | 35 (21.7%) | 1.7 (1.03, 2.81) |
| Married | 33 (26.8%) | REF | 17 (13.8%) | REF |
| Income earned in past 12 months | | | | |
| Yes | 70 (29.2%) | 0.98 (0.72, 1.34) | 54 (22.6%) | 1.01 (0.59, 1.74) |
| No | 47 (29.8%) | REF | 38 (24.1%) | REF |
| | | | | |
| New sexual partner in past 3 months | | | | |
| Yes | 21 (38.9%) | 1.25 (0.86, 1.82) | 12 (22.2%) | 1.12 (0.54, 2.31) |
| No | 94 (31.1%) | REF | 66 (21.9%) | REF |
| Recent sexual partners living with HIV | | | | |
| Yes | 0 (0%) | * | -- | -- |
| No | 47 (35.1%) | REF | -- | -- |
| Don't know | 68 (31.2%) | 0.89 (0.66, 1.2) | -- | -- |
| Condom usage in past 3 months | | | | |
| Never or rarely | 93 (30.0%) | REF | 78 (25.2%) | REF |
| Sometimes or often | 19 (35.9%) | 1.3 (0.71, 2.4) | 9 (17.0%) | 0.61 (0.28, 1.3) |
| Social Harm in past 3 months | | | | |
| Any Social Harm | 15 (22.4%) | 0.73 (0.46, 1.18) | 22 (32.8%) | 1.56 (1.05, 2.33) |
| None | 102 (30.5%) | REF | 70 (21.0%) | REF |

*Model did not converge due to insufficient data

**Table 3. Association between baseline PrEP stigma and PrEP adherence and continuation among AGYW in the PrEDIRA 2 Research Cohort, by women with M1 follow-up visit and overall**

| | Low Stigma N (%) | High Stigma N (%) | Overall N (%) | RR (95% CI) | aRR* (95% CI) |
|---|---|---|---|---|---|
| **Subset with Month 1 Visit attended (N=114)** | | | | | |
| PrEP adherence at month 1 via TFV detection | | | | | |
| PrEP Stigma Score | 41 (45.6%) | 19 (63.3%) | 60 (50.0%) | 1.41 (1.15, 1.73) | 1.33 (1.07, 1.66) |
| PrEP continuation at month 1 via self-report | | | | | |
| PrEP Stigma Score | 69 (75.8%) | 26 (86.7%) | 95 (78.5%) | 1.11 (1.02, 1.22) | 1.08** (0.995, 1.18) |
| **Scenario 1: With PrEP outcomes assigned for those with missing data as non-adherent and discontinuing (N=401)** | | | | | |
| PrEP adherence at month 1 via TFV detection | | | | | |
| PrEP Stigma Score | 41 (14.4%) | 19 (16.2%) | 60 (15.0%) | 1.11 (0.73, 1.7) | 1.4 (0.91, 2.15) |
| PrEP continuation at month 1 via self-report | | | | | |
| PrEP Stigma Score | 69 (24.3%) | 26 (22.2%) | 95 (23.7%) | 0.86 (0.64, 1.15) | 0.99 (0.73, 1.35) |
| **Scenario 2: With PrEP outcomes assigned for those with missing data as adherent and continuing (N=401)** | | | | | |
| PrEP adherence at month 1 via TFV detection | | | | | |
| PrEP Stigma Score | 235 (82.8%) | 106 (90.6%) | 341 (85.0%) | 1.09 (1.06, 1.14) | 1.07 (1.01, 1.14) |
| PrEP continuation at month 1 via self-report | | | | | |
| PrEP Stigma Score | 262 (92.3%) | 113 (95.6%) | 375 (93.5%) | 1.04 (1.01, 1.06) | 1.03 (0.97, 1.09) |

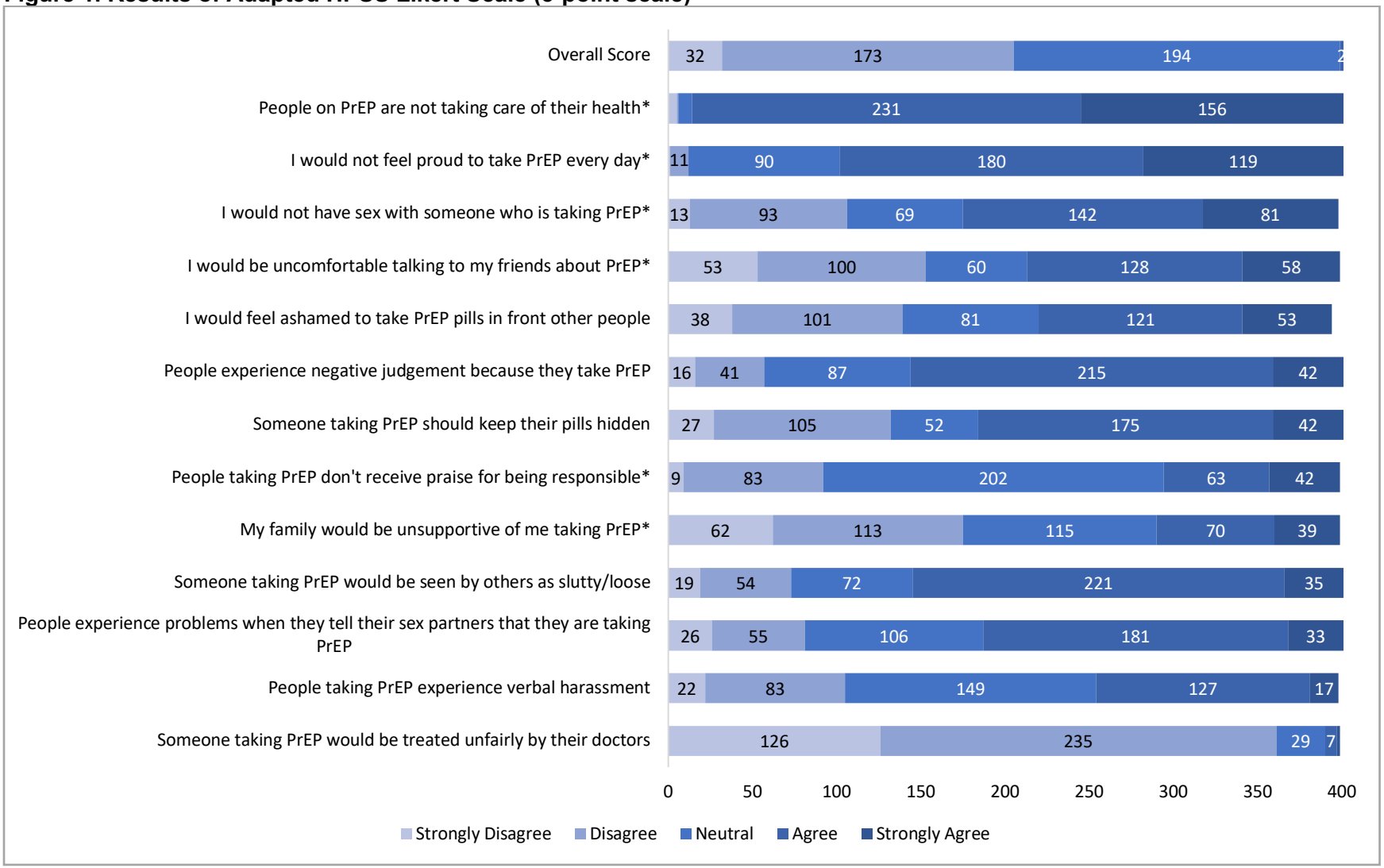
*Adjusted for enhanced arm of PrEDIRA adherence activities and whether the clinic was public or private

