Designing a mHealth App-Based Intervention to Address the Harm Reduction Needs of Malaysian Men Who Have Sex with Men (MSM) Who Engage in Chemsex: Findings from a Qualitative Study

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Designing a mHealth App-Based Intervention to Address the Harm Reduction Needs of Malaysian Men Who Have Sex with Men (MSM) Who Engage in Chemsex: Findings from a Qualitative Study

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Introduction

Malaysia is a multiethnic, multicultural, and non-secular Islamic country. Men who have sex with men (MSM) in Malaysia face challenges to their health and safety because homosexuality is widely stigmatized and outright prohibited. The legal and social endorsement of discrimination against MSM makes it a hidden and vulnerable population, propagating health disparities. In 2021 the nationwide prevalence of HIV in Malaysia was only 0.3%, while it was 21.6% among MSM (UN AIDS, 2021). Also, in a countrywide online survey, 60.8% of MSM reported major depressive symptoms, and 30.7% had significant suicidal risks - estimates starkly higher than national averages (Ng et al., 2020). While there’s no one cause of these discrepancies, there’s likely a constellation of interrelated determinates, a phenomenon described as syndemics. Syndemics is the synergistic interaction of multiple predispositions, worsening health outcomes. Social, economic, cultural, psychological, and biological factors all intertwine to form health crises that have no clear, singular cause and no direct solution. (Singer, 1994). The complex and self-perpetuating nature of syndemics plunges its victims further into desperation. In Malaysia, the predominance of social stigma, mental illness, substance use, and HIV ensnare MSM in an entangled web of disparities. Chemsex is one emerging manifestation of syndemics in Malaysia.

A Definition of Chemsex and its Debut in Malaysia

Chemsex (aka. “chemfun”, “CF”, or “ice”) is the use of drugs by MSM before or during sex to enhance sexual experiences. Amphetamines (e.g., methamphetamine and mephedrone) are characteristically used because of their specific sensory effects (Asia Catalyst et al., 2021). Amphetamines augment sex by increasing sensitivity, sexual
libido, and energy, postponing ejaculation, and deadening pain (Lim et al., 2018; Mavigila et al., 2023). The stimulatory and disinhibiting effects of amphetamines don’t only magnify sexual gratification but also act as a social lubricant. Prolonged sex, group sex, and sexual fantasizing are associated with chemsex (Lim et al., 2018; Mavigila et al., 2023). MSM have also reported motivations to cope with internalized homophobia, serological status, and other anxieties (Lim et al., 2018; Mavigila et al., 2023). Although some define chemsex exclusively by amphetamine use, other drugs are commonly used. Erectile dysfunction medications, alkyl nitrites (colloquially “poppers”), cocaine, alcohol, cannabis, and ketamine are a few examples (Asia Catalyst et al., 2021). Although chemsex occurs in saunas, clubs, and other venues that MSM frequent, it’s characteristically arranged through geospatial networking applications. Apps like Grinder and Hornet allow MSM to seek out and connect with “chem buddies” through private messaging and location sharing. (Asia Catalyst et al., 2021; Gilbart et al., 2015; Mavigila et al., 2023). GSNs have become chemsex hubs because they allow for discrete and anonymous communication that would otherwise raise public suspicion. MSM even use code words and emojis to signal their interest in chemsex to other online users. For example, the snowflake emoji (❄️) may symbolize methamphetamine, which is commonly referred to as “ice” (Asia Catalyst et al., 2021). The prevalence of chemsex is growing in Asia and Malaysia (APCOM, 2021; Harm Reduction International, 2022). Two estimates place the prevalence of chemsex at just under a quarter of all Malaysian MSM (Kanter et al., 2011; Ng et al., 2020), another at 13% (Lin et al., 2015) and another at 9% (Mavigila et al., 2022).
**Social and Legal Perceptions of Chemsex**

