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“We have our reasons”: Exploring the acceptability of pre-exposure prophylaxis among gay, bisexual, and other men who have sex with men in Ghana

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Abstract

Background Ghanaian men who have sex with men (MSM) face significant HIV disparities compared to the general population in Ghana. Pre-exposure prophylaxis (PrEP) is a highly effective tool for HIV prevention. Previous studies on the perspectives of PrEP use among Ghanaian MSM identified high interest in PrEP among this population. However, the knowledge from the previous research, which was the best available evidence at the time, was primarily hypothetical because those data were collected before any real-world implementation of PrEP in Ghana. The analysis aims to identify and understand the factors currently influencing PrEP acceptance.

Methods We analyzed focus group ($n=8$) data with Ghanaian MSM. We transcribed, coded, identified, and analyzed the responses using descriptive thematic analysis.

Results We identified two broad themes. Under theme one, which indicated almost universal awareness of PrEP but inaccuracies about PrEP were common, these were the categories: (1) Awareness of PrEP and antiretroviral therapy [ART], (2) confusion between pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis, (3) event-driven perceptions of PrEP usage, (4) Mixed understanding of PrEP: distinguishing PrEP from ART, and (5) advocacy for a comprehensive educational approach. Theme two revealed that PrEP acceptability was influenced by a mix of individual and intrapersonal factors such as (1) hesitancy towards PrEP uptake due to perceived limited benefit, (2) extending HIV, sex, and same-gender sexual relations stigma to PrEP affects uptake, (3) perceived lack of information, concerns about side effects, and cost.

Conclusions To bridge the gap between awareness, knowledge, and acceptability, HIV prevention programs should address access barriers and incorporate community-derived strategies.

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Introduction

Globally, HIV prevalence has decreased over the past decade, yet it remains disproportionately high among key populations, notably men who have sex with men (MSM). Key populations, including MSM, account for 70% of the global HIV burden, facing a risk 28 times greater than that of adult men who do not have sex with men [1]. In sub-Saharan Africa alone, where 60% of the new 1.7 million HIV infections occurred in 2018 [2], Ghana presents a generalized HIV epidemic with prevalence rates of 18.1% among MSM [3–5], compared to the 1.7% reported among the general population [6].

In response to this crisis, the global health community has embraced antiretroviral medications for pre-exposure prophylaxis (PrEP) as a preventive measure. The World Health Organization recommends PrEP as a highly effective biomedical prevention strategy for individuals at high risk of HIV exposure [7]. Oral PrEP has been a significant advancement in HIV prevention [8]. More recently, the development of an injectable formulation, which offers sustained release and has shown superior efficacy due to reduced reliance on daily adherence, has further broadened prevention strategies [9]. The persistent barriers, including a lack of comprehensive knowledge among MSM and other patient-level challenges, significantly impede the implementation and utilization of PrEP as an HIV prevention strategy [10].

In Ghana, the National AIDS/STI Control Program (NACP), under the auspices of the Ghana Health Service, laid the groundwork for PrEP delivery by incorporating it into the Consolidated Guidelines for HIV Care in Ghana as early as August 2019 [11]. This proactive step paved the way for the commencement of PrEP services to key populations a year later, in August 2020, with a particular emphasis on MSM [12]. Currently, only oral PrEP is available in Ghana, provided in the form of Emtricitabine and Tenofovir Disoproxil Fumarate (TDF/FTC). Research conducted in Ghana before the rollout of PrEP consistently indicated that a lack of awareness and knowledge among Ghanaian MSM was a significant barrier to PrEP's acceptance [10, 13].

To maximize the effectiveness of PrEP in reducing HIV incidence among key populations in Ghana, particularly as access to this preventive measure expands, it is crucial to understand the factors influencing the awareness, comprehension, attitudes, acceptability, and uptake of PrEP among Ghanaian MSM. The primary goal of this study was to explore the determinants of PrEP acceptability and uptake within a cohort of gay and bisexual men, as well as other men who engage in same-gender sexual activity in Ghana. The research was guided by two principal questions: (1) What levels of awareness, comprehension, attitudes, and acceptability do these men hold regarding PrEP?; (2) Do they view PrEP as an acceptable

and efficient means of preventing HIV? Understanding these factors is vital for the design of tailored educational and health promotion programs. This investigation aimed to reveal these factors to inform strategies that could bridge gaps in PrEP utilization. By identifying these determinants, this study could contribute to the development of targeted interventions that enhance PrEP utilization and adherence, ultimately reducing new HIV infections among MSM in Ghana.

Materials and methods

This study was part of the initial phase of a randomized controlled trial (RCT) designed to evaluate the feasibility, acceptability, and potential impact of a multi-level intervention aimed at reducing intersectional stigma associated with HIV, gender nonconformity, and sexual stigma and increasing HIV testing among MSM in Ghana [14]. This report provides an overview of the study approach; a more comprehensive description has been published elsewhere [14–16]. The findings presented here are based on focus groups (FGs) conducted during the formative phase.

