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A socio-ecological approach to understanding experiences and perceptions of a multilevel HIV prevention intervention: The determined, resilient, empowered, AIDS-free, mentored, and safe (DREAMS) partnership in uMkhanyakude, KwaZulu-Natal, South Africa

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1. Introduction

South Africa (SA) has an estimated 7.7 million people living with HIV – the highest number of any country globally; HIV remains the leading cause of death. Despite highly efficacious and cost-effective HIV prevention tools, HIV incidence has remained high, especially amongst adolescent girls and young women (AGYW). In sub-Saharan Africa, AGYW aged 15–24 years account for one in five new HIV infections, despite being just 10% of the population (UNAIDS, 2019). High levels of HIV infection among AGYW have been attributed to gender-based violence (Dellar, Dlamini, & Karim, 2015; Geary, Webb, Clarke, & Norris, 2015; Karim et al., 2014); limited access to youth-friendly health services; stigma (Strauss, Rhodes, & George, 2015); and, more broadly, to a social context where gender disparities and inequity in access to education disadvantage AGYW. In addition, risky behaviours including age-disparate partnerships, discriminatory cultural norms, inconsistent condom use, and increased alcohol consumption persist (MacPherson, Richards, Namakhoma, & Theobald; Maughan-Brown, Kenyon, & Lurie, 2014; PEPFAR, 2018; Pettifor et al., 2008). There are, furthermore, economic, political and structural factors that increase susceptibility to HIV infection and undermine prevention and treatment efforts among this group (Bhana, 2017; Cooper, De Lannoy, & Rule, 2015, p. 60).

It is against this backdrop that the Determined, Resilient, Empowered, AIDS free, Mentored and Safe (DREAMS) partnership implemented an emergency HIV public health response for AGYW using a multi-level HIV prevention intervention (Subedar et al., 2018). The DREAMS approach offered AGYW a package of 'layered' evidence-based social and biomedical interventions, addressing the structural drivers that directly and indirectly increase AGYW HIV risk, strengthen their families, mobilize communities for change and reduce the risk from men who are sex partners of AGYW (PEPFAR, 2018; Saul et al., 2018) (Fig. 1). Linked to the DREAMS core package of interventions is a logic model representing the DREAMS theory of change (ToC). The guiding principle for the ToC was that when AGYW receive multiple, layered interventions

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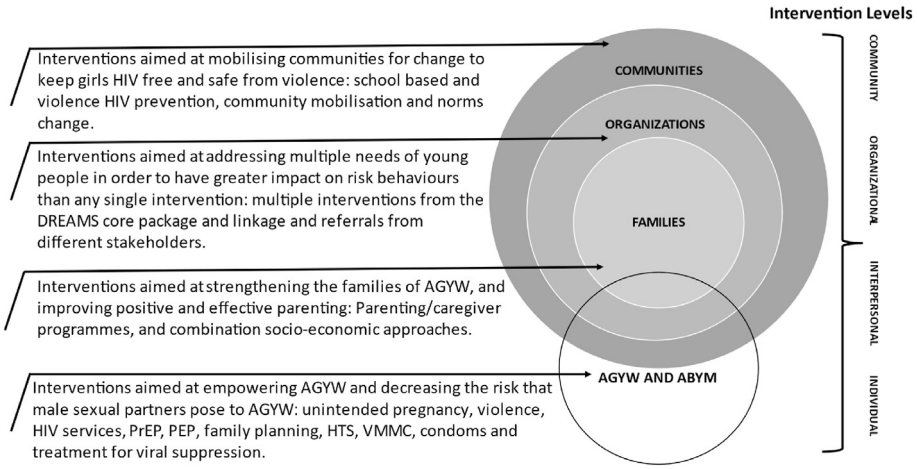

Fig. 1. Socioecological model presenting multi-level domains in the DREAMS core package of interventions.

from the core package, those interventions address a myriad of AGYW's needs and thus have greater impact on risk behaviours than single interventions (Chimbindi et al., 2020; Cluver et al., 2019; Saul et al., 2018).