Chemsex amplifies the social and legal risks faced by MSM. In addition to bearing the dual burden of drug and sex-related stigma, they are legally condemned to homosexuality and drug offenses. The consequences of this are harsh: homosexual acts are punishable by fines, caning, and imprisonment (Muhammed & Amuda, 2018). Also, despite the recent abolition of mandatory death penalty sentencing, capital punishment may be discretionally applied for drug trafficking (Amnesty International, 2023). Malaysian penal code describes homosexuality as “against the order of nature,” which is widely socially regarded (Wong, 2021). Former prime minister Mahathir outspokenly admitted that Malaysia “cannot accept” LBGT rights (Ananthalakshmi et al., 2018) and fired deputy prime minister Anwar Ibrahim, accusing him of sodomy (BBC, 2022). There are accounts of violence against Malaysian LGBT, imposed by both the public and the law. Two women were publicly caned in a Sharia courtroom under allegations of having lesbian sex (Lamb, 2018). In another instance, two transgender sex workers were killed by their clients (Ghoshal, 2019). One teenage boy, described as effeminate, was mutilated and beaten to death by classmates (Lang, 2017). Increasingly, litigation and public harassment are being levied against Malaysian LGBT.

Cultural prejudices that are reflected in Malaysian healthcare hamper access and quality of care for MSM. In a study of physician trainees in Kula Lumpur, it was found that medical students who were Muslim and ethnically Malay were less likely to have experience interacting with MSM and more likely to harbor prejudice and discrimination intent. A minority of students who had interpersonal contact with MSM were less prejudiced (Earnshaw et al., 2016). MSM also face stigma directed towards HIV. In a
sample of practicing physicians in Kuala Lumpur, 53% expressed some intention to discriminate against people with HIV. Harboring stigma towards HIV, such as HIV-related shame, or fear of contracting HIV predicted discrimination intent (Tee et al., 2019). Corresponding to physicians’ intent to discriminate, MSM have reported experiencing discrimination from healthcare providers. In a national online survey, 13% of MSM reported experiencing discrimination by a healthcare provider. MSM involved with chemsex were significantly (15.3%) more likely to report experiencing discrimination (Mavigila et al., 2022).

The Associated Harms of Chemsex

Chemsex is associated with riskier sexual and substance use practices, such as group sex, polydrug use, and injection drug use (Bourne et al., 2015; Daskalopoulou et al., 2014; Harm Reduction International, 2021; Mavigila et al., 2022; Nevendorff et al., 2023; Sin et al., 2015). Specifically, condomless sex was described as a norm among Malaysian MSM using amphetamines (Lim et al., 2018). These risky behaviors often result in physical or psychological harm. Multiple studies have demonstrated an association between chemsex and a heightened risk of HIV infection (Nevendorff et al., 2023; Ng et al., 2020; Strong et al., 2022; Sin et al., 2015; Ostrow et al., 2009; Van Tieu et al., 2009) and other STIs, including hepatitis-C (Kohli et al., 2019; Mavigila et al., 2022; Pufall et al., 2018; Sin et al., 2015). MSM who partake in chemsex have greater proportions of depression, anxiety, and somatization than other MSM (Berg et al., 2020; Bohn et al., 2020; 2021; Ng et al., 2020). Amphetamine use is particularly physically and psychologically damaging at acute administration, binge use, and chronic use. Psychiatric effects such as psychosis, anxiety, insomnia, and impaired cognition are
more prevalent in those who abuse methamphetamine chronically (Harro, 2015). There is also a higher risk of cardiac disease, such as chest pain, hypertension, and palpitations. Frequent users are susceptible to heart attacks and at higher risk for coronary artery disease (Dark et al., 2008).

MSM are sometimes directly or indirectly harmed by other MSM during chemsex. These threats range from negligence to outright assault. In qualitative studies, MSM described not receiving the support they needed from more experienced MSM, who were more familiar with drug administration and mitigating drug harms. Also, MSM faced peer pressure to participate in activities like taking unfamiliar drugs (Bourne et al., 2015; Mavigila et al., 2023). Other times MSM were outright assaulted, having drugs forced upon them, or being raped. Sex under the influence of drugs made establishing consent difficult for both partners. (Bourne et al., 2015; Mavigila et al., 2023).