**Adjusted for whether the clinic was public or private

**Table 4. Association between Abortion Stigma and Initiation of Highly Effective Contraception among AGYW in PrEDIRA 2 Research Cohort**

| | **Initiated FP Low Stigma N (%)** | **Initiated FP High Stigma N (%)** | **RR (95% CI)** | **aRR* (95% CI)** |
|---|---|---|---|---|
| Overall Score | 87 (28.3%) | 33 (35.5%) | 1.46 (1.18 – 1.81) | 1.48 (1.19 – 1.84) |
| *Subdomains* | | | | |
| Worries about judgement | 90 (30.4%) | 30 (28.7%) | 0.95 (0.81 – 1.1) | 0.94 (0.81 – 1.1) |
| Isolation | 63 (21.7%) | 57 (51.4%) | 1.59 (1.37 – 1.83) | 1.59 (1.38 – 1.84) |
| Self Judgement | 52 (21.8%) | 68 (42.0%) | 1.14 (0.96 - 1.35) | 1.15 (0.96 – 1.36) |
| Community Condemnation | 85 (43.8%) | 35 (16.9%) | 0.83 (0.72 – 0.96) | 0.83 (0.72 – 0.96) |
| *Adjusted for experiences of social harm and whether the clinic was private or public | | | | |

**Figure 1. Results of Adapted HPSS Likert Scale (5-point scale)**




*Changed wording to reflect reverse scores

**Supplementary Material**

**HPSS Likert Scale Revisions**

| | |
|---|---|
| 1. I would feel ashamed to take PrEP pills in front other people<br>2. Someone taking PrEP should keep their pills hidden<br>3. People experience negative judgement because they take PrEP<br>4. I would have sex with someone who is taking PrEP*<br>**5.** Someone taking PrEP would be seen by others as slutty**/loose**<br>6. People taking PrEP receive praise for being responsible*<br>7. ~~My friends would be supportive of me taking PrEP*~~ **I would be comfortable talking to my friends about PrEP***<br>8. Someone taking PrEP would be treated unfairly by their doctors<br>9. People experience problems when they tell their sex partners that they are taking PrEP<br>10. I would feel proud to take PrEP every day*<br>11. People taking PrEP experience verbal harassment<br>12. People on PrEP are taking care of their health*<br>13. My family would be supportive of me taking PrEP* | 1-Strongly disagree<br>2- Disagree<br>3- Neutral<br>4- Agree<br>5- Strongly agree |
| *Reverse coded | |

**ILAS Scale Revisions**

| | | |
|---|---|---|
| Worries about judgement | Around the time of my abortion, I was worried…<br>1. Other people might find out about my abortion<br>2. My abortion would negatively affect my relationship with someone I love<br>3. I would disappoint someone I love<br>4. I would be humiliated<br>5. People would gossip about me<br>6. I would be rejected by someone I love<br>7. People would judge me negatively | 1- Not worried<br>2- A little worried<br>3- Quite worried<br>4- Extremely worried |
| Isolation | Around the time of or since my **pregnancy loss or** abortion…<br>8. I have had a conversation with someone I am close with about my abortion*<br>9. I was open with someone that I am close with about my feelings about my abortion*<br>10. I felt the support of someone that I am close with at the time of my abortion*<br>11. I can talk to the people ~~I am~~ close ~~with~~ **to me** about my abortion*<br>12. I can trust the people ~~I am~~ close **to me** with information about my abortion*<br>13. When I had my abortion, I felt supported by the people I was close with* | 1- Never<br>2- Once<br>3- More than once<br>4- Many times |
| Self Judgement | Around the time of my **pregnancy loss or** abortion, I felt…<br>14. I felt ~~like a bad person~~ **relieved** *<br>15. I felt confident I had made the right decision*<br>16. I felt ashamed about my abortion<br>17. I felt selfish<br>18. I felt guilty | 1- Strongly disagree<br>2- Disagree<br>3- Neutral<br>4- Agree |

| | | |
|---|---|---|
| | | 5- Strongly agree |
| Community Condemnation | **We want to explore community perceptions when a woman chooses to terminate a pregnancy.** How many people in your community held the following beliefs?<br>19. **Self-induced pregnancy loss or** abortion is always wrong<br>20. **Self-induced pregnancy loss or** abortion is the same as murder | 1- No one<br>2- A few people<br>3- About half of people<br>4- Many people<br>5- Most people |
| *Reverse coded | | |

# Chapter 5. Confirmatory factor analysis and validation of the Sexual and Reproductive Empowerment Scale for Adolescents and Young Adults in Kenya

# Confirmatory factor analysis and validation of the Sexual and Reproductive Empowerment Scale for Adolescents and Young Adults in Kenya

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## ABSTRACT

### Purpose
Gender equality and the empowerment of women and girls are critical elements of advancing human rights globally. Understanding the levels of power that adolescent girls and young women are able to exercise in their sexual and reproductive lives is necessary to inform interventions to help them meet their goals.

### Methods
Among a cohort of 500 adolescent girls and young women in Kisumu, Kenya, we tested an adapted version of the Sexual and Reproductive Health Empowerment Scale scale (SRE-K). Utilizing confirmatory factor analysis (CFA), we assessed the factor structure and internal consistency of the domains developed based on theoretical foundations of empowerment and formative qualitative research. To assess construct validity, we utilized logistic regression to evaluate the relationship between empowerment scores and ability to prevent undesired pregnancy.

### Results
Participants had a mean age of 17.5 and most lived with a parent (74%), were students (61%), were currently partnered (94%), and reported having sex in the past 3 months (70%). The final, 26-item CFA model had acceptable fit. All subscales had Cronbach's alpha scores >0.7, and all items had rotated factor loadings >0.5, indicating good internal consistency and robust factor-variable associations. The total SRE-K score was significantly associated with an increased odds of consistent method use (no episodes of sex when method was not used) in past 3 months (adjusted odds ratio: 1.98, 95% CI: 1.29-3.1).

### Conclusions
The SRE-K scale is a newly adapted and valid measure of sexual and reproductive empowerment specific to adolescent girls and young women in an East African setting.


**Key words:** Adolescent; young adult; sexual and reproductive health; empowerment; autonomy; scale adaptation; scale validation

## INTRODUCTION

Gender equality and the empowerment of women and girls has been elevated as a Sustainable Development Goal (SDG), as well as a critical element of advancing human rights globally[88,89]. Kabeer defines empowerment as "the expansion of people's ability to make strategic life choices in a context where this ability was previously denied them"[27]. Theorizing empowerment as both process and outcome is particularly apt for adolescents and young adults, who are experiencing multiple developmental, cognitive, and social processes as they transition into adulthood[90,91]. For many cisgender female adolescents and young adults, to whom we will refer as adolescent girls and young women (AGYW; age 15-24), this transition includes navigating their first sexual and reproductive experiences and decisions. Shaped by gender inequality, societal and social norms and institutions, and interpersonal factors, AGYW's ability to exercise agency in their own sexual and reproductive lives is clearly linked to sexual and reproductive health (SRH) and wellbeing[92–94].

Adolescent girls and young women living in low- and middle-income countries (LMIC) confront unique challenges to SRH access, quality, and wellbeing[95]. Reflecting unequal gendered power dynamics, many AGYW experience forced initiaton of sexual activity, sexual coercion, and intimate partner violence[96,97]. These inequalities contribute to the disproportionate risk of HIV acquisition among AGYW, especially in East and southern Africa[40,98]. Furthermore, the Guttmacher Institute estimates that 50% of pregnancies among adolescents in LMICs are unintended, and unmet need for contraception among AGYW is nearly double that of older reproductive-aged women[99]. While these metrics do not capture the complexity of reproductive desires or experiences among young people, barriers to contraceptive access and use among youth and unmarried women in many settings are well-established[100]. In parallel, complications of pregnancy and childbirth, including those resulting from unsafe abortion[101], are the leading cause of death among 15-19 year-olds globally[102], and adolescents living in sub-Saharan Africa account for 20% of the world's maternal deaths[103]. These stark SRH disparities highlight the need

for tailored, person-centered program and policy development for adolescents and young adults. Yet, despite increasing recognition of gender inequality as a critical determinant of health, there is a gap in knowledge around how to account for differential or limited empowerment among AGYW. Understanding and measuring the levels of power AGYW can exercise in their sexual and reproductive lives is imperative to improving service delivery and meeting their unique needs.

