



Understanding the contexts and dynamics of poppers use among gender and sexually diverse people (GSDP) in Dhaka, Bangladesh

Pritom Kumar Das, Samira Dishti Irfan, Jahidul Islam Imran, Sharful Islam Khan^{*} 

Program for HIV and AIDS, Health Systems and Population Studies Division, International Centre for Diarrhoeal Diseases Research, Bangladesh

ARTICLE INFO

Keywords:

Poppers
Alkyl nitrites
GSDP
Bangladesh

ABSTRACT

Introduction: Growing evidence indicates emerging use of alkyl nitrites (poppers) to augment sexual performance, especially among gender and sexually diverse people (GSDP). However, evidence remains limited where dual stigma and criminalisation of drug use and homosexuality impede harm reduction. This article explored how GSDP in urban Bangladesh understood and experienced poppers use within social, sexual and emotional lives.

Methods: This qualitative study entailed 17 in-depth interviews with GSDP in urban Dhaka, Bangladesh, recruited through snowball sampling. Reflexive thematic analysis was applied in relation to the infrastructures of intimacy framework.

Results: Findings revealed three interconnected themes: (i) Attaching meaning to poppers use: Participants cited poppers use for managing penetration anxiety, achieving social distinction, facilitating sexual fantasy, and as a perceived harm reduction alternative to methamphetamine; (ii) Techniques of regulation and labour of pleasure: participants acquired knowledge about and regulated poppers use through online and offline networks, circulating informal harm reduction practices that addressed tangible harms while under-recognising certain risks; and (iii) Relational and networked ecologies of care: access and information were molded by trust, social capital and discretion within digital spaces while introducing new forms of vulnerability.

Conclusion: Poppers use among GSDP in Bangladesh emerged within fragile yet adaptive infrastructures of intimacy, sustained in the absence of formal healthcare systems through peer-driven networks of care, information and trust. Health strategies must build on these systems, and approach harm reduction as a social negotiation of safety, belonging and pleasure rather than behaviour change.

Introduction

Poppers are a nitrite inhalant (e.g., alkyl, butyl, isobutyl, and isopropyl nitrites) commonly used in recreational and sexual contexts. Pharmacologically, poppers act as potent vasodilators that relax smooth muscle tissue and produce a brief sensation of warmth, light-headedness, and muscle relaxation (Pepper, 2021). Among men who have sex with men (MSM) and other gender and sexually diverse people (GSDP), poppers are often used during sexual encounters to enhance sensory experience and facilitate receptive anal intercourse by reducing muscular tension (Pepper, 2021; Schwartz et al., 2020).

Evidence in Asia indicates widespread poppers use, though estimates vary by setting and measurement period (Wang et al., 2023; Zhao et al., 2017). Studies among MSM in China and Japan reported lifetime prevalence estimates of 47% and 63%, respectively (Hidaka et al., 2006;

Li et al., 2014). In several East Asian countries, poppers use has been reported to be more prevalent than methamphetamine or ecstasy (Chin, 2020; Samuel, 2021; Tan et al., 2021). Despite a growing evidence base in Asia, data remain scant in South Asia, including Bangladesh. Yet, a case report of “Poppers Maculopathy” on a transgender person in Pakistan exemplifies poppers use, even if not captured through national surveys (Shahid et al., 2022).

The evidence gap on poppers is likely influenced by both structural and academic factors. At the structural level, pervasive stigma and restrictive legal environments surrounding homosexuality and drug use have not created a conducive research climate. This predisposed GSDP communities to concealment, thus limiting scope for data collection (Banik et al., 2023; Irfan et al., 2023; Mimiaga et al., 2024). On the other hand, academic discourse presents two persistent dynamics that may have worsened their marginalisation. Firstly, systematic reviews suggest

^{*} Corresponding author at: Program for HIV and AIDS, Health Systems and Population Studies Division, International Centre for Diarrhoeal Diseases Research, 68 Shaheed Tajuddin Ahmed Sarani, Mohakhali, Dhaka 1212, Bangladesh.