The Potential Role of Mobile Health in Malaysia

The threats of chemsex add a new layer of complexity to the treacherous environment for Malaysian MSM. With no evidence-based intervention for chemsex, MSM are left ill-equipped to respond; harm reduction techniques remain the only defense. Yet, there is no public health messaging because safe-sex interventions are inextricably tied to promiscuity and irreverence. Mobile health could serve as the health advocate that Malaysian MSM are lacking. Mobile health (mHealth) is the delivery of healthcare through personal digital devices. It is especially well positioned to serve MSM because it circumvents contextual challenges in Malaysia that impede public health interventions. mHealth can be accessed discretely and anonymously, eliminating the chance of homophobic encounters. mHealth is also optimized by MSM’s unique
aptitude for smartphones, as demonstrated by the integral role of mobile technology in
chemsex. mHealth is widely accessible and accepted in Malaysia. As of 2020, 99.2% of
MSM own smartphones, and 63% have used them to seek sexual health information
(Shrestha et al., 2020). MSM involved with chemsex are more likely to seek sexual
health information through smartphones (Shrestha et al., 2020). A mobile health
intervention could fulfill the health needs of MSM. Here, we interviewed Malaysian MSM
to guide the development of an accessible, acceptable, and effective chemsex mHealth
intervention.

Methods

Participants and Recruitment

Six virtual focus group discussions were conducted with twenty-two Malaysian
MSM between February and August 2022. Each lasted approximately ninety minutes.
Eligibility criteria were 1) being eighteen years or older, 2) self-identifying as MSM, 3)
having participated in chemsex in the past six months, and 4) being fluent in English or
Basha Malaysia.

Participants were recruited through Facebook and the geospatial networking
application Hornet. Advertisements were sent to all Malaysian Hornet users via in-app
instant messaging. Targeted banner advertisements were displayed on Facebook.
Interested participants clicked on the advertisement link which allowed them to provide
their contact information. Study coordinators followed up with interested persons to
determine eligibility, provide further study information, and obtain consent.

Procedures
Before the focus group discussion, participants completed an online (Qualtrics) survey on demographics and chemsex history. They were probed on their smartphone use, health status, chemsex practices, and frequency of chemsex activities. Focus group discussions were conducted in a virtual conference call where a trained facilitator led the discussion of 3-5 participants. Participants were informed that participation was voluntary — in part or whole. They verbally consented. To maintain anonymity, the participants were asked not to share any sensitive personal information or surnames. They were encouraged to use pseudonyms and not to use their webcams if they preferred.

The facilitator used a semi-structured interview guide to direct the conversation while a cofacilitator took notes and monitored the chat board. The topics discussed included barriers to healthcare (e.g., cost, stigma, quality of care, legal consequences), unmet needs (e.g., information and education, peer support, healthcare), app features (e.g., drug tracking, emergency assistance, group forum), and app attributes (e.g., anonymity, data privacy, usability). The recording was transcribed and translated into English as needed by the researchers. Participants were compensated 40 Malaysian ringgits — approximately 10 U.S. dollars for completing the study.

Data Analysis

Four researchers open-coded the first three focus group transcripts. Each researcher independently reviewed each transcript, identified motifs in the conversations, and labeled them with a code. The researchers then meet to confer the codes and establish a consensus. Related codes were categorized into overarching themes (e.g., barriers to healthcare), constituting the initial codebook. After reviewing
each subsequent transcript, the codebook was refined; emerging themes were identified, and existing ones were modified in light of the new data. The codebook was then entered into Dedoose (Version 9.0.54) and all six transcripts were reanalyzed according to the aforementioned process, further refining the codebook. Summary statistics on variables collected from the Qualtrics survey were calculated using SPSS (Version 28.0.1.1).

