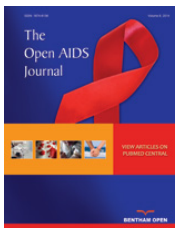

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RESEARCH ARTICLE

Pre-Exposure Prophylaxis (PrEP) in Men Who have Sex with Men in Bouaké, Côte d'Ivoire: A Qualitative Evaluation of Acceptability

Sara Jeanne Pelletier[1], Marie-Pierre Gagnon[1], Souleymane Diabaté[1,2], Ouffoué Kra[2], Yadjoro Josué Biékoua[3], Gbahonnon Dorothée Osso[3], Bamourou Diané[2], Méliane N'Dhatz-Ebagnitchié[2], Carin Ahouada[4] and Michel Alary[1,*]

[1]*Centre de recherche du CHU de Québec-Université Laval, Québec, QC, G1S 4L8 Canada*
[2]*Université Alassane Ouattara, Bouaké, Côte d'Ivoire*
[3]*Renaissance Santé Bouaké, Bouaké, Côte d'Ivoire*
[4]*Centre National Hospitalier Universitaire de, Cotonou Benin*

Abstract:

Background:

HIV remains an important public health issue throughout the world. In Côte d'Ivoire, a high burden of HIV is observed in men who have sex with men (MSM).

Objective:

We assessed the acceptability of Pre-Exposure Prophylaxis (PrEP) among men who have sex with men (MSM) in Bouaké, Côte d'Ivoire.

Methods:

We conducted and analysed four focus groups with 31 HIV-negative MSM and eight in-depth individual interviews with participants recruited from the focus groups.

Results:

Four MSM (13%) were aware of PrEP before participating in the study. All the participants were interested in taking PrEP if available: 19 (61.3%) would prefer the daily regimen and 12 (38.7%) would opt for the on-demand regimen. Many advantages of PrEP were mentioned: protection in case of a condom break, protection in case of high-risk sexual behaviour, self-reliance, decreasing HIV fear and ease of use. Barriers to the use of PrEP included: it does not protect against other Sexually Transmitted Tnfections (STIs), taking a pill regularly is necessary, the size of the pill, possibility of side effects, the cost and accessibility. Six participants (19.3%) admitted that they would use condoms less if they take PrEP.

Conclusion:

Findings indicate that PrEP is acceptable within the MSM community. Implementation should be done rapidly, and PrEP should be part of a global prevention program which includes counselling, STI screening and promotion of safe sex practices. Health authorities should consider PrEP for all high-risk groups to avoid worsening stigmatization by targeting MSM only.

Keywords: PrEP, HIV, MSM, Côte d'Ivoire, Acceptability, Prevention.

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1. INTRODUCTION

Despite progress in the last decades, Sub-Saharan Africa (SSA) remains the region of the world that carries the highest burden of HIV. While SSA had only 14% of the global population in 2017 [1], it accounted for 65% of all new HIV infections, 70% of all people living with HIV, and 70% of all deaths from AIDS-related illnesses reported worldwide [2]. In SSA, during the last decades, efforts have been mainly concentrated to reduce the incidence and prevalence of HIV within the heterosexual population [3 - 5]. However, it is now well known that men who have sex with men (MSM) in SSA

* Address correspondence to this author at the Centre de recherche du CHU de Québec – Université Laval, 1050, Chemin Sainte-Foy, local H0-02, Québec, Qc, G1S 4L8, Canada; Tel: 1-418-525-4444 p.87387; Fax: 1-418-682-7949;
E-mail: michel.alary@crchudequebec.ulaval.ca

have an HIV prevalence and incidence significantly higher than in the general population and that they contribute to transmission to women [6, 7]. In addition to the social stigma surrounding homosexuality [5, 8], the fact that MSM have not been identified as a key population in SSA earlier has contributed to the current lack of specific services for this population.

Côte d'Ivoire is the second West African country with the highest HIV burden, with an estimated HIV prevalence of 2.7% [IC 2.2-3%] in 2016 [9]. Despite a decline in the general population during the last decade, HIV prevalence remains high within key populations, including MSM. In 2015, the *Joint United Nations Programme on HIV/AIDS* (*UNAIDS*) estimated that HIV prevalence was 11.2% among MSM in Côte d'Ivoire [10]. The stigmatization towards MSM in this country contributes to the lack of targeted health services and predisposes these men to high risk sexual behaviours [11, 12]. Although homosexuality is not illegal in Côte d'Ivoire [10], MSM still experience social stigmatization and discrimination [6, 13]. Several MSM hide their sexual orientation and do not disclose their homosexual activities to health care professionals, which limits their access to HIV prevention and treatment [14].