In uMkhanyakude district of KwaZulu-Natal in South Africa, the DREAMS intervention was implemented between April 2016–September 2018. According to previous studies in this setting, the layering approach required multiple implementing partners (IPs) to collaborate to provide a package of services (Chimbindi et al., 2020; Saul et al., 2018). IPs were contracted by the DREAMS partnership and the US Agency for the International Development (USAID) and selected through a competitive bid (Chimbindi et al., 2020). The IPs worked together with various South African government departments: Department of Social Development, Department of Health (DoH) and the Department of Education. Some of the interventions were provided by local community-based organisations (CBOs) sub-contracted by the IPs (Chimbindi et al., 2020; Gourlay et al., 2019). In this setting, a study investigating awareness and uptake of any and multiple ('layered') DREAMS interventions (Gourlay et al., 2019) found that at a population level, amongst AGYW, uptake of DREAMS interventions and in particular layering of the core interventions was high. This was especially the case with younger AGYW who were still in school. Whilst this was associated with increased uptake of HIV testing, the study did not find a reduction in HIV incidence or sexually transmissible HIV (Gourlay et al., 2019).

The socioecological model is described using multilevel domains presented in the DREAMS approach (Fig. 1) to understand participants experiences of and perceptions about DREAMS intervention components. Multilevel interventions acknowledge that vulnerability of AGYW to HIV is affected by multiple sectors that cut across different levels in the community context, including individual behaviour, families, institutions, programs, and policies (Global Fund, 2019). Using the socioecological model: we explore individual level perceptions and experiences of HIV services and safe spaces for social support; examine family-focused perceptions and experiences around interventions designed to strengthen parent-child communication and promote healthy relationships; explore experiences with DREAMS programs and the wider local setting in the context of DREAMS interventions and describe intersections between structural processes and interventions aimed at promoting societal norms that protect AGYW from acquiring HIV.

2. Methods

2.1. The DREAMS intervention setting

Data for this study were drawn from a larger impact evaluation conducted by the Africa Health Research Institute (AHRI) to understand components of the DREAMS intervention (Birdthistle et al., 2018). AHRI is a long-running surveillance site located within the rural Hlabisa sub-district in uMkhanyakude district (Gareta et al., 2021). In this setting, about 19% of AGYW and 5.6% of adolescent boys and young men (ABYM) (aged 15–24 years old) were living with HIV in 2016 when DREAMS was introduced (Francis et al., 2018). The DREAMS implementation site had 20 municipal wards and 17 primary health care facilities with only 10% of the households within 15 min' travel time (driving) to primary health care (Hlabano, 2013). The study area has high rates of in and out migration for reasons related to seeking accommodation, employment and education (Camlin et al., 2010; Iwuji et al., 2018; Muhwava et al., 2010). Livelihoods are maintained largely through receipt of government grants and subsidies (Mkhize, 2018). The population is relatively young, with more than 50% below the age of 35 years and women are the majority (Mkhize, 2018).

2.2. Study design

We used an ethnographic qualitative study design. Data collection methods combined: group discussions (GDs), longitudinal in-depth interviews (IDIs) with adolescents and young people, IDIs with government stakeholders and DREAMS implementing partners, and rapid community mapping and observations in four communities (1 semi-urban (township) and 3 rural areas) to understand barriers and facilitators that affect young people's engagement in DREAMS interventions.

2.3. Sampling procedures

Young people targeted by DREAMS were selected by homogeneous stratified purposive sampling. Community members, government stakeholders and DREAMS IPs were purposively sampled. Inclusion criteria for AGYW and ABYM were (1) participants able to give written informed consent (parents or guardians for participants under 18 years); (2) young people within the ages targeted by DREAMS (10–24 years AGYW, 15–35 years ABYM), (3) and for AGYW/ABYM to reside in the study area. Inclusion criteria for IPs were (1) to be implementers of DREAMS or DREAMS like interventions in the study area. Interventions included, school-based life orientation, peer support, HIV testing and treatment, voluntary medical male circumcision (VMMC) and sexual and reproductive health (SRH) care. All participants needed to be available to participate during the study period.

2.4. Data collection tools and procedures

Data collection tools, including topic guides and an observation

checklist were developed and piloted in two rural communities for a period of two months by a team of eight (four men and four women) research assistants and the first author (TZ) who provided oversight. Different study tools were used to cover four areas with all participants: the social context for adolescents and young people, the reach and coverage of different health services for young people, understanding personal expectations, perceptions and experiences of DREAMS and other similar interventions, and understanding experiences and perceptions of those who delivered interventions. The team held regular debriefing meetings on their experiences and to reflect on the appropriateness of the tools for different age groups. During this process, the tools were refined with guidance from the last author (MS). During recruitment, research procedures were explained to all participants in their local language, isiZulu. Data were collected over 21 months, (May 2017 to January 2020).