Recent work to re-conceptualize women's and girls' empowerment, especially as it relates to SRH, has emphasized Kabeer's theoretical foundation of resources and agency[89,104], and spurred the development of new measures. Measurement of empowerment and its associations with outcomes such as fertility and contraceptive use has largely relied on proxy measures from surveys, often incorporating education, economic resources, and household decision-making[105–107] that are less germane to youth. Recent measures of empowerment in the SRH context developed in LMIC settings have included AGYW in formative work as well as validation; however, they take a life-course approach and domains span those more relevant to older adults, assuming sexual activity and partnered or married relationship status[108,109].

In contrast, the Sexual and Reproductive Empowerment (SRE) Scale for Adolescents and Young Adults was developed and validated specifically for youth[110]. It contains 23 items that measure seven subscales across the latent construct of sexual and reproductive empowerment among 15–24 year-olds of diverse genders. Grounded in theory specific to young people's sexual and reproductive experiences, the SRE scale focuses on agency in various empowerment domains, such as sexual and reproductive decision-making and communication, sexual safety, sexual pleasure, and future orientation[110]. Among cisgender women in the United States, the SRE scale was associated with increased odds of using one's desired contraceptive method as well as access to SRH information and services. Given that the latent construct of sexual and reproductive empowerment is intertwined with gender and social norms, economic and educational opportunities, and structural factors such as political, legal, and health systems, appropriate adaptation for diverse global contexts is critical. In this paper, we examine the factor

structure and construct validity of the SRE-Kenya (SRE-K) scale, an adapted version of the SRE scale for AGYW in the Kenyan setting.

## METHODS

### Formative qualitative research

We conducted a multi-method qualitative study among Kenyan cisgender AGYW aged 15-23 to adapt the SRE scale items for conceptual and linguistic relevance in Kisumu, Kenya, with methods described elsewhere[111,112]. Formative work, conducted between June-October 2021, was guided by Kabeer's resources-agency-achievements framework [27] and included in-depth interviews to explore key constructs of sexual and reproductive empowerment, expert review, and cognitive interviews. Drawing on published guidance for scale development and adaptation[113], our process ultimately yielded 32 pre-tested items in English, Dholuo, and Kiswahili: these included adapted versions of the original 23 items and 9 new items reflecting emergent domains/sub-domains of empowerment.

### Cross-sectional survey

The current cross-sectional survey, the *EMpowering Adolescent Reproductive health choice and Access* (MARA) study, was conducted in urban and peri-urban Kisumu County, Kenya. Kisumu is the third-largest city in Kenya[114], situated along the shores of Lake Victoria, and is the cultural center of the Luo ethnic group. The region is known for fishing and agricultural industries. Additionally, Kisumu has an HIV prevalence rate of 17.5%, which is three times the national average[115], and has been a hub for HIV prevention research and programming, including the roll-out of pre-exposure prophylaxis[9].

Eligible participants were 15-20 years old; fluent in Dholuo, Kiswahili, and/or English; reported sexual activity with a male partner in the last 12 months; had capacity for pregnancy (non-pregnant and not relying on sterilization for contraception); and stated a desire to avoid pregnancy for at least 6 months. Female study staff recruited participants through research clinic-

and community-based strategies. Our team recruited AGYW participating in an ongoing clinical trial cohort (the KEN SHE trial[116]) at two Kenya Medical Research Institute (KEMRI) clinics. We collaborated with community health volunteers and implementers of DREAMS (Determined, Resilient, Empowered, AIDS-free, Mentored and Safe) programming to recruit AGYW in youth groups, gatherings, and public venues in a variety of neighborhoods and informal settlements[117]. Purposive quota sampling was employed to ensure a balanced age distribution and appropriate representation of 15-17 year-old AGYW.

Data were collected via a private in-person interviewer-administered survey lasting approximately 45 minutes by trained cisgender female staff in Dholuo, Kiswahili, or English. The survey included sociodemographics, sexual and reproductive health history, various measures of interest, and a discrete choice experiment assessing preferences for contraceptive method and service delivery characteristics, in addition to the SRE scale. The survey was administered using SurveyEngine (SurveyEngine GmbH, Berlin, Germany) on a tablet. Likert scale answer choices for each measure were available on laminated cards for participants' reference during the survey. Participants recruited from the community chose to complete the survey at the research clinic or in the field. Participants received 500 Kenyan shillings (~USD$4) to remunerate them for their time.

This research was approved by the KEMRI Scientific Ethics Review Unit (P00181/4367) and the University of Washington Human Subjects Division (00014701). Given the low-risk cross-sectional survey procedures, a waiver of parental consent was approved to prioritize privacy and minimize risk to participants. Participants provided written informed consent or assent.

**Outcome measures**

We developed two outcomes measures to assess validity: 1) consistent contraceptive use in the last 3 months, and 2) desired contraceptive method use. Given that only AGYW who indicated a desire to avoid pregnancy for the next 6 months were eligible for the MARA study, we chose outcomes related to contraceptive use. Our primary validation outcome, chosen *a priori,*

was consistent contraceptive use in the last 3 months among AGYW who reported sex during that period. This dichotomous variable captured whether AGYW reported at least 1 episode of unprotected sex (no method used to prevent pregnancy) in the prior 3 months[118]. We chose this outcome based on our prior qualitative work among adolescents in the region, which suggests that contraceptive behavior among AGYW is dynamic and episodic, as is their ability to negotiate consistent condom use[119]. We hypothesized that AGYW with greater sexual and reproductive empowerment who desire to avoid pregnancy will be more likely to prevent undesired pregnancy through consistent contraceptive use (lack of unprotected sex). We also assessed the use of one's desired contraceptive method. As in Upadhyay *et al.* 2021, each participant was asked "If you could use any contraceptive method, which method would you use?" We then developed a dichotomous variable by comparing their desired and current methods, if any. AGYW whose desired method was "no method" and were not using a current method were considered to be using their desired method. All analyses were conducted in R version 4.2.2 (CRAN.org).

**Statistical analyses**

We first conducted descriptive statistics to characterize participants' sociodemographic characteristics, sexual and reproductive experiences, and other relevant measures (Table 1). The proposed domain structure was developed based on theoretical foundations of empowerment[89] and domains of empowerment that emerged from formative qualitative research findings[27,111]. For the psychometric analysis, we assessed criteria factor structure fit using the *lavaan* package (version 0.6-12) in R 4.2.2 software. Model fit was assessed using the root mean square of approximation (RMSEA), the comparative fit index (CFI), and standard root mean square residual (SRMR). A RMSEA value below 0.05, CFI value of 0.9 or greater, and SRMR below 0.8 were chosen as indicators of good fit for the model[120].

We utilized confirmatory factor analysis (CFA) to evaluate the fit of our proposed factor structure and the loadings of each item onto their respective factors. Given all items had 5-point Likert response categories, CFA was performed with a polychoric correlation matrix of item

responses and weighted least sums estimator, and allowed for domains to be correlated[120]. Negatively worded items were reverse coded so higher scores for all items could be interpreted as indicating a higher degree of empowerment. For the final CFA model, items with a factor loading below 0.4 were dropped[120]. When two items were deemed very similar, we dropped the one with the lower factor loading to reduce items. We calculated descriptive statistics of SRE-K scale scores as a weighted average of the subdomain items, calculated Cronbach's alpha between the full scale and subdomains to test internal consistency, and assessed the correlation matrix of the subdomains to further assess factor structure.