Pre-exposure prophylaxis (PrEP) is an effective prevention method to reduce the risk of HIV infection and it has been proven effective for MSM in randomized clinical trials [15 - 17]. In 2015, the World Health Organization (WHO) recommended PrEP for all key populations at substantial risk of HIV infection, including MSM [18]. The success of PrEP involves issues such as treatment adherence, medical follow-up and socio-cultural acceptance [19 - 21]. Accordingly, information on the determinants of acceptability and feasibility of this method is needed in countries like Côte d'Ivoire that are considering its implementation among MSM. To our knowledge, no data about the acceptability of PrEP by the MSM population in Côte d'Ivoire was available before the beginning of our study. To fill this gap, the study explored, through a qualitative methodology, different factors that may influence PrEP acceptability and risk-taking behaviour among MSM. The study aimed at widening current knowledge by using behaviour change theory to inform the development of a tailored PrEP program in Côte d'Ivoire.

2. METHODS

2.1. Study Design, Setting and Population

The focus of this paper is the qualitative component of a larger qualitative and quantitative cross-sectional study conducted in 2018 in Bouaké, the second largest city of Côte d'Ivoire. The qualitative study was organized into four focus groups and eight individual in-depth interviews with MSM. Men identifying themselves as MSM and living in the city of Bouaké, its surroundings and the Gbèkè region (central Côte d'Ivoire) constituted the study population. Men were eligible to participate if they were born male, aged 18 or older, declared being seronegative for HIV, reported having at least one anal sexual intercourse with a male partner during the last 12 months and were able to understand the information provided on the study and to sign the consent form. All focus groups and in-depth interviews took place in the office of Renaissance Santé Bouaké (RSB), a Non-Governmental Organization (NGO) whose mission is to prevent HIV transmission and to help people living with HIV improve their quality of life. Since 2008, RSB has extended all its activities to MSM.

2.2. Recruitment and Sampling

Focus groups participants were recruited by MSM community leaders who had strong connections within the MSM networks. Community leaders were instructed to recruit adult men from different age groups, socio-economic classes and education levels in order to represent as much as possible the MSM community. Thirty-two MSM were recruited and four focus groups were conducted. The first group had eight participants, the second and third groups had nine participants each and the last group had six participants. One participant was excluded from data analysis since he was under 18 years of age. Thus, 31 MSM were included in the qualitative analysis.

Two MSM were selected from each focus group by the study team for an in-depth individual interview. The selection was based on the contribution of the participants to the group discussions and the relevance of their comments and statements during these discussions. A total of eight in-depth interviews were conducted.

2.3. Conceptual Framework

The Theoretical Domains Framework (TDF), developed by Michie and collaborators, was used to generate the interview guides and to carry out the thematic analysis of the data. The TDF is a synthesis of 33 behavioural theories. From these 33 theories, 128 constructs were identified from which the most relevant for behaviour changes were included . In the latest version of the TDF, 14 domains are identified [22, 23]. This framework helps in understanding behavioural changes by exploring their determinants. It provides useful information to design interventions. It was used in this study to explore health behaviours related to PrEP and to widen current knowledge on PrEP in Côte d'Ivoire.

In this study, six domains were explored during focus groups and in-depth individual interviews: knowledge, reinforcement, social influences, intentions, beliefs about capabilities and behavioural regulation. Knowledge explores participants' awareness of PrEP and other HIV prevention methods. Reinforcement domain refers to all the factors that can either increase or decrease participants' motivation or interest to use PrEP. The domain of social influences explores all interpersonal processes that can cause individuals to change their thoughts, feelings or behaviours. Intention refers to a «conscious decision to perform a behaviour [22]. Beliefs about capabilities are related to participants' self-confidence about their capability to use PrEP as prescribed. Behavioural regulation domain explores anything aimed at managing or changing objectively observed or measured actions [22] and was used to evaluate participants' anticipated sexual behaviour changes with PrEP.

2.4. Data Collection Process

The focus groups and the individual interviews were conducted by the first author. These interviews were semi-structured using an interview guide based on the TDF as described above. The interviews were recorded with a digital device after obtaining verbal consent from all the participants. Interviews were conducted in French, but a few participants preferred to give their answers in local languages. A facilitator was present during the focus groups to translate into local language if needed.