E-mail address: sharful@icddr.org (S.I. Khan).

that the observed association between poppers use and HIV or STI infection is complex and likely mediated by associated sexual behaviours. As most available studies are observational, the existing evidence does not allow definitive causal conclusions regarding poppers use and HIV transmission (Abdalla et al., 2024). Secondly, comparative harm-ranking exercises that adopted the Multi-Criteria Decision Analysis (MCDA) have identified poppers as one of the least harmful psychoactive substances, compared to alcohol, cannabis or nicotine (Ferreira et al., 2022). These dynamics may partially explain why poppers remains underexamined in many public health contexts. Because poppers are often perceived as less harmful than other psychoactive substances and are frequently discussed within the broader category of sexualised drug use, they may receive less attention in both epidemiological research and clinical guidance. As a result, poppers use often remains embedded within broader chemsex discussions rather than being examined as a distinct practice. Consequently, poppers have often remained under-prioritised in research and clinical discussions, particularly in regions where sexual minority health research is already limited.

This does not imply the absence of harm. Although poppers are generally considered less harmful than many other substances, their use can result in rare but serious adverse outcomes, including life-threatening methaemoglobinaemia following accidental ingestion and ocular damage such as poppers-associated maculopathy (Barrangou-Pouey-Darlas et al., 2021; Myung & Kasper, 2024; Pepper, 2021). As vasodilators, poppers could also cause severe hypotension, particularly when combined with erectile-dysfunction medications (Pepper, 2021; Schwartz & Kloner, 2010). These health concerns are coupled with structural risks. Since commercial products are labelled evasively and remain unregulated, people who use poppers remain vulnerable to misinformation and contamination (Measham et al., 2025; Myung & Kasper, 2024). While the South Asian region lacks systematic data, evidence in other Asian contexts with documented poppers use suggests the potential for similar adverse health events in comparable sexualised drug-use settings (Bae et al., 2018; Nevendorff et al., 2025). Beyond these harms, poppers use is linked to risky sexual behaviours and concurrent drug use (Abdalla et al., 2024). Together, these risks underscore the value of qualitative inquiry for understanding how GSDP perceive harm, interpret symptoms, and navigate misinformation and healthcare-seeking pathways.

Despite growing global health concerns, existing poppers research remains largely limited to documenting prevalence and risk correlates. Far less is known about users' motivations, perceived risks, health implications, and safety practices. Prior studies have primarily focused on HIV/STI transmission risk, sidelining the lived experiences, motivations, and perceived benefits of poppers use (Schwartz et al., 2020). This imbalance reflects a broader tendency to approach poppers through heteronormative and pathologizing lenses that frame gay sexual practices as inherently risky (Schwartz et al., 2022). As a result, poppers use has been embedded within a predominantly biomedical framework, with limited attention to socio-cultural contexts. Together, these gaps underscore the need for qualitative research that centres user perspectives, particularly in underrepresented regions.

The structurally challenging context of Bangladesh further pronounces this need. This would not only provide a non-Westernised perspective, but also generate insights on how poppers use operates amidst the criminalisation of homosexuality and drug use. Under Section 377 of the Penal Code, same-sex activities are criminalised, with severe legal consequences, thus reinforcing legal risk and stigma for GSDP (Alam & Marston, 2023; Irfan et al., 2023). To our knowledge, there are currently no specific regulations governing poppers. This regulatory vacuum contributes to the absence of targeted harm reduction initiatives and a lack of clinical guidance for providers.

Poppers use is closely linked to digital platforms, especially in restrictive contexts like Bangladesh, where criminalisation and stigma often push GSDP activities into online spaces. Research has documented

a strong association between geosocial networking (GSN) applications (e.g. Grindr) and poppers use (Boonchutima & Kongchan, 2017; Zhang et al., 2016). These platforms facilitate partner-seeking but also act as marketplaces for advertising poppers through emojis, links and coded language (Nevendorff et al., 2025). At the same time, online networks help shape and sustain community norms by circulating experiential knowledge, including safety tips, harm reduction advice and, sometimes, misinformation (Marques Oliveira et al., 2023; Nevendorff et al., 2025; Pepper, 2021). Understanding how these digital environments structure knowledge and distinguish accurate exchange and influence perceptions of safety and risk is crucial for designing congruent harm reduction interventions in Bangladesh.