To assess participant characteristics that were associated with the SRE-K, we used multivariate linear regression models to separately model each of the subscales and overall score as continuous outcomes. These models included age, education, living situation, partner status, income, and school status as independent variables. Among participants that were currently partnered, we calculated the age gap between the participant and their partner, utilizing the 75$^{th}$ quartile to dichotomize whether a participant had a significantly older partner. We then used multivariate linear regression models to assess age gap and the overall SRE-K and subscale scores, adjusting for the aforementioned variables. To assess construct validity of the SRE-K scale, we utilized bivariate logistic regression to determine the relationship between SRE scores (total and subscale) and relevant SRH outcomes. Outcomes that were significant at the 0.05 level in the univariate relationship with the overall SRE-K were further adjusted with baseline factors of age, parity, and education.

## RESULTS

From May to December 2022, MARA enrolled 500 AGYW into the research cohort. Participants had a mean age of 17.5 years (standard deviation: 1.42). Most AGYW were recruited from the community (73%), reported living with a parent (74%), and were currently attending school (61%; Table 1). The majority were currently partnered (94%), and received financial or

material support from their partners (87%). The age gap between AGYW and their partners was a median 4 years (interquartile range (IQR): 2-6) Additionally, a majority of AGYW reported having sex in the past 3 months (70%) and, among these, 43.4% had consistently used a contraceptive method during the past 3 months. While 29.3% reported current contraceptive use, only 19.0% of AGYW used their desired method. Well over half of participants reported experiencing intimate partner violence (IPV, 61%). None of the participants were missing any SRE-K items. The categorical responses of each adapted item are presented in Figure 1, displaying the variation of responses among AGYW.

**CFA Model**

When constructing the initial CFA model, the following three items had factor loadings that indicated poor fit to the proposed domains: *"I am afraid of sex*"; *"If I had a sexual partner, I would feel comfortable talking about whether or not I want to have children with them*"; *"I am able to do the things I want to do without worrying about my safety*." Two additional items were dropped on the basis of being similar to other items with higher factor loadings: *"What other people think about methods to prevent pregnancy is less important than what I think and want"*; *"I would be able to say no to sex if I do not want to have sex"* (Supplemental Table 1). The final model had seven domains and was found to have acceptable fit based on the fit indices (RMSEA = 0.050, 90% CI = 0.045–0.056; CFI = 0.962; SRMR = 0.057). All subscales had Cronbach's alpha scores >0.7, and all items had rotated factor loadings >0.5, indicating good internal consistency and robust factor-variable associations. Table 2 presents the final 26 items in the SRE-K scale, as well as the alpha score, median, and IQR. The correlation matrix for the factors had were below 0.5 (Supplemental Table 2), suggesting the subdomains were independent. The sex as choice domain was prominent in the negative or low correlation with all other domains.

**Correlates of SRE-K and subdomain scores**

Several sociodemographic and partnership characteristics had statistically significant associations with SRE subscales. Of note, education (beta: 0.338, p-value: <0.0001; Table 3) was significantly associated with a higher overall SRE-K score, while having male partner who was 6 or more years older (beta: -0.117, p-value: 0.02) was associated with lower overall scores. Currently partnered AGYW had higher sexual pleasure subscale scores (beta: 0.11, p-value: <0.0001). Participants who reported living with a parent (beta: 0.355, p-value: <0.0001) had higher scores in the parental support subdomain, while AGYW who had a large age gap in partnerships (beta: -0.305, p-value: 0.0009) had lower scores in the parental support subdomain.

**Validation**

When assessing construct validity, the overall SRE-K score was significantly associated with an increased odds of consistent method use (adjusted odds ratio (aOR): 1.98, 95% CI: 1.29-3.1, Table 4) among MARA participants who reported recent sex (n=350). An increased odds of consistent method use was also found among the subdomains of choice of partner, marriage, children (aOR: 1.44, 95% CI: 1.08-1.96); parental support (aOR: 1.34, 95% CI: 1.05 -1.72); bodily well-being (aOR: 1.65, 95% CI: 1.11, 2.51), and sex as choice (aOR: 1.41, 95% CI: 1.18, 1.68). The overall SRE-K score was not significantly associated with desired contraceptive use (OR: 1.02, 95% CI: 0.66-1.63).

**DISCUSSION**

We describe the factor structure and psychometric properties of the SRE-K scale, which is the first adaptation of the SRE scale for adolescents and young adults in a LMIC context in the Global South. The SRE-K scale consists of 26 items that mapped to 7 domains, or subscales, with acceptable model fit as suggested by the CFA. We found high internal consistency and robust factor-variable associations. Our findings are strengthened by a foundation of theory-driven

qualitative research, which elicited domains of sexual and reproductive empowerment that were most relevant to Kenyan AGYW, supporting the content validity of the SRE-K.

The SRE-K subscales, or domains of sexual and reproductive empowerment, differ in important ways from the original scale. The CFA supported the creation of 2 new subscales ("care self-efficacy" and "sex as choice"), while other items from some original SRE scale subscales were collapsed. For example, we combined the "self-love" and "sexual safety" domains to create the "bodily well-being" domain, based on conceptual interrelatedness in our formative reserach combined with factor loadings. The new SRE-K domain of "care self-efficacy" incorporates 3 Kenya-specific items, and was not significantly associated with consistent contraceptive use or desired method use. This finding suggests that one's ability to overcome social norms and stigma to access SRH services does not necessarily predict one's ability to avoid pregnancy risk, and future research is needed to explore the relationship between self-efficacy in SRH care-seeking and health outcomes. Notably, few other measures have included agency to seek out SRH services as a component of sexual and reproductive empowerment[107]. Interestingly, two new items developed from our qualitative work that we anticipated would be absorbed into existing subscales stood alone as the "sex as choice" subscale, which was associated with a 40% increase in consistent method use. These items reflect the latent construct of the need to use sex to please or for material benefit. Prior research from Kenya and elsewhere in sub-Saharan Africa has found that it is a common experience for AGYW to engage in sexual relationships, often with much older men, that offer support in the form of basic necessities or school fees[121–123]. The dimensionality of the SRE-K sale suggests that the "sex as choice" domain is a unique construct of empowerment to capture among Kenyan AGYW.

The assessment  of construct validity demonstrated that the full SRE-K scale and several subscales were significantly associated in the expected direction with consistent contraceptive use in the prior 3 months. We chose this outcome *a priori* in order to reflect the ability of AGYW to prevent undesired pregnancy, as it captures episodic contraceptive use better than current or

desired method use in a setting where male condoms and emergency contraception are adolescents' dominant method choices[11,119]. A 1-unit increase in the overall SRE-K score was associated with a 98% increase in odds of consistent method use during the past 3 months. The original SRE scale validation used desired contraceptive method as the validation outcome among AGYW in the US[110], an approach that is consistent with a large body of literature linking empowerment with contraceptive use[124]. In our sample, only 95 of 500 AGYW reported using their desired contraceptive method and this outcome was not significantly associated with the overall SRE-K score. Our participants were young and had less-than-expected contraceptive experience, which may have affected responses to the question about desired methods. The concept and measurement of desired method use among adolescents and youth deserves attention in Kenya and other LMICs. Finally, while we hypothesized that a higher level of sexual and reproductive empowerment among AGYW is associated with consistent contraceptive use among those who want to avoid pregnancy, we do not assume that contraceptive use is "good" or "empowered" for all adolescents. As Holt *et al.* assert, "equating contraceptive use with…success is fundamentally flawed"[125]. Emerging constructs and measures around preference-aligned fertility management[125] and contraceptive autonomy[126] are critical aspects of understanding the contraceptive choices and needs of AGYW, and may further delinate how their needs contrast those of older adults.