Community observations: mapping and observations were conducted by the first and last author and the team of research assistants to observe IPs' intervention activities and gain a broad understanding of the social context for AGYW/ABYM and the coverage of different interventions. Observations were conducted in 2017 where the team observed and actively engaged with the research participants through informal discussions in schools and in their neighbourhoods. A structured observation checklist was used to record how young people interacted with different interventions and materials, and to note what worked (Bond et al., 2019). Observer notes were captured to augment the checklist.

Group discussions: All GDs were conducted in 2017. We explored expectations, perceptions about and experiences of SRH with the wider DREAMS and DREAMS type interventions. AGYW/ABYM groups were divided by age: those who were in school (younger) and those who were out of school (older), to allow for age-appropriate engagement. GDs (AGYW/ABYM and community members) comprised 4 to 8 individuals and lasted one to 2 h in places where participants came together naturally ('natural' group discussions) such as during daily social activities (Kielmann, Cataldo, & Seeley, 2012). GDs were also organised in venues arranged by the researcher. GDs solicited a range of views on how the context influenced the intervention and captured experiences and views of DREAMS. GDs with parents and/or guardians were used to gain an understanding of their perceptions and engagement with DREAMS and other non-DREAMS activities within the setting.

Longitudinal interviews: From 2017 to 2020, repeat IDIs were conducted with young people (n = 58, year 1; n = 50, year 2; n = 37 in year 3) using a common topic guide to explore how young people targeted by DREAMS experienced and perceived the intervention. IDIs took between 30 and 60 min and were conducted in participants' homes or other venues which provided privacy. Subsequent interviews were arranged through phone calls or visits at home. The extended contact provided an opportunity to obtain rich descriptions on perceived factors that affect engagement in DREAMS over time.

One-time interviews: Single IDIs with DREAMS IPs and stakeholders were conducted in 2017 and 2018 to explore their experiences and perceptions. IDIs took between 30 and 60 min and were conducted in participants' offices.

2.5. Data analysis

Recorded GDs and IDIs were transcribed verbatim and translated from isiZulu to English by the research team. Translations were validated by TZ (a fluent isiZulu and English speaker who has been involved in transcribing and translating data for more than 10 years). Transcripts were stored on password protected computers. Managed through NVIVO 11, transcripts were independently viewed and coded by TZ and SH. Raw data were organised through open coding with themes related to experiences and perceptions of DREAMS and how the implementation of DREAMS was influenced by the context. Initial codes were then expanded by themes reflecting the participants' narratives and discussed between TZ and SH who both refined the coding framework. Codes were discussed with MS and differences were resolved through discussion. Validity was strengthened through examining responses from different sources of data (GDs, observations and IDIs).

2.6. Ethics

Ethical approval was granted by the University of KwaZulu-Natal's Biomedical Research Ethics Committee (BREC) (Ref: BFC339/16) and the London School of Hygiene & Tropical Medicine's Research Ethics Committee (Ref: 11835). Gatekeeper permission was provided by the Hlabisa District Hospital, and the AHRI Somkhele Community Advisory Board.

3. Results

3.1. Participant profile

Observed interventions with two IPs included community-based condom distribution and demonstration (n = 2); HIV services (testing, treatment, and PrEP) (n = 1); and a curriculum-based HIV and violence prevention intervention with (n = 2) AGYW who were in secondary school. Thirty-one AGYW and 48 ABYM aged 15–30 years and parents/guardians (8 males and 43 females) aged above 18 years participated in GDs. Longitudinal IDIs with young people included 35 AGYW and 23 ABYM. Loss to follow up in 2018 was 3 AGYW and 5 ABYM and in 2019–2020 12 AGYW and 9 ABYM. Relocation was the main reason for loss. These participants were not replaced. In 2019–2020, four participants refused to be interviewed for the third time, stating that they did not have time. From IPs, managers (n = 4) and facilitators (n = 13) from organisations involved in condom promotion and provision, PrEP, post-violence care, SRH services, school-based HIV and violence prevention, parenting/caregiver programs, social protection and community mobilization and norms change were interviewed. Local government stakeholders included the district DoH (n = 4), the municipality (n = 4) and the department of social development (n = 1). A summary of different