2.5. Data Analysis

The interviews were transcribed verbatim by research team members with experience in qualitative research. A few participants used local languages to express themselves, in which case these excerpts were translated by a member of the study team fluent in both French and the local language. After verification by the researchers, the transcripts were imported in N'Vivo 12, a software that allows to manage and analyse qualitative data [24]. Data were codified and analysed through a thematic content analysis that is appropriate to identify key elements, contradictions and recurrences between participants [25]. The first codification was done by the first author and then reviewed by one of the co-authors (MPG) with extensive experience in qualitative research. Codifications or interpretation discrepancies were discussed by the research team to reach a consensus.

3. RESULTS

3.1. Socio-Demographic Characteristics of Participants

A total of 31 MSM were included in the analysis (Table **1**). The mean age of the participants was 27 years, with a majority of participants (77%) younger than 30 years of age. Islamism was the most represented religion (68%) followed by Christianism (26%). A majority of participants (77%) were members of an MSM association. Twenty-two participants (71%) had at least one relative knowing their MSM status, but only friends were concerned for fifteen of them. Thus, a minority (23% of all participants) revealed their status to a family member. Sixteen participants (52%) described their sexual preference as homosexual, fourteen (45%) as bisexual and one (3%) as heterosexual.

Table 1. Characteristics of 31 men who have sex with men (MSM) participating in a qualitative study of Pre-Exposure Prophylaxis acceptability, Bouaké, Côte d'Ivoire, 2018

	***n* (%)**
Mean age in years [SD]	26.6 [8.3]
< 20	6 (19)
20-24	4(13)
25-29	14 (45)
30-39	4 (13)
40-49	2 (6)
≥ 50	1 (3)
Marital status (in relation with a woman)	
Married	2 (6)
Cohabiting with a woman	4 (13)
Not married or cohabiting with a woman	22 (71)
No response	3 (10)
Relationship status	
Single	10 (32)
In a relationship with a man	8 (26)
In a relationship with a woman	4 (13)
In a relationship with a woman and a man	9 (29)
Highest education level achieved	
Non-educated	5 (16)
Primary school	5 (16)
Secondary school	12 (39)
Higher than secondary school	9 (29)
Employment status	
Student	14 (45)
Salaried employee	1 (3)
Craftsman / Merchant	9 (29)
Unemployed	1 (3)
Other	6 (19)
Religion	
Traditional	1 (3)
Christianism	8 (26)
Islamism	21 (68)
No religion	1 (3)
Member of an MSM association	
No	7 (23)
Yes	24 (77)
MSM status known by at least one relative	
No	9 (29)
Yes	22 (71)
Type of relative who knows status*	
Father	1 (5)
Mother	3 (14)
Brother or sister	5 (23)
Friend	22 (100)
Woman partner	2 (9)
Cousin	1 (5)
Sexual preference	
Homosexual	14 (45)
Bisexual	16 (52)
Heterosexual	1 (3)

*Applied to the 22 MSM who answered yes to the question: Does at least one relative knows your MSM status? These answers are not mutually exclusive; SD, Standard deviation.

3.2. Knowledge

Participants' knowledge about HIV prevention methods seemed to be mainly limited to condom use. In every focus group and interview, it was the prevention method that was mentioned the most frequently. During focus groups, three participants also mentioned abstinence, one cited faithfulness to the partner, two mentioned regular HIV screening test and two mentioned PrEP. During the in-depth interviews, only one additional method was mentioned: being careful with sharp objects to prevent cuts.

Most participants stated that they use condoms during

sexual intercourse, but some admitted that they do not use it every time. The reasons mentioned for not using a condom were: disliking condom use, having a partner who dislikes condom use, having an unexpected intercourse, not having a condom at disposal, having a steady partner and trusting him, knowing the HIV status of the partner and using alcohol before sexual intercourse.

The majority of the participants were not aware of PrEP before their participation in this study. Out of the 31 participants in the focus groups, only four (12.9%) had heard of PrEP. Channels by which they heard about PrEP were friends, social media and television.

3.3. Reinforcement

3.3.1. Advantages and Incentives

Many advantages and incentives of using PrEP were mentioned by participants. The most frequently mentioned advantage of PrEP was to avoid HIV infection. Also, many considered that PrEP would be reassuring in case of condom breakage. High-risk sexual behaviours were another incentive for many to use PrEP. For example, regarding condom use, some participants admitted that they did not personally use it, or at least not always. Since they are aware of their risk to contract HIV, PrEP would be an interesting option, allowing them to reduce their risk exposure and to meet their sexual preference.