While several other empowerment measures exist and include women younger than 25 years old in the validation process[109,127], the original SRE scale is unique in its focus on adolescents and young adults[128]. Our analysis centers 15-20 year-olds, responding to the underrepresentation of younger AGYW in research due to the ethical and implementation challenges inherent to including minors[129]. Our choice of age-range also reflects our specific interest in this younger population's sexual and reproductive empowerment and needs, which may diverge somewhat from young adults'. However, while young women aged 21 to 24 were not included in the validation study, they were included in the qualitative work and cognitive interviews and their perspectives are appropriately represented in the adapted SRE-K scale items. Of note,

while most participants reported sexual activity in the prior 3 months, and stated a desire to avoid pregnancy, a minority reported current contraceptive use. This finding underscores the significant barriers to contraceptive use among adolescents[130], as well as the need for more nuanced measures of pregnancy ambivalence and acceptability in this age group. In light of the stigma associated with both pregnancy and contraceptive use among adolescents in this setting[119], social desirability bias may have affected self-report of both fertility desires and contraceptive use.

This study has limitations. The study was cross-sectional and longitudinal data are needed to examine development trajectories and causal pathways of empowerment over time[131,132]. Additionally, participants were enrolled from a single region of Kenya, tended to still be attending school and living with their parents, and just over a quarter (26%) were participants in a clinical trial where they had frequent access to free contraceptive counseling and methods; our findings may not be generalizable to other subgroups of young Kenyan women. We were limited to convenience sampling given the need to recruit AGYW in a non-household setting due to the sensitive nature of the research; however, our community-based sampling successfully recruited AGYW from various economic and social backgrounds, from the urban center of Kisumu to periurban informal settlements. This study included cisgender AGYW with prior sexual activity with male partners only, and does not represent boys, men, transgender or nonbinary individuals, or people of diverse sexual orientations. Future work is needed to include adolescent boys and young men as well as sexual and gender-diverse communities in adaptations of this and other measures of empowerment.

The SRE-K scale measures the multidimensional construct of sexual and reproductive empowerment among AGYW in Kenya, grounded in young people's lived realiites. This measure may be a valuable tool for researchers, program implementers, and program evaluators in SRH, HIV prevention, and maternal child health to illuminate specific groups of adolescents' and young adults' experiences and needs, and to adjust service delivery in meaningful ways. For example, measurement of sexual and reproductive empowerment could shed new light on challenges to

pre-exposure prophylaxis for HIV prevention adherence[133] and persistence among adolescents, or be used to help design contraceptive service delivery that is more person-centered[134] and responsive to AGYW with limited empowerment. The SRE-K score could also be used as an outcome measure, evaluating the impact of programs aimed at enhancing sexual and reproductive empowerment or contraceptive autonomy. While the SRE-K was adapated for and validated in Kenya, it is likely more applicable to other contexts in East and southern Africa, and possibly other LMICs, compared to measures validated in the US or Europe. Future research is needed to replicate these findings in new populations, assess associations of empowerment with SRH outcomes, and further adapt the measure for varied gender identities and settings.

**IMPLICATIONS AND CONTRIBUTION**

The SRE-K scale is a newly adapted and validated multidimensional measure of sexual and reproductive empowerment specific to adolescent girls and young women in an East African setting. To advance SRH service delivery for youth, future research in global health will benefit from including measures of empowerment to tailor programmatic efforts, improving the person-centeredness of SRH care, and to measure the success of SRH programs.

**Table 1. Demographic Characteristics of MARA participants (N=500)**

| | N(%) |
|---|---|
| **Age** | |
| Mean (SD) | 17.5 (1.42) |
| Median [Min, Max] | 18.0 [15.0, 20.0] |
| **Recruitment Strategy** | |
| Clinical trial cohort | 133 (26.6%) |
| Community-based | 367 (73.4%) |
| **Education** | |
| Primary, complete or less | 38 (7.6%) |
| Secondary, not complete | 303 (60.6%) |
| Secondary, complete | 135 (27.0%) |
| Post-Secondary | 24 (4.8%) |
| **Ethnicity** | |
| Luo | 442 (88.4%) |
| Luhya | 39 (7.8%) |
| Other | 20 (0.4%) |
| **Religion** | |
| None | 4 (0.8%) |
| Christian | 465 (93.0%) |
| Muslim | 10 (2.0%) |
| African traditional | 21 (4.2%) |
| **Still attending school** | |
| No | 193 (38.6%) |
| Yes | 307 (61.4%) |
| **Earned own income in last 12 months** | |
| No | 414 (82.8%) |
| Yes | 86 (17.2%) |
| **Lives with parent/guardian** | |
| No | 129 (25.8%) |
| Yes | 371 (74.2%) |
| **Currently has a primary partner** | |
| No | 32 (6.4%) |
| Yes | 468 (93.6%) |
| **Partner age** (n=468) | |
| Mean (SD) | 21.7 (3.31) |
| Median [Min, Max] | 21.0 [14.0, 38.0] |
| **Partner provides financial/material support** (n=468) | |
| No | 33 (6.6%) |
| Yes | 435 (87.0%) |
| **Sex in last 3 months** | |
| No | 150 (30.0%) |
| Yes | 350 (70.0%) |
| **Has experienced IPV** | |
| No | 196 (39.2%) |
| Yes | 304 (60.8%) |
| **Current contraceptive use** | |
| No | 354 (70.8%) |
| Yes | 146 (29.2%) |

| | |
|---|---|
| **Using desired contraceptive method** | |
| No | 405 (81.0%) |
| Yes | 95 (19.0%) |
| **Consistent method use in prior 3 months** (n=350) | |
| No | 198 (56.6%) |
| Yes | 152 (43.4%) |
| Abbreviations: IPV, Intimate partner violence; SD, standard deviation | |