Table 1
Outline of data collected between May 2017–January 2020

LONGITUDINAL Interviews (IDI)		Focus Group Discussion (GD)
Beneficiaries (YOUNG PEOPLE)		
YEAR 1 N = 58 (35 FEMALES & 23 MALES)		13 GDs N = 79 participants
YEAR 2 N = 50 (32 FEMALES & 18 MALES)		Age range (years) female (11–21)
YEAR 3 N = 37 (23 FEMALES & 14 MALES)		male (11–27)
AGE RANGE (YEARS) FEMALE (10–24) MALE (12–35)		Gender female (31)
gENDER FEMALE (35) MALE (23)		male (48)
COMMUNITY		6 GDs n = 51 participants
		Age range (years) male ≥18
		female ≥18
		Gender male (8)
		Female (43)
ONETIME INTERVIEWS (IDI)		
Implementing Partners	4	
IP 1	2	
IP 2	6	
IP 3	5	
IP 4	Total 17	
Stakeholders	4	
DoH	4	
Municipality	1	
DsD	Total 9	
RAPID COMMUNITY MAPPING in four communities over three years		
SITE A – SEMI URBAN		
SITE B – RURAL		
SITE C – RURAL		
SITE D- RURAL		
OBSERVED DREAMS INTERVENTIONS: COMMUNITY-BASED CONDOM DISTRIBUTION AND DEMONSTRATION; HIV SERVICES (TESTING, TREATMENT, AND PREP); AND A CURRICULUM-BASED HIV AND VIOLENCE PREVENTION INTERVENTION WITH IN-SCHOOL AGYW		

groups and data collection activities is presented in Table 1.

During analysis, we identified themes describing experiences and perceptions of DREAMS at the individual, interpersonal, organisational and community levels from young people who had been targeted by DREAMS, community members and implementing partners who delivered DREAMS interventions **(Table 2).**

3.2. Individual level

While increased visibility and access to SRH services improved engagement with DREAMS interventions, restrictive gender norms led to poor engagement.

Increased visibility and access to SRH services: AGYW, particularly those who were in school and aged <18 years old, said that the DREAMS health promotion generated demand for HIV prevention strategies and improved health information and behaviour. When asked about why she thought DREAMS improved behaviour, one 15-year-old female said: *"Yes, because DREAMS has helped most young people to practice safe sex and know which services to use to be protected"* (IDI 07, Site C, 2017).

To fast-track access to and strengthen existing biomedical interventions, participants said that IPs delivered health care services in local primary health care facilities and within communities. Interventions that were reported by participants included HIV services, links to ART adherence clubs, condom distribution and demonstration, mobilization through outreach and demand creation for family planning, including new methods like implants. Participants felt that information provided to young people through DREAMS also introduced new options for HIV prevention, such as PrEP. One 15-year-old AGYW shared: *"New interventions like PrEP help us in gaining information because sometimes our parents hide information from us but in these programmes, we receive information about new HIV prevention methods, safety precautions that we can take if we are interested in sex, because they [parents] will not prevent us from doing it [sex] if we want to do it"* (IDI 06, Site C, 2017). In contrast, some AGYW had reservations about PrEP because they had never heard about it from their local health care providers and thought it may encourage young people to have unprotected sex. For example, a 14-year-old female said *"Oh, people would take the pill and then behave anyhow because they know that they will not be infected with HIV"* (IDI 09, Site C, 2018). Through DREAMS, improved access to adolescent youth friendly services (AYFS) (established by the DoH in 2017) was also reported by some participants.

Table 2
Summary of findings.

Socioecological level	Sub-themes	Final Codes
Individual	- Increased visibility and access to SRH services - Restrictive gender norms - Limited engagement with out of school AGYW and grade 12 learners - Collaboration with different organisations to enhance engagement of male partners and to strengthen HIV services for men - Lack of mobilization and engagement of young men	- Access to services - Gender/Social Norms - Male partner engagement - HIV services for men
Interpersonal	- Engagement and opportunities for families to support AGYW - Lack of parental endorsement	- Family engagement - Family/parent endorsement
Organisational	- Expanding beyond a single-intervention approach and strengthening existing infrastructure - Challenges in layering and coordination of services	- Coordination of services - Layering
Community	- Promoting gender equity and reducing AGYW's vulnerability to HIV through community mobilization	- Community mobilization

AYFS included happy hours (1 h set aside every day to attend to youth health care) at clinics and priority queues for school children in uniform. A 16-year-old female said: *"It [AYFS] is a good service as I have explained before that people will be afraid to consult in public places (public health care facilities). Testing at home and in tents also makes it easy [private] for us"* (IDI 04, Site A, 2017). However, most participants were not aware of the AYFS programme and IPs could not support the programme in all facilities. One IP said, *"even DoH staff don't know AYFS because no one is dedicated, nobody wants to come up front and volunteer, it is usually us who try and push that AYFS exists and as we are DREAMS we are youth friendly"* (IDI, IP, 2017). Participants acknowledged that IPs further expanded access to services through community-based delivery of services. Traditional outlets such as informal food trading facilities and other public venues were used to distribute condoms.