To analytically examine how poppers use operates within these structural and relational conditions, we draw on the infrastructures of intimacy framework, built on Berlant's theorisation of affective infrastructures (Berlant, 1998) and further elaborated by Wilson (2016), with full conceptual development provided in the Methods section.

Guided by the research questions examining how individuals initiate poppers use, how they learn to use it safely and how community networks support these practices, this study aims to explore how GSDP in urban Bangladesh understand and experience the use of poppers within their socio-sexual lives amidst structural challenges. In line with the research questions, this aim has been operationalised through the following objectives:

- To explore how individuals experience and interpret the bodily and emotional effects of poppers use
- To examine how knowledge about poppers use, including knowledge about safety and risk regulation, is learned and shared in everyday contexts, in the absence of formal harm reduction
- To understand the role of community and digital networks in shaping access to poppers, circulation of information and safety perceptions

Methods

Study design

This article was nested within an ongoing sexual and reproductive health and rights (SRHR) surveillance initiative among various key populations in Dhaka, Bangladesh, including gender and sexually diverse people. The SRHR surveillance, adopting a repeated cross-sectional survey design, convened over two rounds, aimed to explore SRHR indicators among these populations, including drug and hormone use, family planning, contraceptive use, sexual rights, etc. (icddr b, 2024). The surveillance system integrates quantitative monitoring with an embedded qualitative component that investigates emerging issues requiring in-depth exploration. Among these, sexualised use of drugs was identified as an emerging concern, necessitating deeper inquiry through qualitative interviews. Recent surveillance observations suggested early signals of sexualised drug use within certain urban socio-sexual networks. In particular, our initial qualitative data illuminated the use of poppers, especially among these higher socioeconomic networks due to the high cost of poppers. However, since poppers use was not previously documented in the Bangladeshi context, we expanded the qualitative component of the surveillance system to explore this phenomenon in greater depth and to understand the meanings, practices and perceived risks surrounding poppers use among sexual and gender diverse people (GSDP).

Theoretical framework: infrastructures of intimacy framework

In line with the research questions and objectives, we aimed to explore the meanings, community practices and perceptions of safety and risk regarding poppers use among GSDP in urban Dhaka, Bangladesh. Guided by constructivist epistemology, which views knowledge as a product of human and social constructions, we have

framed our analysis in relation to the infrastructures of intimacy framework, conceptualised by Berlant (1998, 2016) and subsequently elaborated by Wilson (2016). This concept builds on Berlant's discourse on intimate publics and affective infrastructures, which explores how material and social conditions sustain everyday relations of pleasure, care and belonging (Berlant, 1998). This framework was subsequently informed by Wilson, who adopted the term "infrastructures of intimacy" to describe the social, material and cultural arrangements enabling intimate and sexual lives (Wilson, 2016). This type of analysis is crucial for contexts shaped by regulation, inequalities and stigma. This framework also enables us to theorise how sexual and drug-related practices are driven by broader material, social and affective conditions rather than individual choices. In contexts where drug use and homosexuality are criminalised, communities are often forced to navigate intimacy through discreet and informal networks (Guadamuz & Boonmongkon, 2018; Nevendorff et al., 2025). Thus, this framework illuminates how GSDP create and depend on alternative infrastructures, including digital networks, community-grounded trust and indigenous exchanges of information. Such analysis could provide crucial insights for informing contextually sensitive harm reduction interventions that also address the nuanced complexities and relational dynamics of the communities.

Study populations and sites

The study populations include GSDP, i.e., self-identified gay men and transgender women residing in urban Dhaka. Recruitment occurred primarily within relatively affluent and socially connected urban networks. This was not an intentional sampling decision but reflected how poppers use is distributed in the study context, where its high cost and limited availability concentrate access within such networks. Initial participants were identified within these circles, and subsequent snowball sampling reproduced these network boundaries, as is typical in research with hidden populations. Accordingly, the sample reflects a specific segment of GSDP rather than the broader MSM population, which should be considered when interpreting the transferability of findings, particularly with respect to less networked or lower socio-economic MSM and hijra (a group of transgender women who are born at male or intersex but embody feminine characteristics and identify as part of the hijra sub-culture (Irfan et al., 2026; Khan et al., 2009)) communities.