« *So me personally, I don't like to use condoms. That's it, I don't like to use it so I think that PrEP is a new method that will help me, that will keep me safe because I've been exposed despite knowing the risks.*» (Participant #19, Focus group)

For some participants, PrEP was seen as a method that promotes an individual's self-reliance since the use of PrEP is independent of the partner's will, unlike condom use. Condom use requires a mutual agreement between the sexual partners while PrEP is a strictly personal decision. Partners' reluctance to use condoms seemed to be a regular issue for several participants. PrEP would protect them against HIV infection despite partner's refusal to use a condom.

For some MSM, PrEP would be reassuring in case of doubt about their partner's fidelity. Also, one participant confessed his own occasional infidelity and he was aware of the risk taken when having multiple partners. For him, PrEP would be a way to feel safer when having these risky behaviours. Moreover, unawareness of partner's HIV status was another incentive to take PrEP.

Tables **2** and **3** summarize the main elements that were discussed concerning reinforcement with verbatim examples to illustrate their answers.

Table 2. Summary of incentives and advantages of Pre-Exposure Prophylaxis (PrEP) reported by 31 men who have sex with men, Bouaké, Côte d'Ivoire, 2018

Avoiding HIV infection		« […]it will save us from having HIV which is everywhere now in the community. And it will, if I can say, stop many HIV contaminations. » (Participant #1, Focus group)
Protection in case of a condom breakage		« […] condom is not reassuring. It can break or leak out and… But when I use PrEP and I use condoms, then it is safe.» (Participant #9, Interview)
Protection in case of high-risk sexual behaviour	Unknown HIV status of sexual partner	«It will protect us with many diseases because often we are with someone and you are serious, but maybe the person is not serious, and he can give you the disease because you didn't know he was infected. » (Participant #17, Focus group)
	Not using condom	« For me, what can encourage me to use PrEP, it is to first protect myself, because now it is not every partner that like to use condoms. » (Participant #1, Focus group)
	Doubt about sexual partner's fidelity	«[…] you cannot know your partner's faithfulness, because the partner can tell you « I'm faithful », but you can't know for sure, because you are not together all the time. So I think that taking PrEP is a good thing and a good way to avoid HIV. » (Participant #29, Focus group)
	Personal infidelity / multiple partnership	«It is true that we say we are faithful and everything, but it happens sometimes when you go out and you see a beautiful man, so you cannot refrain yourself and it makes you do things. So if I know I'm going to a party, I take PrEP and I go. In case where I have an occasion, I go for it and I know that there is no risk taking. » (Participant #16, Focus group)
Autonomy / self-reliance		« The advantages to use PrEP is that it allows us to be self-reliant. When I say self-reliant, [I mean] not being afraid of intercourses, because the partner, I don't know, I am not aware of his status. […] it will make us responsible […]. Because just deciding to use PrEP it is being responsible for myself. » (Participant #16, Interview)
Decreasing HIV fear		« I know that PrEP makes me healthy, because I am afraid of HIV. » (Participant #29, Interview)
Increasing trust in partner		« […] I'm happy to know that PrEP can lead to trust in couples, in relationships.» (Participant #18, Focus group)
Ease of use		« I think it is an easy method» (Participant #14, Focus group)

Table 3. Summary of consequences, barriers and incentives of Pre-Exposure Prophylaxis (PrEP); a qualitative study among 31 men who have sex with men (MSM), Bouaké, Côte d'Ivoire, 2018

PrEP does not protect against other STIs	« So, for me, something that can drive me not to use this medication, it's because it isn't 100% effective to protect men. When I say 100%, I mean that there are other diseases, beside HIV, there are other diseases such as gonorrhea, STIs. » (Participant #19, Focus group)

(Table 3) contd.....

Having to take a pill regularly		«A disadvantage is having to take PrEP continuously. Me in particular, it bothers me a little because I am this kind of guy, I hate pills. » (Participant #16, Focus group)
Size of the pill		« And the tablet volume! It scares me, the tablet size is very important to me. When I see the pill, if it is big, it even scares me more. » (Participant #16 Focus group)
Side effects and long term effects		«So, a disadvantage, it is not easy to say because I haven't used it yet. But I don't know, if there are, if used for an extended period of time, if it can drive other things. » (Participant #27, Interview)
Accessibility	Geographical accessibility	«Something that could refrain me from using PrEP is accessibility because, me particularly, I am in a neighbourhood remote from city center» (Participant #16, Focus group)
	Accessibility to the centers that delivers PrEP	« You see, there are MSM who are reluctant to come here at RSB. […] they think that they will be seen by people here, they are afraid that others say "yes I saw him at RSB so he is gay". That's it, so it is a little complicated. » (Participant #32, Interview)
Cost		« First, if PrEP is available, I would normally like that it is free. Because not everyone is able to afford to buy it. » (Participant #1, Focus group)
Infidelity, multiple partnership		« The only reason that could push me to not use this medication is multiple partnership. But in case where I am faithful, I only have to beware of HIV, because I know that STIs, I won't have it. » (Participant #27, Focus group)
Fidelity, trust in partner		« Me, what could drive me not to use this medication is my faith in my partner first, that is to say fidelity» (Participant #31, Focus group)