Restrictive gender norms: AGYW explained that there were restrictive gender norms that made it hard for young women to engage with DREAMS SRH services. For example, participants said that even though SRH services were expanded through community-based delivery, for AGYW, this strategy was ineffective because they did not want to access SRH services, including condoms in public. A 17-year-old young woman said: *"The barrier is that we are afraid. It is just fear"* (IDI 04, Site B, 2018). Reported gender norms around the use of SRH services by AGYW seemed generally conservative. This was implied by the same 17-year-old participant who explained that: *"girls are afraid of going to the clinic because they are having sex"*. When asked about why they are afraid, the participant said: *"they gossip when they see us take these things [condoms]. They gossip and tell our parents"*. Although not explicitly stated, some participants in GDs also told stories that hinted at power relations between men and women and lacking skills to negotiate condom use with their partners: *"The people that supplied condoms, supplied them at the shops, and then left. They don't give us more information to help us to use condoms with boys"* (15-year-old-female, GD, Site C, 2017). AGYW's involvement with sex, teenage pregnancy and SRH services was viewed as unacceptable in the community being linked to the behaviour of "bad girls".

Even though DREAMS was perceived to increase visibility and access to condoms and SRH services, it did not deal with individual and normative beliefs around young women's sexual activity which were deeply embedded within AGYW narratives and influenced their decisions to engage with biomedical interventions. The tension between new products that were seen to liberate young girls' sexuality and traditional practices around female sexuality reflects the importance of the family and community norms and mobilising local support for new interventions prior to delivery. We explore the interaction with DREAMS interventions at the relationship and community levels in the next two sections.

Limited engagement with out of school AGYW and grade 12 learners: We found that AGYW who were doing grade 12 did not participate in the curriculum-based DREAMS programmes as they were busy preparing for examinations. In a GD, one 16-year-old female said, *"I feel bad about not being a part of it as I am in grade 12 because when you are part of it you learn many things which makes you get back into the line and become a good kid."* (IDI 05, Site A, 2017). It was unclear how curriculum-based interventions were translated to those who did not attend to achieve norms change, an 18-year-old (out of school) female said, *"I would also like to hear what they (those attending) talk about over there, maybe it could help me. It is my sister who attends. I can see she is trying to change her behaviour"* (IDI 03, Site C, 2018). Even though they were not able to attend, AGYW in grade 12 were informed about the importance of HIV testing or referred for HIV testing to a local clinic or a DREAMS IP.

Collaboration with different organisations to enhance engagement of male partners and to strengthen HIV services for men: Several interventions aimed at decreasing the risk of HIV transmission from male sexual partners to AGYW were strengthened through working with government departments such as DoH. These included expanding HIV testing services (such as twilight testing in late hours, workplace testing and outreach) and HIV treatment for men, Voluntary Medical Male

Circumcision (VMMC), and condom distribution and demonstration. Most young men considered HIV testing and treatment important and the DREAMS community-based strategy to expand HIV testing services worked well to reach men and provided an opportunity to test those who were unlikely to test, a 21-year old male said, *"No, I personally see it as a very good thing because even the one who runs away from testing for HIV; like when people keep on telling him that they've tested for it, they will also end up gaining a nerve"* (IDI 01, Site D, 2018). However, the idea of taking daily medication was perceived a burden due to fear of being known by others to be HIV positive as suggested by one 19-year-old male in a GD, *"Ehh, maybe it could be that they are afraid of how people will perceive them that they are now HIV positive"* (16-year-old male, GD, Site A, 2017). Even so, there were a few young men who thought *"taking treatment is a good thing"*, they said they would initiate treatment early *"to protect themselves and to protect others"*.

In our discussions with young men, we also found that they were less inclined to use a condom if they had undergone VMMC and perceived their partner to be 'beautiful' (healthy and not living with HIV): *"It happens that you see a beautiful person then you want to have unprotected sex (laughs) and not use a condom. You might get the disease but just because you want to have unprotected sex you carry on"* (20-year-old male, GD, Site B, 2017). According to participants' descriptions, the desire for condomless sex was a risk worth taking.

Like AGYW, young men preferred interventions and health care services that were community-based and mentioned that such interventions provided privacy and confidentiality: *"There is a long wait at the clinic, and we are afraid because it seems our nurses cannot keep our information confidential and they shout at us"*, (GD, Site B, 20-year-old male, 2017).