To be eligible to participate, the GSDP needed to be at least 18 years old, based in Dhaka and part of the urban self-identified gay men or educated transgender women's communities, who reported current or past use of poppers within the past year. Exclusion criteria included those who were physically or mentally incapacitated to respond to interview questions. Participants frequently described poppers as an expensive and difficult-to-access substance that circulated through socially connected peer networks. Importantly, this characterisation reflects qualitative insights from participant narratives and recruitment patterns rather than population-level estimates from surveillance data.

As male-to-male sex is criminalised under Section 377 of the Penal Code, participants (N=17) remained within covert, hard-to-reach networks. Therefore, one of our research team members (and co-author), a self-identified gay man, facilitated the recruitment of participants through snowball sampling. Initial recruitment was performed via encrypted online platforms, such as Facebook, Grindr and Telegram. Grindr and Blue2 are location-based social networking applications widely used by GSDP, while Telegram is an encrypted messaging platform that allows users to communicate through pseudonymous accounts and private groups. These platforms enabled participants to interact and exchange information within relatively anonymous digital spaces. Participants came from diverse backgrounds, including students, office professionals and service workers. Recruitment continued until thematic sufficiency was achieved, resulting in a final sample of 17 participants.

Data collection

Data were collected from 17 open-ended in-depth interviews, lasting approximately 60-90 minutes each. Interviews were conducted by one of the two authors (one of whom is from the self-identified gay community and one is a psychologist) in private, safe spaces such as a closed room in the authors' office or participants' residence, which the community-based author had access to. If the participant did not wish to be interviewed in-person but consented to being a part of this study, encrypted video conversations over WhatsApp were conducted. Interviews were conducted in standard Bengali.

The interview guidelines explored several domains, including: 1. motivations and pathways into poppers use; 2. bodily experiences, perceived risks and adverse reactions; 3. relational and sexual contexts of poppers use; 4. community and digital networks for exchange of information; and 5. reflections on moral and health-related aspects. Consistent with the infrastructures of intimacy framework, interview questions also explored the infrastructures through which poppers use was coordinated, including access pathways, digital platforms, peer learning and trust networks within sexual communities. The interview guideline was flexible as it was iteratively modified based on emerging field issues. These issues were discussed in regular debrief meetings, while updating the interview guideline where necessary.

We received written consent from all participants, where they were assured about maintaining strict confidentiality, and their rights to withdraw from the interview at any time, or decline any questions. All interviews were audio-recorded, and transcribed verbatim on the same day. Data were kept on a password-protected computer which could only be accessed by the authors. The Research Review and Ethical Review Committees of the Institutional Review Board of icddr,b (PR-22033) approved the study protocol.

Data analysis within the theoretical underpinning

We applied the infrastructures of intimacy framework to inform the development of the interview guide and the analytic process. Drawing on Berlant's theorisation of intimacy as publicly mediated and Wilson's elaboration of intimacy as coordinated through material and relational infrastructures, we approached poppers use not as an isolated behaviour but as embedded within systems of access, trust, digital circulation and embodied practice (Berlant, 1998; Paasonen, 2017; Wilson, 2016). The framework therefore functioned as a set of sensitizing concepts that guided attention to relational networks, digital platforms, knowledge circulation and embodied techniques shaping poppers use (Blumer, 2017). Analytically, we adopted reflexive thematic analysis informed by constructivist epistemology (Braun & Clarke, 2019). Coding was primarily inductive in generating themes from participants' narratives, while the infrastructures of intimacy framework functioned as sensitizing concepts during interpretation (Saldaña, 2021). The codes were consolidated into key themes, after iterative comparison and refinement. We used NVivo software for data management and coding. We maintained reflexive memos throughout the data analysis process to document analytical decisions and researcher positionality. If any disputes arose, they were resolved by consulting with the senior author. Throughout the analytical process, the research team reflected on their positionalities, including differences in disciplinary background and proximity to the community, and considered how these perspectives might shape interpretation of participants' narratives.