STIs, Sexually transmitted infections; RSB, Renaissance Santé Bouaké (a non-governmental organization)

3.3.2. Consequences and Barriers

Although six participants had no worries about using PrEP, some downsides of PrEP were mentioned during the discussions. A disadvantage mentioned by the participants was that PrEP only protects against HIV infection. For some MSM, the fact that PrEP does not protect against other sexually transmitted infections (STIs) is a downside because it means that they would still have to use a condom to protect themselves against other STIs.

For one participant, having to take a pill regularly was an obstacle. For him, the size of the tablets was also very important. Several participants were concerned about the side effects and long-term effects of PrEP in general.

The distance to the distribution center was often seen as a potential barrier to use PrEP. Some participants often had to leave the town for work or other personal activities, so they were concerned about how they would have access to PrEP outside of Bouaké. They considered that a distribution network should be deployed all over the country to provide them with easy access to PrEP.

« *Me, personally, what could refrain me from using PrEP is maybe if I am out of town, because I am someone active, I'm always away. I mean the distance. If I get PrEP in a center in Bouaké and I am out of town, I don't know other places outside the city where to go get my PrEP so it can be problematic.* » (Participant #14, Focus group)

Concerning geographical access to PrEP, a few MSM also mentioned that it was an important issue even inside the city of Bouaké. Some live in the suburbs of Bouaké and the NGOs dedicated to MSM's care are relatively far from their homes. To take into account this issue, a participant suggested implementing a mobile delivery unit that could reach the remote neighbourhoods. This participant also raised the issue that some MSM never go to the NGOs dedicated to this population. These MSM are afraid that they might be seen there and that the community will talk about their homosexuality.

For two participants, fidelity to their partner would encourage them not to use PrEP. For them, fidelity makes them feel safe and they consider that they would not be at risk of contracting HIV infection in a relationship with a faithful partner. For another participant, fidelity to the partner is rather an incentive to use PrEP because he considers that in this case, he only has to beware of HIV and not of other STIs. If he has multiple partners, he prefers to use condoms because PrEP does not protect against the other STIs.

For most participants, the cost of PrEP is an important issue and could be a major barrier for MSM to have access to PrEP. A majority thought that PrEP should be free in order to reach a maximum of MSM interested in using it.

3.4. Social Influences

3.4.1. Society, Family and Relatives' Perceptions about PrEP

Participants were asked how they thought the Ivorian population, their family and their relatives would perceive this new HIV prevention method. Most participants thought that PrEP will be well perceived in general by the population and their relatives. Many put emphasis on the importance of increasing awareness and of setting up an information campaign for the general population about PrEP to facilitate its acceptance.

To have a deeper understanding of participants' perceptions on this topic, participants were asked during in-depth interviews about how they thought PrEP would be perceived by society if it was intended for high-risk populations only. Six out of eight participants believed that the population would be unfavourable to PrEP if it targets only high-risk groups including MSM.

« *So if they target specific groups of people first, [the population] won't appreciate, because it should be for everyone, not for one specific group. Well, this is my opinion, they won't appreciate it because it is a medication that can save people, save lives and this should not be for a group of people, it should be for everybody.* » (Participant #19, Interview)

Some participants were also concerned that, if PrEP is only

available for high-risk groups, they would have to hide to obtain and to use PrEP, because many MSM in Côte d'Ivoire do not declare their status to their relatives.

« *If PrEP is targeted for MSM only, really this will make things a little difficult. [...] because to obtain PrEP, we will have to hide, we will not be able to do it freely like with other medications.* » (Participant #27, Interview)

Also, some participants were worried about their family's reaction to PrEP. In fact, these participants were worried about their family's reaction to their homosexuality rather than to their PrEP use. They were afraid that their parents or relatives will suspect them to be homosexual if they learn about their PrEP use.