Study design

The study employed a qualitative descriptive approach, using FGs to explore the acceptability and factors influencing the uptake of PrEP among MSM in Ghana. FGs are designed to elicit detailed descriptions of the shared experiences of participants [17]. FGs were conducted as part of formative research to inform the development of a multi-level intervention designed for evaluation in a randomized controlled trial (RCT). The FGs were designed to explore the determinants of PrEP acceptability and uptake among MSM in Ghana, providing critical insights to tailor the intervention for the RCT.

Study settings and sites

The parent study was conducted in Accra, the administrative capital, commercial hub, and largest city of Ghana, and in Kumasi, the second-largest city in the country. These locations exhibit a rich blend of ethnicities, religions, and cultural diversity, including migrants from various regions within Ghana and neighboring countries. Further, these cities are located in the Greater Accra Region and Ashanti Region, which were selected due to their high prevalence of HIV among MSM and their relatively larger populations of men with histories of same-gender sex compared to other regions in Ghana.

Study population and recruitment

Eligibility for participation in the FGs was limited to individuals who were 18 years of age or older, designated male at birth, self-identified as men, and had sex with other men within the previous six months. Convenience

sampling methods were utilized in partnership with two community partner organizations providing services to gender and sexual minorities to recruit study participants, who were recruited from September 1st, 2020, to October 30th, 2020.

Focus group guides

The guides used for FGs contained open-ended questions covering ten main domains. For the analysis, particular attention was given to the “Attitudes towards PrEP” domain to understand participants’ perspectives. Sample questions used to encourage dialogue in this area included: (1) Were you aware of PrEP before this study?; (2) Describe what you know about PrEP; (3) If PrEP were widely available, would you use it? and (4) What will prevent or aid you in using PrEP for HIV prevention?

Data collection

The FGs moderators involved in the study were individuals who self-identified as gay and bisexual men and were employees of LGBTQ+ serving partner organizations in their respective cities. These individuals received training in responsible conduct of qualitative data collection research, including managing group dynamics and minimizing social desirability bias to ensure consistency and reliability in data collection. A total of six FGs were conducted in English. Two FGs were conducted in Twi, the predominant language spoken in Kumasi, the seat of the Twi-speaking Ashanti Kingdom. Providing participants with a non-English language option allowed for the narration of certain experiences that could only be effectively described in their local indigenous language. Although Twi is the predominant language in Kumasi, the decision to conduct the majority of focus groups in English was based on the widespread use of English among the study population. English is commonly spoken and understood, especially in urban areas such as Accra and Kumasi, and is frequently used in educational, professional, and social settings. Conducting most of the focus groups in English allowed us to engage a broader range of participants who were comfortable expressing their thoughts in English. Eight focus groups were conducted. The number of participants in each group was as follows: FG1 (6 participants), FG2 (7 participants), FG3 (8 participants), FG4 (7 participants), FG5 (6 participants), FG6 (8 participants), FG7 (6 participants), and FG8 (7 participants). This group size was manageable enough to facilitate in-depth discussion while ensuring broad participation. The sample size was chosen based on the principle of thematic saturation. Sufficient focus groups were conducted to ensure that no new themes emerged from the data, indicating that saturation had been reached. This approach ensured a comprehensive understanding of the participants’ perspectives and experiences.

Participants were informed about the study, its voluntary nature, and the option to withdraw without consequences. Once a participant verbally indicated that all their questions had been satisfactorily answered, informed consent was documented with their signature. FGs lasted for approximately 90–120 min. All FGs were digitally recorded and transcribed. The research team, including bilingual research assistants, reviewed both English and Twi audio files to ensure consistency of translation and accuracy of the transcription.

Data analysis

Seven research team members with diverse expertise and cultural backgrounds analyzed the data transcripts. The analysis began with each team member independently reviewing six of the eight randomly selected transcripts to identify and label relevant concepts. This approach allowed for developing a preliminary codebook that captured a broad range of themes and insights. The decision to use six transcripts initially aimed to ensure that the preliminary codebook was comprehensive and accounted for the diversity of participant experiences. To ensure qualitative rigor, the study employed several strategies: 1) Multiple analysts reviewed and coded the transcripts independently to minimize individual bias and ensure a comprehensive understanding of the data. The diversity within the analytic team allowed for different perspectives to be considered, strengthening the validity of the findings. 2) The research team engaged in reflexive practices, holding regular discussions about their own biases and how these could potentially influence data interpretation. 3) To validate the findings, preliminary themes and interpretations were shared with a subset of community stakeholders.