Lack of mobilization and engagement of young men: Even though DREAMS expanded HIV testing and treatment services and worked with DoH to mobilize VMMC for HIV prevention, interventions excluded ABYM in the curriculum-based interventions. In group discussions, young people said that this exclusion of men was counterproductive and inequitable. To express a concern about the lack of engagement of young men, one IP said that *"DREAMS is for girls, how about the boys. We do not know how young boys communicate with their fathers, because DREAMS is limited to girls"* (IDI, IP, 2018). Participants, including IPs, felt that this intervention limited impact by leaving out ABYM and therefore did not play a major role in reducing HIV incidence among AGYW. We also found that young men suffered their own vulnerabilities, especially unemployment, alcohol and drug abuse as well as exposure to violence and crime which DREAMS interventions did not adequately respond to. ABYM often left their communities to pursue financial stability due to a lack of opportunities within their communities.

3.3. Interpersonal level

None of our participants reported participating in family strengthening interventions delivered by DREAMS and perceived this as one of the missed opportunities for parental support which could have aided utilization of SRH services provided by DREAMS. Further, male sexual partners who were in the same geographic locations as AGYW in this study felt that DREAMS increased access to HIV testing services, however, it did not make an impact in engaging young men to participate in curriculum-based interventions.

Engagement and opportunities for families to support AGYW: To build intergenerational relationship skills, IPs reported that they offered a family strengthening parent/child intervention called Let's Talk. The programme was designed to help parents and teens build healthy relationships with one another and openly discuss sensitive topics (e.g. HIV, sex, family planning (FP), peer pressure). Participants reported structural constraints involving transport costs and time as barriers to participation in this programme. Interviews with IPs revealed that Let's Talk sessions with AGYW and their parents or caregivers would be followed up by discussions with AGYW at home to find out if communication skills between them and parents had improved so that facilitators could continue to assist them at home: *"after having gone back home after the sessions, we follow up at home to find if things are better, if they can sit and talk, we ask the child if it [communication] is better"*, (IDI 02, IP, 2017). In IDIs with AGYW, none reported home visits from IPs regarding follow up discussions related to Let's Talk. Our discussions with AGYW demonstrated a lack of communication and guidance between AGYW and their parents or immediate family. In addition to structural barriers, ineffective engagement by IPs contributed to low uptake and lack of participation from AGYW and their families.

Lack of parental endorsement: In GDs, AGYW shared that some parents did not endorse and understand the DREAMS concept and they therefore refused to allow their daughters to participate in curriculum-based interventions. As such, some of those under the age of 18 years who required parental consent were unable to participate: *"Sometimes mothers are not keen that their children are attending these programmes because they are scared that they will learn about things out of their ages"*, (19-year-old female, GD, Site B, 2017).

3.4. Organisational level

Expanding beyond a single-intervention approach and strengthening existing infrastructure: DREAMS mobilised the broader community by engaging several government departments in addressing social norms that increase HIV risk for AGYW. As part of community mobilization, DREAMS reinforced the DoH strategy of expanding beyond a single-intervention approach and strengthened existing infrastructure (through delivery of facility-based services such as the AYFS programme) to address AGYW's health-related issues. DoH stakeholders mentioned that they also expanded community-based services including *"those that deal with how young people behave, information about how to promote their lives, which is called health promotion on HIV, diabetes, cancer and things like that, and encouraged men to get involved in programmes for men"*, (IDI, DoH, 2018). Utilising a multiple IP model, DREAMS also worked with the Department of Social Development to enhance work already done by local organisations with orphans and vulnerable children, such as social asset building and social protection. The DREAMS initiative went beyond health-related programmes to address factors that include AGYW social isolation, poverty, and inadequate schooling which all contribute to AGYW vulnerability to HIV and a life not lived to its full potential.

Challenges in layering and coordination of services: It was mentioned that interactions between IPs and government stakeholders were limited and therefore maximising the strength of combination interventions was affected. Some of the reasons linked to limited interaction were related to local politics as expressed by one IP, *"We usually held meetings with DREAMS at large where you will find that all the partners are present, DoH will be there, DoE will be there, but I think that the problem starts when we want to use schools as venues and they [DoE] will say that they want a letter that states we are conducting DREAMS programmes, we talked to them [DoE] but we never received that letter"*, (IDI, IP, 2018).