To enhance qualitative rigor and trustworthiness, we employed several strategies. We regularly convened peer debriefing sessions, including with our community-based author, to integrate intersecting insider (emic) and outsider (etic) perspectives. Our community author contributed critical insights regarding the cultural and linguistic nuances of the data, thus enriching interpretive depth and authenticity. Yet, to mitigate issues arising from over-familiarity, analytical discussions also included a complementary blend of non-peer researchers who

were less embedded in GSDP networks. Moreover, in these sessions, analytical decisions were periodically reviewed by two senior qualitative researchers (including the senior author, a medical anthropologist). Where feasible, brief follow-up communication with participants was used to confirm contextual accuracy of selected interpretations and ensure that the thematic descriptions reflected participants' experiences appropriately.

Participants ranged in age from 19 to 37 years (mean age approximately 28 years). Most participants identified as gay men ($n = 15$), while two participants identified as transgender women. Each participant was assigned an anonymised sequential identifier (P1–P17) in the order interviews were conducted, used consistently alongside age, gender identity and sexual role in the Results section (Table 1).

Results

Theme 1: attaching meaning to poppers use

Among participants in Dhaka, poppers use was primarily described in relation to embodied sexual experience. Rather than framing it as a recreational drug in isolation, participants articulated its value in terms of bodily relaxation, anxiety reduction and the ability to engage in desired sexual practices. For many, the meaning of poppers emerged through contrast: between pain and pleasure; tension and release; and fear and anticipation.

"I feel light-hearted": Managing penetration anxiety and bodily tension

Several participants described their first encounters with penetrative sex as physically painful and emotionally distressing. Narratives included experiences of tension, anticipatory fear and difficulty relaxing during receptive sex. One participant described how poppers produced a distinctive bodily shift during sex: "I feel light-hearted, a release in the lower body, also enjoyment." (P8, 28, gay man, bottom)

Participants ascribed clearer meanings to poppers use when comparing it to past sexual experiences. Several participants reported feeling anxious about penetration (bottoming). As one participant described his first sexual experience, "I feel like my legs don't work. The moment my boyfriend goes on top, I feel extreme pain. I jump and tell him, 'not today'." (P11, 31, transgender woman, bottom)

Some participants reported that before using poppers, they avoided penetrative sex. One participant described his dilemma between intimacy and fear of penetration, "I enjoy foreplay, like oral sex and other things, but I freak out during actual penetration. What if I face a bad situation like last time? (...) While I wanted to have sex, at the same time, I didn't." (P8, 28, gay man, bottom)

For some participants, earlier sexual experiences involved coercion, unequal power dynamics or physical pain. These histories contributed to ongoing anxiety about penetration. As one participant narrated an early sexual encounter that occurred when he was still a minor:

"Due to my feminine behaviours, my landlord's son targeted me. He seemed like a sweet boy as he gave me attention whilst others bullied me. But when he had sex with me, I was only eleven years old. And I bled. I could not sit for the first few days or use the toilet. I cried. When my parents asked, I told them I was hurt at school, but could not tell them the truth." (P8, 28, gay man, bottom)

These adverse childhood experiences contributed to penetration anxiety continuing into adulthood. This has ultimately created a deep-seated fear of sexual intimacy. As a result, these sentiments compelled them to resort to informal, community-based pharmacological practices to manage penetration anxiety, which eventually led to their use of poppers. However, rather than initially opting for poppers, they first experimented with local anesthetic gels including Jasocaine Gel (Lidocaine Hydrochloride). One participant explained that, before poppers became popular, this gel was widely used among the community. While these products reduced pain, they were also described as diminishing pleasurable sensations. As one participant described: "It removed the pain, but also the pleasure." (P6, 26, gay man, versatile)

Several participants contrasted this experience with poppers, which they perceived as facilitating relaxation without eliminating sensation. In this way, poppers were described as addressing a perceived gap between pain management and pleasure preservation. Notably, not all participants framed poppers in relation to trauma. However, those who did positioned poppers as a tool that facilitated sexual participation by reducing bodily tension rather than numbing the sensation. These narratives resonate with existing scholarship documenting that boys in Bangladesh experience sexual victimisation and coercive sex, and that these experiences can extend vulnerability into adulthood (Mozumder et al., 2016). Yet formal recognition and support for such experiences remain largely absent. In this context, poppers use emerged for some participants as an informal way of managing penetration-related anxiety — a community-level response to unmet needs where institutional care is unavailable.