After developing the preliminary codebook, the remaining two transcripts were analyzed to verify thematic redundancy and confirm that no new themes emerged. Although the majority of transcripts were used to develop the codebook, analyzing the final two transcripts was crucial to confirm that thematic saturation had been reached, and that the existing codebook accurately represented the participants’ perspectives. No new themes were identified in these final transcripts, supporting the conclusion that thematic redundancy was achieved. To ensure consistency and reliability, the team used regular meetings to discuss any discrepancies in coding. The discussion reached a consensus, and the codebook was refined to include new codes. After coding the remaining transcripts using the revised codebook, the codes were grouped into clusters and further analyzed to identify broader categories of participants’ experiences and perspectives. The research team then examined these categories across all transcripts to ensure their comprehensiveness and representativeness. Finally,

we identified themes by determining the main message(s) across the broad categories [18]. This rigorous approach to data analysis ensured that the findings were both reliable and reflective of the diverse perspectives of the study participants. The study was guided by a social constructivist framework, recognizing that participants' knowledge, attitudes, and behaviors are shaped by their social contexts and interactions.

Ethical review

Approval for this study was obtained from the institutional review boards of Yale University, Noguchi Medical Research Institute (which serves as the IRB for the University of Ghana), the Ghana Health Service, and the University of Toronto. Before their participation, all study participants who agreed to participate signed an informed consent form. As a token of appreciation for their participation, study participants received a small gratuity of 100 Ghanaian Cedis (approximately \$10 USD) for participating in focus group discussions.

Results

Two overarching themes characterized the men's awareness, comprehension, and acceptability of PrEP. Awareness was conceptualized as the conscious recognition of the existence of PrEP. Comprehension pertains to the accuracy of details about how it works and how it's supposed to be used, including its contraindications (e.g., don't take if you have a suspected HIV infection because of the risk of developing ART resistance) and limits (e.g., doesn't prevent sexually transmitted infections [STIs]). The first theme, which pertains to awareness and comprehension, is built on five categories, while the second theme, which pertains to acceptability, is built on three categories. The first theme, "almost universal awareness of PrEP but inaccuracies about PrEP were common," is underpinned by these categories: 1) Awareness of PrEP and ART, 2) confusion between pre-exposure prophylaxis and post-exposure prophylaxis, 3) event-driven perceptions of PrEP usage, 4) Mixed understanding of PrEP: distinguishing PrEP from ART, and 5) advocacy for a comprehensive educational approach. The second theme was PrEP acceptability, which was influenced by individual and intrapersonal factors. The corresponding categories were: (1) Hesitancy towards PrEP uptake due to perceived limited benefit, (2) Extending HIV, sex, and same-gender sex relations stigma to PrEP affects PrEP uptake, (3) Perceived lack of information, concerns about side effects and cost act as barriers to PrEP acceptability. These identified themes highlight the importance of addressing gaps in awareness and knowledge of PrEP while acknowledging the complex and diverse factors influencing PrEP's acceptability.

Theme 1: there was an almost universal awareness of prep, but inaccuracies about PrEP were common

Awareness of PrEP and ART

The focus group discussions demonstrated that some participants had a reasonable understanding of the distinctions between PrEP and ART, recognizing that both involve antiretroviral drugs but serve different purposes. Participants in two FGs correctly noted that PrEP is used for HIV prevention with a simpler two-drug regimen. In contrast, ART is used for treating HIV-positive individuals and typically involves a more complex three-drug regimen.

"The thing is that, we need to admit that PrEP currently in Ghana is simply ARVs for all of us to understand. It's the same medication that people living with HIV take. The only difference here is that we use three different medicines for people who are HIV positive but if you are taking it for PrEP, we use two combinations, so instead of three medicines, if you want to take PrEP, you just take two. That is basically PrEP" (Group 4, Kumasi).

This statement reflects a correct understanding of the overlap in medication types and the differentiation based on the number and purpose of the drugs used.

Confusion between pre-exposure prophylaxis and post-exposure prophylaxis

All the participants in the FGs had heard of PrEP prior to the interview, with participants in two FGs indicating that they knew what PrEP was used for. Among those who indicated knowledge of PrEP, it was generally understood as a medication you take after exposure to HIV, thus describing post-exposure prophylaxis (PEP), and not PrEP, which is for pre-exposure. In the excerpt below, a participant reveals a notable misconception surrounding PrEP and its confusion with post-exposure prophylaxis (PEP). The participant's comment reflects a context where PrEP is associated with a specific use case— providing medication to staff who have been exposed to potential HIV transmission sources like blood or blood products.

"We use it for our staff, any staff who get infected, you get exposed to blood or blood products, PrEP or blood splash, we test you and give you PrEP then three months later we test you again, if you are fine, fine." (Group 3, Accra).

This misunderstanding indicates that some individuals might perceive PrEP as a form of "emergency" or "post-exposure" treatment rather than its intended use as a preventive measure before potential exposure.

Event-driven perceptions of PrEP usage

In two focus groups in Kumasi, the men discussed their knowledge of PrEP, describing it as an event-driven prevention method. Participants discussed the concept of PrEP use in relation to specific events or behaviors that might increase their risk of HIV exposure. However, it is important to note that none of the participants specifically mentioned on-demand PrEP dosing (PrEP 2-1-1), a regimen involving event-driven PrEP uptake surrounding the time of a sexual encounter. The discussions focused primarily on the general idea of taking PrEP regularly as a preventive measure rather than specific dosing strategies that align with sexual activity. The perspectives shared underscored a mixture of awareness and misperception. As highlighted by a participant: “What I know about PrEP is that you need to take it for about a month for prevention and after the month you take it when you are ready for sex” (Group 4, Kumasi). While correctly acknowledging the need to take PrEP for prevention, there was an apparent misunderstanding regarding the timing of its consumption.