Longstanding organisations were able to overcome some of these challenges because they had worked in the community for more than 10 years and had established relations at the local and district levels. Such programmes retained sustainability through their potential to work with young people during and after the DREAMS programme as stated by one IP: *"No even if they [DREAMS activities] do not continue, us as an organization, we were there before DREAMS and will be there even after DREAMS. For us because we work with youth, we do not only work because of DREAMS. So even if we are not with DREAMS, we will continue* supporting *the youth"*, (IDI, IP, 2018). For organisations that were new in the community, the rollout of the programme was slow due to low community buy-in and lack of shared understanding between IPs and community members. Additionally, new programmes, such as PrEP, ceased abruptly when

DREAMS ended, and were therefore not sustained through new funding sources or as part of DoH services.

3.5. Community level

Promoting gender equity and reducing AGYW's vulnerability to HIV through community mobilization: Group dialogues held in safe spaces were used to facilitate social norms change among AGYW participating in DREAMS. Through the curriculum-based intervention, DREAMS expanded the already existing Department of Education school-based life orientation which focused on career guidance, development of the self in society, physical education, and social and environmental responsibility. AGYW who participated regarded IPs to be "helpful" and "open" when delivering interventions in the school setting where they could ask questions freely. They believed that the intervention empowered them to take care of their sexual and reproductive health, including preventing high risk sexual behaviours. One 18-year-old female said *"they allowed us to ask all sorts of questions. We could not talk about condoms in our mom's presence (laughs)"*, (IDI 02, Site A, 2018). Generally, AGYW aged 10–21 years were recruited into the curriculum-based interventions from both primary and secondary level schools, grade 4 to grade 11 by local community organisations which were already embedded in the communities and needed few resources to implement delivery. These interventions reinforced the collective identity of AGYW and leveraged social networks (through mentorship) to support change. Those involved attended an average of four-five sessions which took part during life orientation programmes at school – 2 sessions per month, ranging from 60 to 90 min each. Specifically, the benefits narrated in discussions were related to gender norms - how a young girl was expected to behave "*not be involved with boys or fall pregnant, be respectful and finish school*". Those who benefited included school going AGYW as the programme was delivered in schools and therefore excluded those out of school.

4. Discussion

This study highlights how individual, interpersonal, organisational and community related factors interact to shape the experience and influence engagement of adolescents and young people with multilevel interventions. Furthermore, it illustrates the key role that community and family norms play. Different factors operating across individual and community levels presented unique and interactive impacts on participants' experiences with sexual activity, the use of HIV prevention and SRH services offered in the DREAMS programme. We found that gender inequality and restrictive gender norms continued to inform how AGYW behaved, contributing to unmet needs for HIV and SRH health care, regardless of their exposure to DREAMS interventions. These findings build upon an increasing body of literature highlighting that applying a gender and culture lens to interventions is important in order to respond to broader norms change among young people, including gendered systems that surround them (George, Amin, de Abreu Lopes, & Ravindran, 2020; Levy et al., 2020; Marston & King, 2006).

Social norms around sexuality and structural barriers limited AGYW to uptake services, and did not change men's interest in multiple partners and condomless sex (Mojola & Wamoyi, 2019; Skinner, Davies, Marino, Botfield, & Lewis, 2019, pp. 393–411). These findings have implications for research, programs, and policies to address normative beliefs around young women's sexual activity which we found deeply embedded within AGYW's narratives and influenced their decisions to engage with biomedical interventions. Additionally, these findings demonstrate a requirement for universal risk informed HIV prevention that provides differentiated interventions based on need e.g., improved SRH services for men.

The willingness and ability of AGYW in our study to use family planning methods and HIV services were affected, often negatively, by factors operating within and across individual and contextual levels. Research studies looking at predictors of sexual risk among AGYW have found that understanding the risk and protective factors through exploring the social, behavioural, and individual factors can help in designing HIV prevention interventions among this group (D. Govender, Naidoo, & Taylor, 2020; K. Govender et al., 2018; Hilton, Osman, Knight, & Karim, 2018; Psaros et al., 2018). Nevertheless, precise data on how AGYW can balance and manage layered risk behaviour are lacking.

At the family level, DREAMS offered a family strengthening parent/child intervention aimed at changing social and family norms that limit AGYW's access to SRH services. Families have been viewed as major socializing agents for young people's behaviour (Mmari, Kalamar, Brahmbhatt, & Venables, 2016; Somefun & Odimegwu, 2018; Widman, Choukas-Bradley, Noar, Nesi, & Garrett, 2016). In this study, we found that there were challenges in recruiting and retaining AGYW and parents into parenting/caregiver programmes. AGYW felt that their parents were opposed to them accessing SRH care. In South Africa, parent/child SRH programmes present a missed opportunity to explore their impact in improving SRH outcomes among AGYW (Dilebo, Lebese, Ramathuba, & Makhado, 2020; Ganchimeg et al., 2014; Manzini, 2017). Additionally, structural barriers resulting from lack of money and time to attend sessions contributed to low uptake and lack of participation. Such barriers need to be taken into consideration, looking practically at what works to ensure that programmes offer educational packages that are culturally sensitive and open to rural contexts and address the structural socio-economic drivers of the HIV epidemic among AGYW. For example, combining gender transformative interventions with social protection (inclusive of cash transfers and care provision) have been shown in some contexts to strengthen program impacts (Hill, 2019; Mostert & Castello, 2020).