Results

Participant Demographics

Most participants were ethnically Malay (72.7%), single (86.4%), and identified as gay (90.9%). Half (50%) were living with HIV. The mean age was 30.6 (SD=5.3).

The Existing Barriers to Health, Safety, and Harm-Reduction Techniques

Reliable and consistent information pertaining to chemsex was reported as highly valuable and scarce. For instance, MSM desire information pertaining to the safe dosing and administration of drugs, counteracting overdoses and chronic side effects, and information relevant to maintaining their overall health and well-being. Currently, sources that MSM frequently consult for information include internet forums or blogs (e.g., Reddit), other MSM, and non-governmental organizations, although this last form was not as frequently mentioned. Problematically, the participants reported that online information was often inconsistent, easily misinterpreted, or outright wrong:

People don't know where to find information. If they are googling, there is a lot of information that might be correct or might not be correct, or they might have to interpret it by themselves.
Other, trusted MSM were the most reliable source of knowledge. Correspondingly, MSM with little experience were predisposed to having negative encounters:

*Sometimes when they’re having sex with someone, they have no experience with chemsex. They might not know what to do if someone overdoses. I'm very lucky because I met someone who has a lot of experience. He is like a walking CF library.*

Beyond sharing information, MSM described peer support as important in the practical and social aspects of chemsex. Sharing emotional support, communicating candidly, and being vigilant for overdoses were protective and enhanced the participant’s experiences:

*My first experience, I panicked. I had so much energy but at the same time, I panicked. I chatted with a few of my friends. I said I was taking ice. I told them “I’m panicking”. They said, “Relax, don’t do anything”.*

In contrast to peer support, sometimes MSM were harmed by one another. For instance, the existence of stigma towards HIV in the community. Or where MSM were negligent of the welfare of others:

*The thing about my first experience, (it) was not so good because the guy didn’t really take care of me.*

Beyond negligence, some MSM described experiences of peer pressure, forced drug use, or sexual assault:

*It wasn’t exactly spoken about prior to our meeting, and I didn’t expect there to be any sort of drug usage. I guess it was out of peer pressure.*

The potential for legal repercussions was a prominent prohibitor of healthcare access, especially regarding emergency care access in case of an overdose. MSM were
hesitant to request emergency services for fear of disclosure to the police and government. The participants implied that their association with drugs or homosexuality could lead to their arrest:

*It can be quite scary calling the emergency, allowing them to know that you’re associated with drugs. Nobody would want to do that.*

Hesitancy to access emergency services left MSM vulnerable to overdoses. Some MSM described having near-death experiences. Meanwhile, their peers weren’t educated on how to respond to these emergencies:

*I was overdosing and I didn’t know what to do. I think I was not conscious for one hour, but my eyes were still open.*

When MSM did access healthcare, they were weary of doctors and perceived them as technically and empathetically incompetent. Especially regarding chemsex related health concerns. They saw doctors as hierarchically distant from them and naïve:

*They learn from the textbooks, from their peers, from their mothers that drugs are bad and to stay away from them.*

Even when MSM choose to consult doctors, they didn’t perceive doctors’ advice as useful, citing their lack of education and experience with chemsex:

*They are not drug takers, so they don’t understand what the drugs are or what will happen. They don’t have the experience.*

Generally, the participants conveyed that the government and Malaysian healthcare as an institution was unreliable and untrustworthy for their healthcare needs, driving them to seek advice from other sources.