Mixed Understanding of prep: distinguishing PrEP from ART

Discussions across the focus groups revealed a mixed understanding of PrEP and its personalization among participants. Many participants believed that, like other medications, PrEP regimens could be tailored to individual needs. This perception was evident in statements suggesting that different types of PrEP were available, tailored based on personal health conditions. A common sentiment was also expressed that PrEP decisions would be personalized after testing.

“As it is PrEP is now becoming common. PrEP is just not like paracetamol, it’s a variety of medications. The PrEP you will take will be different from the PrEP I may take.” (Group 3 Accra).

“PrEP is different for everyone. After you test, then they will decide which one you get... So when I start, what they give me will be different from what my brother[redacted] is taking” (Group 4, Kumasi).

These discussions indicate that there is a general misunderstanding among MSM in Ghana regarding the availability and standardization of PrEP. In reality, only one PrEP formulation, TDF/FTC, is currently available in Ghana. The perception that PrEP can be tailored may stem from the awareness that ART regimens are often personalized, leading participants to believe that PrEP follows a similar approach.

Advocacy for a comprehensive educational approach

Participants emphasized the pressing need for intensified education to enhance PrEP.

awareness and understanding, acknowledging the prevalent lack of knowledge. The consensus was that delivering comprehensive information was pivotal. It should include all aspects such as dosage, potential side effects, long-term implications, and general information about PrEP, including where to access it. Participants believed that increasing knowledge may increase acceptability among MSM in Ghana. One participant shared:

“We talked about PrEP. I think the education on PrEP is not that strong, I think we should do more education on PrEP because it seems like people don’t understand and don’t know the reason why they will be taking drugs to prevent only HIV because I am a case manager, I test people who tend to be negative and I try to preach the gospel to them about PrEP but you can see that the community is not accepting it. I can see that the education is not that strong, so I think we have a lot to do about PrEP issue” (Group 4, Accra).

Theme 2: PrEP acceptability was influenced by a mix of individual and intrapersonal factors**Hesitancy towards PrEP uptake due to perceived limited benefit**

In all eight FGs, participants were quite hesitant about PrEP uptake. The most recurring reason shared by participants was the limited benefit of PrEP in preventing HIV only and not other STIs. Participants felt that it was quite limiting to take a medication daily to prevent only one disease when usually the concern is more about pregnancy with their female partners and STIs such as gonorrhoea and syphilis with their male partners. They described PrEP as an inconvenience, especially if they needed to take other actions to prevent other STIs. The statement from a participant:

“I cannot waste my time taking drugs every day to prevent me from HIV, only HIV, for me [to be] catching other STIs so it’s better for me to leave this PrEP and concentrate on my condom use.” (Group 4, Accra) presents a compelling perspective on the perceived drawbacks of using PrEP as a HIV prevention strategy.

While the most frequent preference was not to use PrEP because it only protects against HIV, participants in one focus group in Kumasi differed. In this group, participants acknowledged the limitation of PrEP in protecting against other STIs. However, they introduced a unique perspective driven by their motivations for considering PrEP. The statement from Group 3 in Kumasi, “We have our reasons though, we understand PrEP doesn’t prevent other STIs but at least you have HIV to not worry about,”

offers a nuanced perspective on the decision to adopt PrEP despite its limitations. This viewpoint sheds light on the trade-offs individuals may consider when making choices about their sexual health. Group 3's acknowledgment that PrEP doesn't provide protection against other STIs demonstrates a clear understanding of PrEP's scope and limitations. However, their willingness to use PrEP primarily to prevent HIV suggests that they prioritize this particular concern above others. This choice reflects a calculated decision based on perceived risk and priorities. The phrase *"at least you have HIV to not worry about"* underscores the significance of HIV as a major health concern. For some individuals, the peace of mind that comes from knowing they are protected against HIV may outweigh the concern of contracting other STIs.

There was a strong preference for condom use overall as the preferred HIV prevention method. Condoms were characterized as a routine part of sexual encounters and remained the primary HIV prevention strategy they were most familiar with. Participants discussed condoms as convenient and less burdensome compared with *"the stress of taking a pill every day"* (Group 1, Kumasi). Additionally, discussions revealed a firm decision against taking PrEP, underpinned by their current practices of using condoms and lubricants as preventive measures against both HIV and STIs. Their decision emerged from their confidence in their existing practices, specifically the use of condoms and lubricants, as effective measures against both HIV and STIs. The collective sentiment, which was echoed by a participant, *"I will not take it. Since I am still using condoms and lubricant, I'm using them correctly and I am using them to prevent HIV and STI's already, so I am not going to double protect myself."* (Group 2, Accra) signifies their belief in their method's sufficiency. This shared viewpoint reflected the group's understanding of layered preventive strategies and their perception that adding PrEP would be redundant.