**Figure 1. Responses to adapted items among AGYW in Kenya**

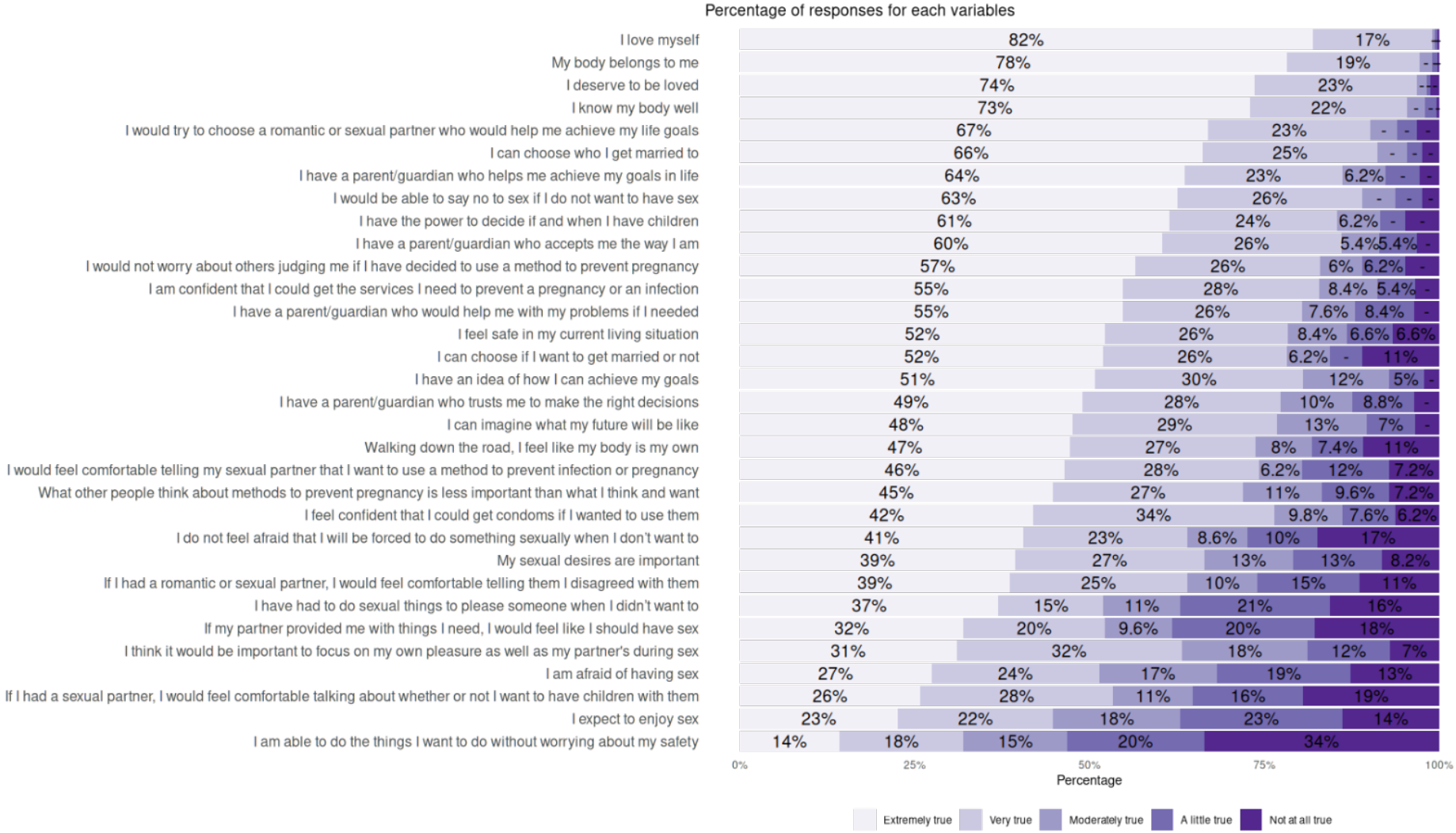

**Table 2. The final SRE-K items and their corresponding rotated factor loadings across the seven subscales**

| Domain | Alpha | Median (IQR) | Original or New | Item | Factor Loadings |
|---|---|---|---|---|---|
| Bodily well-being | 0.76 | 4.67 (4.17-5.0) | O | 1. Walking down the road, I feel like my body is my own. | 0.51 |
| | | | O | 2. I love myself. | 0.93 |
| | | | O | 3. I deserve to be loved. | 0.78 |
| | | | O | 4. I know my body well. | 0.79 |
| | | | O | 5. My body belongs to me. | 0.86 |
| | | | O | 6. I feel safe in my current living situation. | 0.69 |
| Choice of partners, marriage, children | 0.77 | 4.33 (3.83-4.83) | O | 1. If I had a sexual partner, I would feel comfortable telling that person if I wanted to use a method to prevent infection or pregnancy, even when they didn't want to. | 0.67 |
| | | | O | 2. If I had a romantic or sexual partner, I would feel comfortable telling them I disagreed with them. | 0.57 |
| | | | O | 3. I can choose if I want to get married or not. | 0.57 |
| | | | O | 4. I can choose who I get married to. | 0.81 |
| | | | O | 5. I have the power to decide if and when I have children. | 0.74 |
| | | | N | 6. I would try to choose a romantic or sexual partner who would help me achieve my life goals. | 0.66 |
| Care self-efficacy | 0.78 | 4.33 (3.67 - 5.0) | N | 1. I am confident that I could get the services I need to prevent a pregnancy or an infection. | 0.76 |
| | | | N | 2. I would not worry about others judging me if I have decided to use a method to prevent pregnancy. | 0.70 |
| | | | N | 3. I feel confident that I could get condoms if I wanted to use them. | 0.65 |
| Parental support | 0.79 | 4.5 (4.0-5.0) | O | 1. I have a parent/guardian who would help me with my problems if I needed. | 0.83 |
| | | | O | 2. I have a parent/guardian who accepts me the way I am. | 0.86 |

| | | | | | |
|---|---|---|---|---|---|
| | | | O | 3. I have a parent/guardian who trusts me to make the right decisions. | 0.83 |
| | | | O | 4. I have a parent/guardian who helps me achieve my goals in life. | 0.87 |
| Sense of future | 0.78 | 4.5 (3.5-5.0) | O | 1. I can imagine what my future will be like. | 0.74 |
| | | | O | 2. I have an idea of how I can achieve my goals. | 0.81 |
| Sex as choice | 0.85 | 3.5 (2.0-4.5) | N | 1. If my partner provided me with things I need, I would feel like I should have sex.* | 0.84 |
| | | | N | 2. I have had to do sexual things to please someone when I didn't want to.* | 0.70 |
| Sexual pleasure | 0.78 | 3.67 (3.0-4.33) | O | 1. My sexual desires are important. | 0.84 |
| | | | O | 2. I think it would be important to focus on my own pleasure as well as my partner's during sex. | 0.74 |
| | | | O | 3. I expect to enjoy sex. | 0.60 |
| Overall SRE-K | 0.72 | 4.19 (3.85 - 4.5) | | 26 items | |

Abbreviations: O, Original; N, New
*Reverse coded items

**Table 3. Beta coefficients from multivariable models of participant characteristics, by SRE-K overall and subscale scores**

| | Bodily well-being (n = 500) | Choice of partners, marriage, children (n = 500) | Care self-efficacy (n = 500) | Parental support (n = 500) | Sense of future (n = 500) | Sex as choice (n = 500) | Sexual pleasure (n = 500) | Overall SRE-K (n = 500) |
|---|---|---|---|---|---|---|---|---|
| ***Age, per year increase*** | -0.006 | 0.025 | 0.057* | -0.001 | -0.029 | 0.106* | 0.079 | 0.026 |
| ***Completed primary education*** | | | | | | | | |
| *Yes* | 0.185* | 0.430** | 0.309* | 0.470** | 0.243 | 0.733** | 0.110 | 0.338*** |
| *No (ref)* | - | - | - | - | - | - | - | - |
| ***Living situation*** | | | | | | | | |
| *With parent* | 0.092* | -0.009 | 0.069* | 0.355*** | 0.131 | 0.037 | -0.019 | 0.092 |
| *Not living with parent (ref)* | - | - | - | - | - | - | - | - |
| ***Partner status*** | | | | | | | | |
| *Has primary partner* | -0.125* | -0.075 | 0.341* | -0.063 | -0.076 | -0.514* | 0.774*** | 0.027 |
| *Non-partnered (ref)* | - | - | - | - | - | - | - | - |
| ***Income*** | | | | | | | | |
| *Earned income in last 12 months* | -0.048* | -0.007 | 0.146 | -0.337** | -0.215 | -0.425* | 0.186 | -0.076 |
| *No income* | - | - | - | - | - | - | - | - |
| ***School status*** | | | | | | | | |
| *Currently attending school* | 0.017 | -0.051 | -0.109 | 0.049 | 0.072 | -0.419** | 0.085 | -0.030 |
| *Not in school* | - | - | - | - | - | - | - | - |
| ***Age Gap~*** | | | | | | | | |
| *≥ 6 years* | -0.154** | -0.054 | 0.086 | -0.305** | -0.136 | -0.035 | -0.165 | -0.117* |
| *< 6 years (ref)* | - | - | - | - | - | - | - | - |

*Significant at p-value <0.05, ** 0.01, *** <0.001

~ Subset of women who were partnered (n=466). Model included participant's age, education, living status, income, and school status.