*The Role and Features of a Chemsex App*
Detailed and unbiased technical information on chemsex is needed. Specifically, education on chemsex drugs (e.g., drug identification, physical and psychological effects, dosing, safe administration, signs of overdose, interactions, etc.), harm reduction techniques (e.g., nutrition & hydration, PrEP, STI prevention, etc.), and other topics is needed to keep MSM safe and health, especially novices. A virtual resource center could serve as the comprehensive and definitive guide on chemsex:

*It will be great to have everything in one place. The chemical compound, the bad experiences, good experiences, safe experiences, and unsafe experiences are all contained in the drug. It depends on use. There's no right or wrong way. Whatever you do, it's up to you.*

Community support is a key asset to Malaysian MSM as it provides knowledge sharing and emotional support, which are scarce. MSM conveyed that they exist in a network of social ties, which nourishes them, and they contribute to it. They desire relatedness with their peers and to confide in them. A chemsex app could facilitate this peer support through a peer support group feature, where MSM interact virtually:

*When you asked us a question and then we answered in length, that is because we want to share what has happened to us. We need a support group like this.*

The harm reduction kit order is a feature that allows MSM to acquire the necessary materials to keep safe during chemsex. This care package could contain condoms, lubricants, PrEP, syringes, and educational materials for use with chemsex. It appeals to MSM because of its discreetness and convivence:

*It should be a starter pack, like a toiletries pack that you carry around for traveling. You could also incorporate a short lesson on proper usage, on how to use it correctly.*
MSM emphasized the importance of having on-demand access to an expert community member in case they need immediate medical or legal advice. For instance, in an overdose or mental health crisis:

*Maybe you want someone to talk to not get paranoid or, you know, like hallucinate.*

Since MSM are reluctant to access emergency services in the case of an overdose, emergency assistance could help MSM identify and care for an overdose victim under expert guidance, without disclosure to the police:

*When it comes to this emergency contact, it would be best to have community members that gives support, someone that is experienced and will not declare this situation to the government.*

MSM suggested that drug tracking could help them monitor and regulate their long-term consumption patterns. Drug tracking allows MSM to identify changes in habitual behaviors that are often attributable to mood or life circumstances. One participant described his increased use over pandemic travel restrictions:

*During MCO (Movement Control Order), I took (drugs) almost every two weeks, not because I'm depressed, but I cannot go out. I have nothing to do at home. After that, no more MCO, I can go out with my friends, so back to my usual once-a-month routine. So maybe the app can track why suddenly my use is so frequent.*

Linking MSM to service site locations is the intuitive next step after educating MSM through the application. The application could refer MSM to healthcare resources for HIV/STI testing, PrEP, mental health counseling, and other health services important for MSM involved with chemsex:
I can get PrEP easily, but if I go outside my town, I can’t find clinics that offer PrEP. So,

it’s very important.

Attributes That Will Make the Chemsex App Acceptable for MSM

In all the operations of the application, it should preserve the anonymity of its users. It should collect only limited and necessary user data. MSM are concerned with the ownership and management of their data:

I mean it is a sensitive topic, I can get arrested for it. Yes, right. And it's Malaysia, you never know what's going to happen, who's going to freak out, who's going to get freaky with all these things, all this information. I don't think it's necessary to share a user's location.

The application should have an easy-to-use and pleasant interface. One suggested that it should strive towards the aesthetics and playfulness of social media apps.

It should be in simple layman’s terms, not technical.

User interface is important. It should almost be as simple as using Grindr. It should be as simple and relatable as possible.

Discussion

Chemsex introduces new complexities to the paradigm of homosexuality in Malaysia. The synergetic combination of its discrete risks makes it perhaps the greatest threat to MSM yet. In Malaysia, MSM are already disadvantaged and ill-equipped to respond to the harms of chemsex. By illuminating the specific impediments to health, safety, and wellbeing, an intervention could be designed to meet the unfulfilled needs of MSM involved with chemsex. A mobile health intervention (mHealth) is especially well-suited for this context because it can be widely disseminated and accessed discretely.
The most cited need of MSM was high-quality, consistent, impartial, and complete information related to chemsex. Currently, the existing sources of information do not provide the reliable and comprehensive information that MSM need to practice chemsex safely. A chemsex app is optimally positioned to address this need through a resource center, which would contain a curated library of information on chemsex drugs including their names, identifiers, short-term effects, administration methods, contraindications, dosing schemes, interactions, and other crucial information. The availability of this information could greatly improve drug safety. Moreover, educational materials on harm reduction could help guide MSM to reduce the ill effects of chemsex. For instance, hydration, taking breaks, logging drug use, amongst others.