Within the discussions of two focus groups in Accra and one in Kumasi, a shared perspective emerged regarding the necessity of using condoms for protection, even in the presence of PrEP availability. Participants exhibited a degree of skepticism towards the standalone effectiveness of PrEP, suggesting that its protective capability might be insufficient when considered alone. This skepticism led participants to favor condoms as a more reliable option for ensuring their sexual health. As explained by this participant:

"I am just getting the information that even with the PrEP, you still need to, there is a bigger possibility of you still using a condom, which means that PrEP doesn't really do anything. Let me go for the condom and know I am safe" (Group 1, Accra).

Extending HIV, sex, and same-gender sexual intercourse stigma to PrEP affects PrEP uptake

Stigma emerged as a significant barrier to PrEP acceptability among participants. Despite awareness of PrEP, the association of PrEP with HIV treatment led to concerns about being stigmatized as living with HIV. The participants' perspectives unveiled two main points. Firstly, a prevailing assumption arose that individuals taking PrEP were already living with HIV. Secondly, a perception existed that those living with HIV were subjected to stigma and discrimination. Despite recognizing the potential of PrEP to prevent HIV acquisition, participants expressed concerns that using PrEP might imply living with HIV.

"Trust me, if it [PrEP] is being advertised and made public for everyone to know in Ghana where we are, anyone who sees you holding the drug [PrEP] would say you are positive and won't even come closer to you again." (Group 2, Kumasi).

This stigma is not rooted in a fundamental unawareness of PrEP but rather in societal attitudes towards HIV and the implications of being associated with antiretroviral drugs.

In all of the group discussions, there were concerns about being identified as living with HIV, an identity that is currently stigmatized. Participants were concerned about having a similar medication schedule with persons living with HIV, in which they both had to take a pill daily:

"I think there is no difference between the one who has HIV and the one who doesn't have. This is because the one with HIV takes drugs everyday as well as the one who takes PrEP. How will people know who has HIV and who does not have it [HIV]? I am sure if they see me taking medication every day, they will say I have HIV." (Group 4, Accra).

This quote illustrates the fear that daily medication, whether for prevention (PrEP) or treatment (ART), could lead to assumptions about HIV status, reinforcing stigma.

Moreover, the study identified a third reason for potential stigmatization—people assuming PrEP usage is indicative of engaging in "risky" sexual behaviors, primarily among MSM.

"Even in the hospital, to get a PrEP thing, it's 'like' why do you need PrEP, why are you asking of PrEP, they have already perceived you to be going to do something so you need PrEP...otherwise why do you want it?" (Group 3, Accra).

This perspective highlights a deep-seated bias and misunderstanding surrounding PrEP and the individuals who might benefit from it. The perception that merely inquiring about or seeking PrEP is met with judgment and suspicion indicates a prejudiced mindset prevalent in healthcare settings.

Discussions among the groups emphasized a complex web of stigma and barriers associated with seeking PrEP in Ghana. One significant concern raised by focus groups is the fear that seeking PrEP within healthcare settings may inadvertently lead to self-identification as an LGBTQ+ individual, which can further contribute to stigmatization. As described by a participant: *“In government hospital, it will take a lot of push and pull before we will give it to you, even that, they will ask, are you MSM? That makes you feel someway”* (Group 3, Accra). This highlights the challenging dynamics within healthcare settings. The requirement to visit a hospital to access PrEP can be viewed as a source of stigma itself, as it may expose individuals to judgment and scrutiny. The mention of healthcare providers asking, *“are you MSM?”* underscores the added layer of stigma faced by LGBTQ+ individuals. This line of questioning can make individuals feel uncomfortable, potentially leading them to withhold information about their sexual orientation or behaviors, which is detrimental to their overall healthcare.

A prevailing sentiment across the groups was the apprehension that introducing PrEP into the MSM community might inadvertently encourage a surge in high-risk sexual behavior and the development of multiple sexual partnerships. These concerns, voiced by all but one focus group (Group 1, Kumasi) revolved around the potential negative consequences such behavior might entail within the MSM community. Participants expressed reservations that the availability of PrEP, while aiming to prevent HIV among individuals engaging in risky behaviors, could inadvertently promote such behaviors by providing a sense of protection. A participant's perspective, *“Since PrEP prevents HIV in people who live risky behaviors, thus encouraging people to live that risky lifestyle and this will prevent me from using it”* (Group 3, Kumasi), succinctly captures this sentiment.

Perceived lack of information, concerns about side effects, and cost act as barriers to PrEP acceptability

Amid the various themes discussed, a common thread of confusion and insufficient information about PrEP dosing, processes, and side effects emerged across all focus groups. This lack of clarity was evident while not as widespread as other concerns. Participants consistently expressed a sense of inadequate awareness surrounding PrEP, with misconceptions particularly noticeable in relation to dosing schedules and potential ramifications

of missed dosages. A participant's question, *“Does that mean that I may contract the virus when I fail to take PrEP even for a day?”* (Group 4, Kumasi), exemplifies this uncertainty.