3.4.2. Stigmatization and Discrimination

All participants agreed that stigmatization towards MSM was real in Bouaké and in Côte d'Ivoire. Most of them reported that the situation was very challenging for them. However, some participants never experienced stigmatization themselves, usually because their relatives and neighbours were not aware of their MSM status and because they were not effeminate. It seemed that being effeminate was an important determinant of stigmatization.

Most participants admitted that they hide their MSM status to their family. For some, it was a possibility to be disowned by their family if they discovered their homosexuality. To avoid discrimination, it was often mentioned that MSM need to know how to behave or to know how to control oneself. These expressions refer to hiding their homosexuality by avoiding effeminate behaviours.

Some participants mentioned that stigmatization even exists inside the MSM community. It appears that it is quite frequent to see people who are MSM themselves insulting, stigmatizing or even using violence towards other MSM. They might do it to avoid being stigmatized themselves or to convince their relatives that they are not homosexuals. Some focus group members confessed that they previously did insult or stigmatize other MSM to avoid being stigmatized themselves.

One participant reported that discrimination goes beyond interpersonal relationships and that they experienced exclusion in public institutions such as hospitals or within the judicial system.

3.4.3. Impact of Stigmatization and Discrimination on PrEP Utilization

Most of the participants said that stigmatization would not stop them from taking PrEP. Some said that they will simply hide their use of PrEP to their relatives. Others rather intended to talk to their relatives about PrEP to raise awareness about this prevention method. Many participants thought that their relatives will approve their intention to use PrEP. However, for two participants, stigmatization could be a potential barrier to the use of PrEP because they fear a potential increase in their own social exclusion. Table **4** resumes participants' perceptions of stigmatization and its anticipated impact on their PrEP use.

Table 4. The extent of stigmatization and its anticipated impact on PrEP use among men who have sex with men (MSM), Bouaké, Côte d'Ivoire

The extent of stigmatization in MSM lifes	
Impact of stigmatization on the capability to be oneself	« It is not easy because you cannot live fully with your sexual identity. I mean you can't be who you are because today [homosexuality] is perceived badly. Some people say it is an abomination.» (Participant #16, Interview)
Effeminate behaviours as a determinant of stigmatization	« It is difficult to bear because we are being assaulted everywhere we go. Not mainly because we are gay, they don't know we are gay, but because we are effeminate. There are some gays who are not effeminate, but they are not stigmatized. […] So, I think that discrimination is really difficult to bear in Côte d'Ivoire because they beat us, they see us walking like a girl, […] they hate it so when they see you walking like a woman […] they don't think twice, they hit you. Walk like a man you are a man, that's it.» (Participant #9, Interview)
Impact of stigmatization within the family	« It is really complicated, mostly when you are under the authority of your parents. It is complicated because you dependent on them. If they learn [about your homosexuality], you can be denied, they can send you somewhere where you won't be able to do what you want. You can forget your convictions, you can forget the dreams you had.» (Participant #32, Interview)
Stigmatization between MSM	« There are some people who are not effeminate but are gay and who don't accept to see effeminate men going out in the streets. These people join homophobic people and hit or insult other gays. It is not nice to see.» (Participant #31, Focus group)
Stigmatization in public institutions	«I think that, talking about stigmatization, we are stigmatized on every aspect. I mean, the look, you are seen badly, you are badly approached, you have a problem and you want justice and you are not taken in charge, or you are sick and go to the hospital and you are not taken in charge. I think that on every aspect, MSM are stigmatized, they are isolated from the society, they are put away» (Participant #14, Focus group)
Anticipated impact of stigmatization on PrEP use	
No impact on PrEP use	« I think that, even if I'm insulted, hit, denigrated, blacklisted, I will take PrEP if it is available in Côte d'Ivoire, I will use it because it prevents from HIV.» (Participant #29, Interview)
Impact on PrEP use	« […] if someone sees you taking the medication, he can say […]: "those are gay pills you are taking". […] It can be a barrier to PrEP use. […] So these stigmatizations can be an obstacle to PrEP use I think.» (Participant #16, Focus group)

3.5. Intentions

Intention to use PrEP was very high in our study: all thirty-one participants said that they had the intention to use PrEP if it was available in Côte d'Ivoire. We also wanted to know how they wanted to take PrEP, considering that there are two different ways to use it: daily (one pill each day) or on-demand (one pill 2 to 24 hours before sexual intercourse and one pill 24 to 48 hours after). Nineteen out of the 31 participants (61.3%) would prefer the daily regimen and 12 participants (38.7%) would opt for the on-demand regimen.