To enhance community mobilization, the programme went beyond health-related interventions and addressed factors related to the social isolation of AGYW through engagement in curriculum-based interventions. We found that schools were good places to identify and build relationships with AGYW, however, retaining AGYW in curriculum-based interventions was a challenge. This challenge was driven by a lack of parental buy-in due there being no endorsement of curriculum-based interventions. Further, well established organisations, with good community links, operated better and managed to build faster relations than new organisations. Research has shown that community mobilization and engagement could provide support structures to handle social and culturally bound issues and could potentially offer a drive for health activism among communities (Campbellet al., 2013; O'Brien, 2020). Through building community participation, programmes take into account the context in which interventions roll-out (Campbell & Cornish, 2012; Gibbs, Campbell, Maimane, & Nair, 2010). Our study suggests that coordination and program ownership is important at local level, as shown in a recent review (Asuquo et al., 2021). A more phased or step-wedged approach could allow for planned and systematic contextual adaptation and offer room for interventions to adapt and improve at each phase.

We found health system factors, especially issues with access to and delivery of SRH to AGYW to be a barrier. Issues around fear of judgment and mistreatment compromised access to and utilization of SRH services offered in DREAMS. These findings have been reported in other studies conducted in South Africa (Jonas et al., 2019; Müller, Röhrs, Hoffman-Wanderer, & Moult, 2016; Nkosi et al., 2019; Sullivan et al., 2018). Urgent policy efforts are needed to identify effective strategies to improve young women's access to and use of comprehensive, AYFS quality SRH health care.

From a societal standpoint, our findings warrant attention to the socio-cultural context and the ways in which the lives of young women are mixed up with the lives of men – so one cannot address the needs of women in isolation (Holmes et al., 2020). Some community members and stakeholders felt that young boys and men who had similar challenges to AGYW were being excluded by DREAMS and HIV prevention programs. Additionally, DREAMS success was challenged by other vulnerabilities experienced by ABYM, including alcohol and drug abuse as well as lack of

employment. ABYM also need appropriate services and structural interventions tailored to their own needs, not only as partners of AGYW.

The findings of this study must be seen in light of some limitations. First, given the wide age range of the sample, some of the questions or prompts may not have been equal in clarity across age groups with different levels of maturity and ability to articulate impressions. Second, due to the sensitive nature of SHR, we acknowledge that social desirability bias may have influenced participants responses. In response to these issues, the team had regular debriefing meetings to address appropriate data collection procedures and used different data collection methods, including longitudinal IDIs, GDs, and community mapping in different sites, thus confirming findings from different independent sources.

5. Conclusion and recommendations

Results from this study can offer lessons to those implementing DREAMS and other multi-level interventions to inform future investments in adolescent health. DREAMS interventions were acceptable to AGYW and were well received within their communities, however DREAMS missed an opportunity to include AGYW who were in Grade 12 and most of those who were out of school. Structural barriers, including lack of intervention fidelity, i.e. Let's Talk, limited AGYW's ability to uptake services and navigate risk. The fragmented nature of the community, family and male partner interventions as well as the limited attention to the importance of establishing good community links and building community mobilization partly explains DREAMS intervention limitations in building HIV competence in this poor rural community. Normative barriers, including intergenerational and gender power imbalances operating between men and women further constrained AGYW to make decisions around their sexuality and increased their risk and vulnerability.

Author's contributions

Thembelihle Zuma, Maryam Shahmanesh and Janet Seeley were involved in the conceptualization and in writing the original draft of the manuscript. Maryam Shahmanesh, Thembelihle Zuma, Janet Seeley, Siphesihle Hlongwane, Natsayi Chimbindi, Lorraine Sherr, Sian Floyd, and Isolde Birdthistle contributed to reviewing and editing of the manuscript. All authors reviewed drafts and read and approved the final manuscript.

Data availability statement

The data that support the findings of this study are available from the principal investigator and senior author [M. Shahmanesh] upon reasonable request.

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Declaration of competing interest

The authors declare that they have no conflict of interest.

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