**Table 4. Associations between weighted SRE-K overall score and subdomain scores with contraceptive use outcomes**

| | Consistent contraceptive use in the last 3 months (n=350) | | | | Using desired method (n=500) | |
|---|---|---|---|---|---|---|
| **Domain** | **OR (95% CI)** | **p-value** | **aOR (95% CI)** | **p-value** | **OR (95% CI)** | **p-value** |
| SRE-K overall score | 1.91 (1.26, 2.96) | *0.004* | 1.98 (1.29, 3.1) | *0.002* | 1.02 (0.66, 1.63) | 0.9 |
| Bodily well-being | 1.59 (1.07, 2.4) | *0.02* | 1.65 (1.11, 2.51) | *0.02* | 0.97 (0.64, 1.49) | 0.87 |
| Care self-efficacy | 1.12 (0.86,1.46) | 0.39 | 1.11 (0.85, 1.45) | 0.46 | 1.23 (0.93, 1.65) | 0.15 |
| Choice of partners, marriage, children | 1.44 (1.08, 1.94) | *0.01* | 1.44 (1.08, 1.96) | *0.02* | 0.96 (0.71,1.3) | 0.78 |
| Parental support | 1.29 (1.02, 1.65) | *0.04* | 1.34 (1.05, 1.72) | *0.02* | 0.87 (0.69, 1.12) | 0.27 |
| Sense of future | 1.21 (0.96, 1.54) | 0.11 | 1.23 (0.97, 1.57) | 0.09 | 0.97 (0.76, 1.25) | 0.8 |
| Sex as choice | 1.38 (1.17, 1.63) | *0.0001* | 1.41 (1.18, 1.68) | *0.0001* | 1.07 (0.9, 1.27) | 0.45 |
| Sexual pleasure | 0.97 (0.79, 1.19) | 0.77 | 0.97 (0.78, 1.20) | 0.76 | 1.08 (0.87, 1.35) | 0.5 |

**Supplemental Table 1. Dropped SRE-K items and their corresponding rotated factor**

| Domain | Original or New Item | Dropped Item | Factor Loadings |
|---|---|---|---|
| Bodily well-being | O | I do not feel afraid that I will be forced to do something sexually when I don't want to. | 0.55 |
| | Rationale for dropping: Double-negative sentence structure, and somewhat duplicative with "sex as choice" item *I have had to do sexual things to please someone when I did not want to* with a lower factor loading. | | |
| Choice of partners, marriage, children | O | If I had a sexual partner, I would feel comfortable talking about whether or not I want to have children with them. | 0.36 |
| | Rationale for dropping: factor loading <0.4. | | |
| Care self-efficacy | N | What other people think about methods to prevent pregnancy is less important than what I think and want. | 0.65 |
| | Rationale for dropping: Similar to *I would not worry about others judging me if I have decided to use a method to prevent pregnancy* and with lower factor loading. | | |
| Sexual pleasure | O | I am able to do the things I want to do without worrying about my safety. | 0.33 |
| | Rationale for dropping: factor loading <0.4. | | |
| | N | I would be able to say no to sex if I do not want to have sex. | 0.72 |
| | Rationale for dropping: Was less conceptually cohesive with domain; more relevant to "sex as choice" domain but similar to *I have had to do sexual things to please someone when I did not want to* with a lower factor loading. | | |
| | N | I am afraid of having sex.* | -0.13 |
| | Rationale for dropping: factor loading <0.4; inversely correlated with subscale. | | |

Abbreviations: O, Original; N, New
*Reverse coded items

**Supplemental Table 2. Correlation matrix of SRE-K latent variables**

| | Bodily well-being | Choice of partners, marriage, children | Care self-efficacy | Parental support | Sense of future | Sex as choice | Sexual pleasure |
|---|---|---|---|---|---|---|---|
| Bodily well-being | 1.0 | | | | | | |
| Choice of partners, marriage, children | 0.50 | 1.0 | | | | | |
| Care self-efficacy | 0.36 | 0.41 | 1.0 | | | | |
| Parental support | 0.47 | 0.33 | 0.25 | 1.0 | | | |
| Sense of future | 0.45 | 0.37 | 0.26 | 0.42 | 1.0 | | |
| Sex as choice | -0.03 | -0.01 | -0.12 | 0.14 | -0.001 | 1.0 | |
| Sexual pleasure | 0.31 | 0.35 | 0.42 | 0.16 | 0.26 | -0.27 | 1.0 |

# Chapter 5. Discussion

This body of evidence contributes a larger understanding of the constellation of young women's experiences of systems, stigma, and empowerment in sexual and reproductive health care settings, and highlights keys areas to address in order to raise the quality of care that they receive. Few studies have explicitly focused on structural and social factors as determinants of success in delivering comprehensive sexual and reproductive health services. Utilizing data from an implementation science project delivering PrEP to young women in post-abortion care settings in Kenya, we report the first results of the PrEP program and the psychosocial experiences at this intersection of HIV prevention and family planning. We also applied data from a cross-sectional cohort of young women who desired to avoid pregnancy to assess and validate an adapted measure of sexual and reproductive empowerment for Kenyan AGYW. Leveraging behavioral science frameworks, this research brings multidisciplinary epidemiologic perspective in the real-world settings of PrEP and FP delivery and provides a scope to inform the provision of future research.

This work was built on the foundation of a systematic review in which we assessed the psychosocial status of adolescent girls and young women after an abortion, globally and with a focus in Africa[76]. In evaluating the themes that arose from 38 articles reviewed (6 in Africa), we found that navigating abortion as an adolescent or young woman involves managing internalized and perceived stigma, fear of violence, secrecy, and growing resilient to overcome the significant barriers that society and culture place on access to an essential service for sexual and reproductive health. These psychosocial outcomes highlight the need for support services and investigation of contexts that perpetuate and necessitate unsafe abortion. Empowerment of adolescent girls and young women is an important opportunity to build self-agency and positive coping mechanisms to withstand social pressures during stigmatizing circumstances associated with abortion. We also considered how few quantitative measures of psychosocial experience were captured in these reproductive health care settings and sought to fill this gap through quantitative measurement of stigma and empowerment in Chapters 3 and 4.

**Improving the structural context for reproductive health service delivery**

Improving access to and quality of healthcare are critical investments in order to cultivate comprehensive HIV prevention and sexual health services tailored for young women. To meet the needs of young women for PrEP and FP coverage, comprehensive sexual health service delivery points must utilize the spaces and personnel that are congruent with AGYW's values and preferences. While many studies have examined individual risk behavior and decision-making in relationship with PrEP, few research studies have considered the system in which young women access sexual health services and how this influences its use. In Chapter 2, we've described key hurdles to the successful delivery of PrEP in abortion settings, including supply chain issues and human resource shortages. Reducing these challenges would lead to fewer bottlenecks and greater services for key populations for HIV prevention, as echoed by other projects in Africa[28–30]. Operationalizing comprehensive sexual health services requires establishing linkages with referral networks and offering differentiated service delivery options depending on a client's needs[30]. Expanding potential referral options for continuation and re-initiation of PrEP would involve a diverse set of locations for accessing care. Pharmacies and drug shops throughout Kenya have been leveraged for years to improve upon low levels of FP access and successfully reaching hard-to-reach population such as young, unmarried women[135]. PrEP models of delivery are also adding pharmacy-based access points to address constraints on human resources in healthcare[136]. Pharmacies and drug shops may be ideal settings for refills and re-initiation among young women who continually or intermittently seek PrEP and/or FP. Other community-based models of care that are tailored to reach AGYW include hair salons, mobile health clinics, peer-based groups, and youth friendly clinics[137–140]. Diversifying and saturating options for young women to access comprehensive PrEP and FP services are key paths to increasing access to and normalizing sexual and reproductive health services[9,30].

**Improving the social context for reproductive health service delivery**

Mitigating stigma is a chief concern for AGYW, particularly those seeking sexual health services[26,141,142]. Within the context of social norms imposed on AGYW, social desirability surrounding sexual activity poses difficulty in asking sexual behavior questions to inform the process of PrEP and FP initiation among AGYW[143–145]. To meet the coverage needs for PrEP and/or FP, engaging AGYW in health systems requires eliminating stigma from sexual and reproductive health counseling and nurturing value-congruent choices and tools.

A current gap exists in identifying modifiable psychosocial factors that improve initiation and continuation of PrEP and FP and can be incorporated into patient-centered counseling. Enhancing adolescent-friendly services to incorporate counseling on mental health and wellbeing is key to facilitating positive interactions between youth and their providers[146]. In Chapter 3, we've evaluated the burden and effect of stigma on FP and PrEP decisions. When measured quantitatively, we found a high level of PrEP stigma and abortion stigma among young women initiating PrEP in abortion settings. As described in Chapter 3, the complexity of roles that stigma may play in sexual health decision-making point to the interlocking factors that need addressing in counseling discussions with providers. Similar approaches can be utilized for contraceptive counseling and initiation after an abortion, as motivational interviewing can be utilized to increase self-efficacy in contraceptive uptake after an abortion. Building on self-efficacy, assessing adolescent empowerment may illuminate adolescents' sexual and reproductive health needs and experiences and serve as entry points to improve service delivery that incorporates such conversations. In Chapter 4, we've employed psychometric evaluation to gauge the factor structure of an adapted measure of empowerment among young women in Kenya, and established construct validity in determining that higher empowerment scores were associated with 98% increase in consistent method use. Research focused on family planning, HIV and sexually transmitted infection (STI) prevention and treatment, and maternal and child health may benefit from utilizing such tools to capture stigma and empowerment. In this way, eradicating

stigma and promoting informed decision-making in turn shifts the motivations for PrEP and FP use to AGYW and can improve retention in care[86,147].