Once MSM have learned about harm reduction techniques and how to implement them, they must acquire those materials. Obtaining safe sex materials in Malaysia may be challenging as it bears a negative social connotation. By allowing application users to order those supplies they could be shipped directly to the user or to a drop-box pick-up location.

Another important aspect of chemsex in Malaysia is social support. MSM don’t just practically support one another through knowledge sharing but confide in one another. This is important as many MSM do not disclosed their sexual orientation to their families, friends, or coworkers and may feel socially isolated. A chemsex application could organize peer support groups by connecting MSM through online messaging, forums, or video chats.

In Malaysia, MSM are impeded from accessing healthcare by both legal and social rules. Both homosexuality and recreational drug use are punishable crimes. Also,
due to widespread stigma directed towards MSM, HIV, and drug use, physicians may discriminate against these groups. A chemsex application could provide on-demand access to an empathetic community member and expert. This expert could provide emergency advice, for example, in the case of an overdose. Or, this expert could provide emotional support, mental health counseling, along with medical and legal advice.

Regarding all the functionalities of the app, MSM are most concerned with anonymity and data ownership. MSM are reluctant to provide even basic information and do not wish to share their location. The application must be designed accordingly to be accepted by MSM.

**Conclusion**

Malaysian MSM are especially disadvantaged due to the syndemic interactions of societal stigma, persecution, mental illness, drug use, and HIV. Chemsex amplifies every one of the risk factors, making MSM who partake in chemsex a most hidden and vulnerable population. A mobile health intervention could optimally serve MSM because of its unique strengths (e.g., anonymity and accessibility). MSM most desired a resource center where they could access high-quality and consistent information on chemsex drugs, dosing, interactions, and hazards, and harm reduction techniques to reduce those hazards. The resource center could also provide education on HIV testing and prevention and other relevant information. Next, they most strongly desired a medium to connect with and help their peers through information sharing and emotional support. To acquire the harm reduction materials, they requested an order function to deliver condoms, PrEP, syringes, and other supplies directly to their doorsteps. Real-time
consultation could serve MSM when emergencies arise, or when they need candid advice from a non-judgmental peer. Overall, MSM desire an application that respects their privacy and confidentiality, and one that is easy to use and understand.
References

Chemsex in Asia: A Community Manual on Sexualized Substance Use among MSM. (2021). Retrieved from

A qualitative scoping review of sexualised drug use (including Chemsex). (2021). Retrieved from


<table>
<thead>
<tr>
<th>Child Code</th>
<th>Description</th>
<th>Number of Mentions (N)</th>
<th>Selected Excerpts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>The knowledge that MSM need but are lacking</td>
<td>87</td>
<td>“In an ideal world, we could find the information that we need freely available, anywhere and by anyone. But the reality is we’re in Malaysia”.</td>
</tr>
<tr>
<td>Peer Negligence</td>
<td>A lack of communication, mutual trust, reciprocity, or concern for other MSM</td>
<td>20</td>
<td>“Two men should be able to discuss their status without the fear of being shown the door. Or get any information from your sexual partner without any fear.” “My first experience was not so good, because the guy didn’t really take care of me.”</td>
</tr>
<tr>
<td>Peer Hostility</td>
<td>Aggression or peer pressure imposed by MSM</td>
<td>20</td>
<td>“It wasn’t exactly spoken about prior to our meet, I didn’t expect for there to be any sort of drug usage. And I guess it was out of peer pressure.” “If the person is not too close to you then they may trick you.”</td>
</tr>
<tr>
<td>Clinical Services</td>
<td>Preventative, therapeutic, and chemsex-related care that MSM need but are lacking</td>
<td>23</td>
<td>“I want treatment without going to rehab and without affecting my daily routine.”</td>
</tr>
<tr>
<td>Legal Consequences</td>
<td>Legal repercussions impeding healthcare access</td>
<td>17</td>
<td>“It’s a sensitive topic, I can get arrested for it. And it’s Malaysia, you never know what’s going to happen.”</td>
</tr>
<tr>
<td>Stigmatization by Medical Providers</td>
<td>Stigmatization of MSM by medical providers as an impediment to healthcare access</td>
<td>18</td>
<td>“I can’t freely speak about my drug usage with my GP or other doctors because there would be a level of judgments that is passed on.”</td>
</tr>
</tbody>
</table>
Perceived Incompetence of Medical Providers