The participants consistently highlighted concerns regarding potential side effects, particularly those related to kidney health, as well as perceived complications associated with PrEP usage. These apprehensions were not necessarily due to a lack of knowledge but reflected a cautious approach to their health, particularly in the context of existing health conditions. One participant expressed this sentiment, stating, *“With the PrEP I think, if you have some kind of underlying illnesses and all of that, it would give you complications”* (Group 1, Kumasi). Another participant reinforced these concerns, specifically referencing kidney health: *“Knowing right now that it affects the kidney, no, I would not want to take it, what if my kidneys fail?”* (Group 4, Accra).

The issue of cost was a concern raised by participants in one FG (Kumasi), who were worried that PrEP might be prohibitively expensive. Participants voiced worries that the expense associated with PrEP could render it financially inaccessible for many individuals. The perceived high cost of PrEP raised fears that it might pose a substantial barrier to access, potentially preventing a considerable portion of the population from benefiting from the medication. A participant succinctly captured this sentiment with the statement, *“The price may scare me from using it”* (Group 1, Kumasi).

Varied reasons for participant acceptability of PrEP

Amid these findings, select focus groups (three) highlighted potential determinants that could influence PrEP acceptability. Participants' motivations for considering PrEP usage encompassed various factors, including HIV prevention, addressing Hepatitis B concerns, maintaining intimacy in serodiscordant relationships, and navigating issues of trust within partnerships. Participants engaged in discussions regarding their readiness to embrace PrEP for HIV prevention, centering their considerations on personal safety and a strong desire to remain HIV-free. The conversations also underscored the added advantage of PrEP in treating Hepatitis B, which contributed to participants' inclination to opt for PrEP. This perspective is succinctly expressed by a participant's comment, *“the PrEP medication also treats Hepatitis B alongside, So I will use it”* (Group 1, Accra). Additionally, participants echoed their willingness to adopt PrEP, emphasizing its role in averting HIV transmission: *“Yes, I will use it because it will help me prevent HIV”* (Group 4, Kumasi). This sentiment was reinforced by participants who viewed PrEP as an additional safety measure: *“I think I would like to use it just to be safe”* (Group 2, Kumasi).

These shared viewpoints illuminate the multifaceted considerations that influence PrEP acceptability.

Several participants voiced a perspective that PrEP holds substantial value for HIV serodiscordant couples, as it enables a level of sexual intimacy that concerns about HIV transmission might otherwise hinder. This concern is particularly significant when the uninfected partner is uncertain about their partner's viral suppression or treatment adherence. These participants emphasized their anxieties about their partner's fidelity and commitment to monogamy. In response, they expressed a willingness to utilize PrEP as a means of self-protection against potential transmission risks. A participant explained: *"I would like to use it because being with my 'beef' and not knowing whether he is faithful, I would love to take it just to prevent myself from anything"* (Group 2, Accra). This viewpoint reflected a complex interplay between sexual health, trust within relationships, and PrEP acceptability.

Discussion

PrEP is a proven effective method for preventing HIV acquisition, particularly for individuals with high risk of being exposed to the virus [19]. Although PrEP was introduced in Ghana and other West African countries in recent years, there is limited understanding of its acceptability among Ghanaian MSM. This study provides qualitative insights into awareness, comprehension, and perspectives on the acceptability of PrEP uptake among MSM in Ghana. The findings contribute to shaping interventions to increase PrEP uptake and ultimately reduce HIV incidence in the country. The study observed that: (1) there was an almost universal awareness of PrEP, but inaccuracies about PrEP were common, and (2) a mix of individual and intrapersonal factors influenced PrEP acceptability.

While previous research, including our own, has identified low levels of PrEP awareness among MSM in Ghana, this study uniquely contributes to the literature by providing a deeper exploration of the specific factors influencing PrEP acceptability following the introduction of PrEP in the country. This research moves beyond merely assessing awareness to examining how the lived experiences and perceptions of MSM impact their willingness to use PrEP. The study reveals critical concerns such as the perceived burden of daily pill-taking, the stigma associated with being seen as living with HIV due to daily PrEP use, and the inadequacy of PrEP in preventing other STIs, which are crucial for shaping effective interventions. Furthermore, this research contributes to the global discourse on PrEP by offering a case study of PrEP acceptability in a West African context, where cultural, social, and structural factors uniquely influence HIV prevention strategies. This localized understanding

is essential for developing context-specific interventions that can be adapted and implemented effectively in similar regional settings.