Reasons given to justify the choice of the daily regimen were: feeling more protected, being protected at all times, having a better health, having frequent or daily sexual intercourses, having unexpected sexual intercourses, the fear of forgetting pills with on-demand method and acquiring a routine that facilitate the proper use of PrEP.

Reasons given to justify the choice of on-demand regimen were: the fear of side effects, the dislike of taking pills, feeling more protected, the practical side of this method, not having frequent sexual intercourses, having planned sexual intercourses only and the fear of forgetting to take pills with the daily regimen.

Participants were then asked how they would like the PrEP distribution process to be if it was available. They were asked to comment on the price of the medication and the distribution procedures. A majority considered that PrEP should be free. Many affirmed that a lot of MSM could not afford to pay for PrEP if it was not free. A few participants said that they were willing to pay, but only if the price was very low. Opinions about the frequency to obtain the medication varied from each week to every three months. The most frequent response was each month. About the place where to get PrEP, many would prefer to get it in the NGOs dedicated to MSM such as RSB because it is a place where they feel comfortable.

« *[…] because at RSB, we can come in, we feel comfortable because they welcome us well, they chat with you. When you come in, you feel like you are in another world because there is no, they don't say "this person is this or this person is that".* » (Participant #29, Interview)

Some of the participants would prefer to get their medication at the pharmacy. Some would like to obtain their drugs from supermarkets or shops. A participant suggested to implement mobile units to deliver PrEP directly to those who live in remote neighbourhoods. Another participant insisted on the importance of a confidential distribution of PrEP, or else many MSM will not be prone to use it.

3.6. Beliefs about Capabilities

Personal confidence about the capacity to take PrEP properly was explored. Out of 31, only two participants mentioned that they felt at risk to forget pills occasionally.

« *So what is a problem for me it is, [the pill you have to take] 24h after the sexual intercourse. One can easily forget it. Two hours [before the intercourse] it's understandable, but 24h after, one can easily forget. […] it is a concern for me, […] you have to be really good not to forget it.* » (Participant #19, Interview)

Other participants did not express any concern about the possibility to forget pills or to not take them at the right time. Some participants shared ways to remember to take their medication: putting an alarm on their cellphone, asking a friend to remind them to take PrEP or leaving the pills on the kitchen table to see it at breakfast.

3.7. Behavioural Regulation

Many participants affirmed that PrEP would have no influence on their sexual behaviours: they believe they would not have more partners and more intercourses or use less the condoms if they use PrEP. Still, six participants (19.4%) admitted that they would use condom less if they take PrEP.

« *So for me it will allow me to not use condoms because we can't stand it, condom delays ejaculation.* » (Participant #13, Focus group)

Six other participants admitted that they would have more sexual intercourses if they use PrEP. Some participants, even if they did not predict any sexual behaviour change for themselves, anticipated an increase of high-risk sexual behaviours within the MSM population with the advent of PrEP.

« *[…] we know that MSM like multiple partnerships. […] So, when this medication becomes available, then it will be, if I can say, 100% prostitution. Because they will say, since this pill is there, and I can't contract this disease, I feel protected. But this is not so simple, they forget that there are others STIs. So, for me, I think that with this medication, there will be a lot of sexual libertinisms.* » (Participant #1, Focus group)

4. DISCUSSION

This theory-based qualitative study aimed to assess the acceptability of PrEP for MSM in Bouaké, Côte d'Ivoire in order to inform the development of a tailored PrEP program for this population. Six major domains of the TDF were used to explore the potential determinants of PrEP use: knowledge, reinforcement, social influences, intentions, beliefs about capabilities and behavioural regulation.

The results indicate that there is a high level of PrEP acceptability within the MSM population in Bouaké. All the study participants showed interest in using PrEP. In an article published after the beginning of this qualitative study, a high proportion of MSM living in Côte d'Ivoire (80%) were also interested in taking PrEP [26]. Concerning the two different ways to use PrEP, a majority preferred the daily regimen. However, a considerable proportion of the participants (38.7%) would prefer the on-demand regimen, which suggests that every person should be allowed to choose the option that best fits his daily life.

Even if a general positive perception of PrEP emerged from the discussions, negative aspects or barriers were also mentioned. To our knowledge, no behavioural study about barriers of PrEP in West African MSM has been published to date, but the barriers mentioned in this study were also mentioned in other behavioural studies conducted in North America [27, 28].

The participants had limited or no knowledge about PrEP, which offered the opportunity to collect answers free from external influences. On the other hand, responses did not benefit from in-depth thinking. This low awareness of PrEP is consistent with results from other studies conducted in low and middle-income countries [29].