A perceived lack of technical and empathetic understanding of medical providers impeding healthcare access, especially related to chemsex and HIV related needs

17

“They are not drug takers, so they don’t understand what the drugs are or what will happen. They don’t have the experience.”

“I take HAART. When I talk to a doctor, they don’t understand the side effects…I CF but doctors don’t understand…. We need people who are in the community…Majority don’t want to see psychiatrists or doctor.”

Cost

Cost of access to sexual harm reduction services (e.g., PrEP, STI testing)

4

“When I think about how I need to pay, I know it would be better if I didn’t go for a consultation.”

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<th>Description</th>
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<th>Selected Excerpts</th>
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</thead>
<tbody>
<tr>
<td>Resource Center</td>
<td>A source of thorough and reliable information on safe chemsex use and harm reduction techniques (e.g., dosing, drug interactions)</td>
<td>110</td>
<td>“From my own research, I do know that it’s important not to share syringes, for instance, or to be aware of any air bubbles, or the way it’s administered…I find that information is often not available locally, you have to venture out.”</td>
</tr>
<tr>
<td>Peer Support Group</td>
<td>A feature for information sharing and support amongst peers</td>
<td>57</td>
<td>“People with the same interests as you, they can understand and connect with you on the same level. Especially if the guy is also (HIV) positive.”</td>
</tr>
<tr>
<td>Harm Reduction Kit Order</td>
<td>The provision of harm reduction supplies (e.g., condoms and lube) via delivery or local pick-up</td>
<td>57</td>
<td>“It should be a starter pack like a toiletries pack that you carry around for traveling.”</td>
</tr>
<tr>
<td>Ask the Expert</td>
<td>Real-time consultation with a knowledgeable person for medical advice</td>
<td>37</td>
<td>“I was struggling alone, and I couldn’t sleep, I needed a companion who knows better and could calm me down.”</td>
</tr>
</tbody>
</table>
Emergency Assistance

Resources available in the case of an overdose or other emergency

37

“It would be best to have a community member. If you call the ambulance, it’s associated with a public clinic or hospital which is also associated with the government.”

Drug Log

A feature to log drug use to track habitual behaviors

32

“Once a month is my limit, so maybe the app is good to track so that it can notify me if my use becomes suddenly more frequent.”

Service Site Locations

A list of service sites to receive care or treatment (HIV testing sites, PrEP providers, mental health counseling)

6

“I can get PrEP easily, but if I go outside my town, I can’t find clinics that offer PrEP. So, it’s very important.”

Reminders

Notifications to remind MSM to take harm reduction measures

1

Table 3: Attributes that will make the app accessible and acceptable to MSM

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<thead>
<tr>
<th>Child Code</th>
<th>Description</th>
<th>Number of Mentions (N)</th>
<th>Selected Excerpts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privacy and Confidentiality</td>
<td>Preserving the identities and information of the users</td>
<td>38</td>
<td>“A place you can turn that’s trusted and anonymous and private, that’s appealing.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“I don’t think it’s necessary for you to share a user’s location.”</td>
</tr>
<tr>
<td>User Interface</td>
<td>Ease of use of the app, technical and conceptual simplicity, languages preferences, and profile customization</td>
<td>3</td>
<td>“It should be in simple laymen’s terms, not technical. User interface is important. It should almost be as simple as using Grindr. It should be as simple and relatable as possible.”</td>
</tr>
</tbody>
</table>