Our previous research in Ghana found a low awareness of PrEP among MSM [10]. Our current results after the introduction of PrEP in Ghana indicate an almost universal awareness of PrEP among MSM. However, like other studies elsewhere, we observed a misunderstanding of the basics of PrEP, including its purpose, dosage, and effects [20–23]. For instance, in explaining their reasons for taking or not taking PrEP, many participants equated PrEP to PEP, indicating that PrEP is taken after exposure (which is PEP in true definition). They also described that there is no difference between PrEP and ARTs as they are both daily pills; however, while oral PrEP is based on the daily use of an ART combination, it is not a treatment for HIV. Additionally, their explanations suggest that they heightened fears of harm from taking PrEP medication, for example, side effects such as impaired kidney function and complications associated with pre-existing conditions. Whereas no other studies exist on PrEP among MSM after it was introduced in Ghana, our findings correspond with a study among sex workers in Ghana that shows that low knowledge of PrEP affected interest in its uptake [13].

Similar to Ahouada et al.'s [24] finding among MSM in Benin, MSM in this study held mixed individual and intrapersonal perspectives that inform the acceptability or unacceptability of PrEP. For those who accepted to take PrEP, they pointed to critical issues regarding known HIV risk behaviors such as multiple sex partnerships, low condom use, and general risk behaviors among MSM and sexual partners. As such, MSM finds PrEP a vital prevention option, as it will prevent them from contracting HIV even if their sexual partners are living with HIV. Those who indicated a lack of acceptability of PrEP cited factors such as the daily uptake of PrEP as inconvenient and not different from someone living with HIV and that PrEP does not prevent any other condition besides HIV. Hence, they do not think it's worth the inconvenience.

Participants demonstrated a preference for traditional prevention methods like condom use, which they perceived as more accessible and straightforward compared to PrEP. The convenience of condoms, their effectiveness against a broad spectrum of STIs, and the immediacy of their protection are factors that underscore their continued favorability within the MSM community. This preference is further rooted in the practical challenges associated with PrEP, such as the daily commitment to medication adherence and confusion over dosing schedules, which could potentially diminish its preventive efficacy if doses are missed. These concerns reflect a broader need for clear, practical guidance on PrEP use to ensure

that it becomes a more user-friendly option for those at high risk of HIV exposure.

The participants' concerns about the burden of daily PrEP use and its inability to prevent other STIs suggest a need to explore alternative PrEP strategies in the future. Potential options include on-demand PrEP (PrEP 2-1-1), doxycycline post-exposure prophylaxis (doxy-PEP) for STI prevention, and long-acting injectable PrEP such as Apretude (cabotegravir). However, these alternatives are not yet widely available or incorporated into national HIV prevention guidelines in Ghana. The use of doxycycline post-exposure prophylaxis (doxy-PEP) for preventing bacterial STIs has shown promising results in reducing the incidence of certain STIs, such as syphilis and chlamydia, among high-risk populations [25]. However, its implementation in African settings remains limited. Further research is needed to assess the acceptability and feasibility of these alternatives within Ghana's healthcare system before considering their potential inclusion in national guidelines.

One of the primary barriers identified by participants in this study is the perceived and actual cost associated with obtaining PrEP. While some facilities provide PrEP at no cost through donor-funded programs, others charge a fee, typically around 30 Ghanaian cedis (approximately equivalent to \$2.00 USD), creating financial barriers for individuals who may already face economic hardships. Currently, PrEP access in Ghana is not directly funded by the government but rather supported by international donor organizations, such as PEPFAR and the Global Fund, which provide PrEP to selected healthcare facilities. This fragmented availability leads to inconsistencies in access, resulting in misinformation and uncertainty among potential users about whether they can afford or obtain PrEP when needed. Participants' concerns highlight the urgent need for clearer communication and policy alignment to ensure uniform access to PrEP services across the country.

A noteworthy issue is the extension of HIV stigma, medication stigma, and sexual stigma to PrEP and the potential for such stigmas to affect PrEP uptake [26, 27]. The participants in this study indicated not taking PrEP because it will be equated to HIV treatment if others see it. Hence, others will avoid them because they assume they are living with HIV, thus expressing a fear (anticipation) of HIV stigma if using PrEP, which affects willingness to take PrEP. Some participants do not want to be associated with PrEP because it will be assumed that they are engaging in same-sex relationships and sexual activities, especially if they must go to a healthcare setting for PrEP. Similar to reasons provided in our previous studies for not testing for HIV in healthcare facilities [28], participants expressed fear of disclosing their sexual behavior at healthcare facilities during PrEP enrolment. The fear

of disclosure is expected as many Ghanaian MSM have expressed strong reservations about confidentiality in facilities in several studies [15, 28–31]. This echoes previous findings elsewhere that stigma and discrimination associated with HIV and sexuality play a significant barrier to PrEP uptake among MSM [32, 33]. For instance, a study conducted in West Africa found that societal attitudes toward homosexuality significantly hindered PrEP uptake among MSM [27, 34]. Similarly, a study in Thailand found that cultural norms and taboos surrounding same-gender sexual behavior were significant barriers to PrEP uptake among MSM [35]. Addressing these complex issues is essential for improving PrEP awareness and uptake among MSM in Ghana.