Since PrEP is relatively new and not well known among MSM, it is necessary to raise awareness about it through information campaigns. Many participants seemed to take for granted that PrEP will protect them against all STIs. This erroneous belief could lead to a decrease in condom use once PrEP is available. A few participants admitted that they would stop using a condom or would use it less often if they take PrEP. This raises concerns about risk compensation. PrEP implementation will have to be part of a global prevention program which includes counselling, STI screening, promotion of safe sex practices and consistent condom use. Health care professionals will have to frequently remind PrEP users that this method does not protect against other STIs and that condom use is still important.

Concerning access to PrEP, most participants wish to get their PrEP through an NGO with health care facilities dedicated to them such as RSB. However, some raised the concern that many MSM do not attend these centers because they are afraid to be seen there and to be recognized as MSM by their relatives. Also, some MSM live in remote neighbourhoods and cannot go to centers dedicated to MSM on a regular basis. PrEP availability in every health care center could facilitate access to MSM choosing to hide their sexual orientation.

This study highlighted the fact that MSM experience stigmatization and social exclusion in Côte d'Ivoire. In a cross-sectional study conducted in 145 countries, including African countries, stigmatization was an important barrier to the use of PrEP [30]. However, in this study, most MSM agreed that stigmatization would not stop them from using PrEP. It is important to specify that many participants seemed to take for granted that PrEP will be accessible for the whole population, not only for high-risk groups. Even if reminders were made multiple times concerning the fact that PrEP will probably be accessible for key populations only, this information seemed to be hard to understand for some participants. This could have influenced participants' responses and one can hypothesize that participants might think that the society and their relatives will perceive more negatively PrEP if it was available for key populations only. In this context, PrEP implementation must be done carefully. Broadening PrEP access to all high-risk individuals (and not targeting only MSM) might be a way to mitigate the stigma surrounding PrEP.

The principal strength of this study is the use of the TDF to categorize and understand factors associated with PrEP acceptability within the MSM population of Bouaké. Even if it is difficult to explain how the different domains influence each other, the TDF is appropriate to explore a wide range of barriers and enablers to PrEP use. Unlike other studies that used only quantitative methods to explore PrEP acceptability, this study led to a better understanding of the perceptions of participants by using qualitative methods. These qualitative results will help understand the findings from the quantitative part of the study that is in progress.

The study has a few limitations. Since all the 14 domains of the TDF were not explored, some elements related to PrEP acceptance could have been omitted. However, studies about PrEP acceptability in MSM conducted elsewhere did not highlight themes that were not explored in this study [27 - 30]. Despite efforts to recruit MSM of various age groups, education levels and social classes, the study sample is quite homogeneous. The majority of MSM were young (between 18 and 30 years of age). This can be explained by the fact that older MSM tend to hide their sexual orientation. The study sample was strictly composed of men from Bouaké and the surrounding areas and participating men were in majority related to an association or an organization of MSM. Non-associative MSM's perceptions were not taken into consideration as much as those from associative MSM. Thus, the sample might not be representative of all MSM in Côte d'Ivoire. However, our findings are consistent with other studies on PrEP acceptability among MSM in low and middle-income countries [26, 29]. Another limitation of the study is that participants had limited knowledge about PrEP. To reduce the impact of this limitation on their statements, discussion sessions were held before each focus group and interview to give brief explanations and to answer questions about PrEP. Finally, even if it was mentioned during the discussion sessions, participants' perceptions concerning the regular STI screening for people using PrEP were not explored.

CONCLUSION

PrEP is perceived as highly acceptable within the MSM population in Bouaké, Côte d'Ivoire. Access to all MSM should be promoted by making PrEP available in both public health amenities and NGOs with health care facilities. Health authorities should make sure that implementation is carried out without increasing stigmatization, discrimination or exclusion of MSM. To do so, PrEP should be implemented for all high-risk individuals, without targeting MSM only.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study has been approved by the National Research Ethics Committee of Côte d'Ivoire and by the research ethics committee of CHU de Québec-Université Laval.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

All participants received detailed information on the study. They all gave their written consent after receiving this information and prior to the beginning of the study. Actions were taken to ensure confidentiality and anonymity. At the end of focus groups and interviews, each participant received 2,000

FCFA (approximately, 4$ US) to compensate for the time given to the study.

AVAILABILITY OF DATA AND MATERIAL

The qualitative data (verbatim transcriptions written in French, the language in which the study was conducted) supporting the findings of the article is available in Figshare at https://figshare.com/s/04618c2c5e22975d65ea, reference number 10.6084/m9.figshare.8606669.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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