Building critical consciousness around sexual risk can garner informed decision making and improve the ability for providers to step into action with comprehensive sexual health services. In counseling discussions, young women's responses to HIV risk perception or pregnancy intentions may present opportunities to develop sexual and reproductive health knowledge and modify self-perceived risk to improve PrEP and FP uptake and retention. Informed decision-making with the support of patient-facing tools or additional HIV/STI testing can further empower young women to recognize risk and improve PrEP use as needed. Along with youth-friendly service, decision making supported with HIV self-testing can additionally motivate PrEP use[148]. Self-perceived risk can shift as relationships become more stable, concurrently forming trust and discontinuing condom use[149]. Drug-level feedback may be an effective approach for AGYW to better align their self-perceptions with PrEP continuation and discontinuation over time, especially if point-of-care[150,151]. Point-of-care tests and at-home drug adherence tests are novel tools for AGYW to more easily and readily monitor their adherence level to inform sexual decision-making and continue PrEP use, when needed, within the myriad of other relationship concerns. In Chapter 3, we utilized a point-of-care measure of urine tenofovir adherence and found that 50% of young women had adherence to PrEP among those that attended their month 1 follow-up visit. Further work is needed to assess whether alignment of sexual partnership characteristics and PrEP adherence and continuation are improved with point-of-care testing and counseling.

Fostering trust and open communication with a provider is foundational to creating a safe environment for discussing sexual activity and potential for risk. Provider bias has been found as factor limiting PrEP prescription to marginalized groups, thereby driving disparities within those with an acute need for sexual health counseling and services[152]. In South Africa, providers expressed that PrEP would cause adolescent girls and young women to take more sexual risks, i.e., risk compensation, and the reductions in condom use accompanying PrEP uptake would

increase STIs and unintended pregnancy[153]. In Kenya, stigma surrounding provision of contraception for young, unmarried women is also prevalent among abortion providers[154]. In a qualitative study in Kenya, women suspected of self-inducing an abortion reported that interactions with providers were hostile, rude, and disparaging, whereas women with spontaneous abortion reported receiving supportive counseling from their providers[80]. Healthcare providers have the potential to be agents of change, and aligning motivations for providing care with their hesitations toward PrEP and FP provision may overcome these challenges[155]. Further, conversations with healthcare providers must incorporate the reproductive justice principle that healthy sexuality and pleasure are essential components to a whole and full human life[31]. Addressing stigma within sexual and reproductive healthcare requires investments in training providers in stigma-informed counseling and value-clarification.

Together, these findings urge the global health community to incorporate the structural and social (stigma and empowerment) conditions of young women into the delivery of PrEP and family planning services. The clinical context in which these services are delivered need to also be stabilized, expanded, and diversified to meet young women where they are, and not where we expect them to be. Counseling that incorporates both stigma-reducing and empowering messaging for young women is greatly needed to address barriers to adoption of and persistence with HIV prevention and contraceptive methods.

**Future directions to amplify the status of women**

The World Health Organization recommends the horizontal integration of HIV prevention services with family planning and sexual health services. For FP coverage, current progress toward the United Nations 2030 Sustainable Development Goals for access to sexual health services leaves out 218 million women who want to avoid pregnancy but are not using a modern method and results in 97 million unintended pregnancies. Accelerating progress would lead to 41 million fewer women with an unmet need for modern methods and 14 million fewer unintended

pregnancies in 2030[156]. In terms of HIV prevention needs, 670,000 people acquired HIV in the 2020 in East and southern Africa, with an estimated 58% of those incident infections among women and girls[157]. In 2021, UNAIDS reported that nearly 1 million people had ever used PrEP in East and southern Africa, accounting for the bulk of PrEP prescriptions in Africa[40]. Nevertheless, driving down HIV incidence requires multi-method prevention packages, including PrEP, post-exposure prophylaxis, HIV testing with partners, and condoms. Comprehensive sexual health services need strengthening as a pathway to increase both PrEP and FP coverage for sexually active young women in Africa and beyond[9,158]. To accelerate progress toward goals set forth by World Health Organization, United Nations, and UNAIDS, we must recognize the centrality of sexual and reproductive health to overall wellbeing and curb the siloed approaches that restrict service delivery[159].

Placing young women's needs at the center of programs and interventions challenges the paradigms that we operate in as a global community. We contextualize our recommendations within the myriad of socioecological conditions of young women that require attention, including poverty, access to care, experiences of intimate partner violence, and sociopolitical harms, and that limit women's ability to achieve sexual health wellness[160]. Historically, criminalization of abortion and access to sexual health services have been rooted in constructs of white supremacy, and have forced severe consequences upon Black, Indigenous, and other marginalized women[161,162]. Limiting communities' access to sexual health services perpetuates cycles of harm, and results in psychosocial and economic disparities[163]. We currently await additional legal restrictions on medication abortion in America, despite the mounting evidence for abortion and sexual health as essential components to healthier communities. The loss of decision making and power over reproductive capacity and wellness must be addressed as sociopolitical issues that the medical and public health community are engaged in. Global governance surrounding access to sexual health services needs to incorporate these axes of discrimination and oppression in order to overcome the aggregate impacts of reproductive health disparities and gender inequities.

As we interrogate the conditions that shape our current collective reproductive health, the broad and intersecting social and structural spheres of influence point to the frameworks required to make deliberate shifts in policy and practice. While the human rights approach is rooted in individual rights to sexual health services, the justice approach further considers the surrounding conditions that promote or impede on one's reproductive freedom[160]. The healing justice framework further expands to intervene and respond to systemic oppression and build community-led resiliency to sustain emotional, physical, spiritual, and environmental wellbeing[164]. Together, these frameworks invite and accelerate progress toward gender equity through holistic, community-driven approaches to center and engage young women in care. Applying these frameworks to comprehensive sexual health services would accelerate progress toward reducing stigma, building empowerment, and assembling systems that sustain us.

**Conclusions**

Findings from this dissertation advance our understanding of the interlocking factors that need to be addressed in order to improve PrEP and FP uptake and continuation in the coming years. Tailored, person-centered strategies to address gaps in reproductive healthcare are key to delivering transformative care to marginalized communities. In this space, considerations for integrating stigma-reducing and empowering messaging in tandem with addressing the systemic roadblocks to sexual health service delivery are paramount to improving equitable access to care. We found that consistent FP use is associated with increases in empowerment scores, and that FP initiation after an abortion may be improved if abortion stigma is mitigated. We also observed that PrEP stigma is common among young women, and found little evidence that PrEP stigma affected PrEP continuation or adherence at follow-up visit occurring 1 month after PrEP initiation. Future research is needed to develop PrEP stigma scales specific to young women in communities in Africa. We also reported that PrEP service delivery is limited by commodities supply chain issues, differences in private and public settings, and human resources specific to

PrEP counseling and dispensing. Driven by justice and equity, the broader analysis of power and resource distribution requires deliberate shifts in our lens to consider the upstream factors that affect sexual and reproductive health care. As global PrEP rollout continues and expands to include novel interventions such as new PrEP formulations, single-dose human papilloma virus vaccinations, and STI post-exposure prophylaxis, there exist opportunities to realize advances in social and structural conditions that facilitate successful delivery of care for young women.

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