The participants highlighted the importance of upscaling comprehensive PrEP education among MSM in Ghana to tackle areas such as dosage, side effects, and general information about PrEP. They recognized the lack of understanding of PrEP among themselves and other Ghanaian men who share similar sexual histories despite its potential to reduce HIV acquisition. This finding supports previous calls for the scale-up of interventions to address PrEP uptake among men who may be exposed to HIV through sexual contact with other men [36–39]. Although research on interventions to promote PrEP use among MSM is limited, recent studies have explored the use of social networks to improve PrEP initiation and other forms of HIV prevention in this population. These interventions have aimed to leverage the power of social networks to increase awareness, promote education and reduce barriers to accessing PrEP and other forms of HIV prevention [38, 39]. We encourage researchers and HIV prevention program implementers to explore these approaches, considering that it has been successful in previous studies in reaching MSM for intersectional stigma, HIV prevention, and testing interventions in Ghana [16, 31, 40, 41] and has been successful in contributing to an increase in PrEP uptake elsewhere [42, 43].

Strengths and limitations

A major strength of this study is its pioneering role in examining the knowledge, awareness, and acceptability of PrEP among MSM in Ghana following its introduction. This timely research fills a critical gap in the literature by providing fresh insights into the perceptions and experiences of this key population at a significant juncture in the local HIV prevention landscape. The qualitative design allows for an in-depth exploration of individual and collective attitudes toward PrEP, capturing the complexities and subtleties of these perceptions. Engagement with MSM through advocacy organizations offers informed perspectives that may indicate a higher baseline understanding of PrEP-related issues. The study's limitations, however, must be acknowledged. It focuses

solely on oral PrEP, overlooking the nascent but potentially transformative role of injectable PrEP, which could offer alternative adherence models and convenience. The recruitment strategy, centered on connections with advocacy organizations, may limit the representativeness of the sample, potentially excluding the voices of those with less support or awareness about PrEP. With a modest focus group size and a lack of comprehensive sociodemographic data, the ability to extrapolate these findings to the wider MSM population in Ghana is limited. Future research should consider systematically collecting demographic data to provide a more complete understanding of the sample and to facilitate comparisons across different subgroups. While this study provides qualitative insights into the acceptability and uptake of PrEP among MSM in Ghana, limited publicly available quantitative data exist to enable direct comparison. Current programmatic data on PrEP uptake remain scarce, highlighting the need for improved surveillance and data reporting to inform targeted interventions and policy decisions. Future research should incorporate both qualitative and quantitative approaches to develop a more comprehensive understanding of PrEP utilization trends among key populations. Despite this limitation, the study's eligibility criteria ensured that all participants were 18 years or older and self-identified as MSM, which provides some assurance of relevance to the target population. Furthermore, the absence of a quantitative measure constrains the ability to assess the prevalence of the observed attitudes and knowledge gaps, which would be beneficial for public health planning and intervention design. Given the recency of PrEP's introduction in Ghana, the study does not capture longitudinal data, which would provide insights into the evolution of PrEP knowledge and attitudes over time, as well as the impact of ongoing educational efforts.

Conclusions

PrEP stands as a pivotal intervention for the prevention of HIV, with clear efficacy for those at substantial risk of contracting the virus. Its introduction in Ghana and other regions of West Africa marks a crucial step in broadening HIV preventive measures. However, our understanding of its acceptability among Ghanaian MSM remains nascent. This study contributes qualitative insights into the awareness, knowledge, and acceptability of PrEP among this group. The increased understanding gained here is instrumental in shaping targeted interventions to enhance PrEP uptake, which could play a significant role in reducing HIV incidence in Ghana. In light of these findings and limitations, future research should include an examination of the acceptability and feasibility of injectable PrEP among MSM in Ghana. As the healthcare landscape evolves to potentially include injectable

options, understanding preferences and barriers to this modality will be crucial. This knowledge could inform the development of tailored interventions that accommodate the specific needs and preferences of this high-risk population, ultimately contributing to a more effective HIV prevention strategy in Ghana and similar contexts.

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Author contributions

The authors confirm contribution to the paper as follows: study conception and design: LEN, LN, and KT; data collection: AA, GRA, RPAU, PAA, SA; analysis and interpretation of results: GAF, EZ, GRA, LN, LEN; draft manuscript preparation: GAF; Manuscript review and finalization: GAF, GRA, AA, LN, KT, LEN. All authors reviewed the results and approved the final version of the manuscript.

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Data availability

The qualitative data illustrating the findings of the study are presented as participants' quotes within the paper. The raw datasets used and/or analyzed during the current study are not publicly available due to our ethical and legal requirements for protecting participant privacy and current ethical institutional approvals but are available from the corresponding author on reasonable request pending ethical approval. The publishing of the raw data set is limited due to the high risk of persecution and severe adverse social consequences related to the socio-political sensitivity of the topic of same-sex behaviors in Ghana.

Declarations

Ethics approval and consent to participate

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the institutional review boards of the Noguchi Memorial Institute for Medical Research (CPN 016/19–20), Ghana Health Service Ethics Review (GHS-ERC 014/10/19), Yale University (2000025917), and the University of Toronto (00038738). Informed consent was obtained from all individual participants included in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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