Poppers as a gateway to fulfilling sexual fantasies and performance expectations

Beyond anxiety reduction, participants described poppers as an enabler of enacting specific sexual fantasies. Several participants' encounters were rooted in desires to fulfill "extreme" or "advanced" fantasies, e.g., double penetration or fisting. Several participants linked these desires to exposure to online pornography and digital sexual scripts. They believed pornography gave them sexual education and self-recognition of their own identities.

One participant recalled his epiphany of being queer, "While watching straight porn, I realised I identify more with women, than men. Once I developed the habit of watching gay porn, I felt that this is who I am." (P11, 31, transgender woman, bottom)

Participants described pornography as both affirming and pressuring. While it provided recognition and sexual education, it also introduced expectations about body image and sexual performance.

As one participant explained, "I thought I was having problems because I couldn't last as long as the people in videos. Other bottoms also started shaming me". (P12, 32, gay man, versatile)

This led him to self-medicate with sildenafil to ratify a self-diagnosed issue that emerged from mediated narratives. Because of pressure to fulfill these expectations, they felt the need to complete the sexual script. As poppers use is positioned within peer and digital spaces, participants viewed poppers as a prerequisite for specific sexual acts. Similarly, another participant described purchasing poppers after hearing about his friend's experience with double penetration, "When my friend used

Table 1

Summary characteristics of study participants ($N=17$).

Characteristic	n (%)
Age	
Range	19–37 years
Mean	~28 years
Gender Identity	
Gay man	15 (88.2%)
Transgender woman	2 (11.8%)
Sexual Role	
Versatile	10 (58.82%)
Bottom	4 (23.53%)
Top	2 (11.76%)
Not disclosed	1 (5.88%)
Polydrug use	
Yes	13 (76.47%)
No	4 (23.53%)
Substances used alongside poppers	
Alcohol	8 (47.06%)
Cannabis	10 (58.82%)
Methamphetamine	7 (41.18%)
Sildenafil	5 (29.41%)

poppers for double penetration, I decided to buy a bottle for group sex. The first time didn't feel good, but I felt like trying again." (P13, 32, gay man, bottom)

Across accounts, poppers were not only used to reduce discomfort but also to experiment with sexual scripts that were circulating within peer and digital spaces. Rather than functioning solely as a coping tool, poppers were described as expanding perceived possibilities of sexual experience.

Theme 2: techniques of regulation and labour of pleasure

In the absence of formal harm reduction guidance or medically endorsed information, participants described developing their own practical systems for using poppers. Poppers use emerged as what can be understood as a labour of pleasure: an ongoing process of learning, adjusting and regulating bodily responses to balance intensity, safety and sexual performance. This labour involved not only individual experimentation but also the circulation of informal rules within peer networks, constituted through embodied techniques, dosing practices and community responses to mishaps.

Poppers use as a learned bodily technique

Participants consistently described poppers use techniques as learned practices over time. Almost all participants reported knowing basic "rules", concerning safety. These rules were acquired through community networks, primarily sellers, sexual partners and peers.

Initial instructions often focused on what not to do. While many preferred known dealers introduced through close peers, participants turned to apps, e.g., Grindr when usual supply networks were disrupted during the pandemic. Additionally, participants acknowledged variation in usage. Some participants relied heavily on apps, while others engaged more cautiously or intermittently due to the fear of exposure. These dealers frequently warned buyers "not to swallow it" or "not to let it spill into the eyes." All participants confirmed their awareness of these instructions. One participant, both a regular user and a supplier, articulated this situation, "If something bad happened, we would all lose our privilege of using it safely without police attention." (P7, 27, gay man, versatile)

Additionally, several participants also reported being advised to experiment with poppers alone, mostly during masturbation, before incorporating it into partnered sex. As one participant explained, "It helped me understand how my body reacts, when feeling body pleasure and relaxation. So later, when using with my partner, I already knew how to manage it." (P6, 26, gay man, versatile)

Most participants claimed acquiring basic rules from the sellers, partners and peers but their accounts were less focused on formal instructions and more so on how repeated use trained them to read bodily cues.

Several participants also referred to dosage norms in the community, such as "two sniffs for a top and three for a bottom" in one sexual session. As one participant rationalised:

"If a top takes popper, his erection can soften. So, he usually takes one in the middle of sex and another closer to orgasm. For bottoms, we take one before penetration to relax and another if the vibe drops. It helps take a bigger penis." (P6, 26, gay man, versatile)

These practices were shaped not only by bodily effects but also by economic considerations. Participants noted that poppers, which were difficult to obtain in Bangladesh, were expensive, ranging from 3,000-5,000 BDT per bottle. As a result, participants used poppers judiciously, with some of them reserving poppers for particular partners or occasions. The "two-sniff" rule served as a resource-management strategy.

Concurrently, material properties of the substance influenced behaviour. Participants noted that opened bottles lost potency with

repeated air exposure, which encouraged more frequent use. One participant explained, "Once you break the seal, the more you open it, the weaker it gets. I need to finish it within 1-2 months, otherwise it goes to waste. That's why I ended up having sex more frequently." (P8, 28, gay man, bottom)

In this situation, economic scarcity and chemical volatility syndemically shaped patterns of poppers use.

While participants were attentive to safety concerns, decision-making around sexual health practices became more flexible. Some participants rationalised condom non-use through PrEP adherence or by trusting their partners. Others suggested that condoms reduced orgasm intensity when combined with poppers.

One participant explained, "When you insert and take poppers, you have to time it carefully so your penis stays hard. If you take too much, it suddenly goes soft. Then the condoms don't fit." (P17, 37, gay man, top)

In addition to dosage management, several participants described using poppers to intensify sex or to break the monotony of repeated encounters. As one participant recalled the quantity consumed could escalate significantly in group settings: "One partner brought a big bottle. By the end of the night, half of it was gone." (P9, 28, transgender woman)

Overall, poppers use emerged as a learned practice shaped through social instruction, repetition and bodily attunement. While community-based knowledge enabled participants to manage physiological effects and sexual expectations, it also normalised practices that often heightened sexual health risks in the absence of formal harm reduction.

Rule-making through mishaps

Findings revealed that while participants acquired knowledge about basic rules through sellers and peers, these rules were continuously revised through mistakes. Adverse experiences such as headaches, burns, dizziness and failed effects served as moments which recalibrated informal knowledge.

A primary concern is popper-induced dermatitis. When spilled on the skin, poppers can cause chemical burns or dermatitis. Due to limited provider knowledge and pervasive stigma in Bangladesh, participants often felt unable to disclose the cause of such injuries to doctors. As one participant explained, "It feels weird to explain why my nose has a burn. If the doctor asks, how do you explain? Won't he judge you? So, I go to the dealer or the group who knows these problems very well." (P3, 20, gay man, bottom)

Dermatitis was commonly cited, often resulting from the failure to follow advice such as "do not press the bottle against the nostrils." This risk was exacerbated in group-sex settings, involving larger quantities of poppers and reduced situational control. These mishaps fed into shared community experience, as individuals recounted negative outcomes and sought guidance. Injuries that were visible, painful or threatened sexual desirability generated especially urgent responses, prompting collective troubleshooting and knowledge sharing.

When dermatitis occurred, personal injuries were translated into collective lessons. Participants sought advice from Facebook groups or trusted peer network experts (further discussed in Theme 3). One participant recalled, "My first time was fine, but the second time I burned my nose. I asked the friend who got me into it, and he told me to put coconut oil on the burn." (P11, 31, transgender woman, bottom)

Several other participants mentioned a range of home remedies, most commonly coconut oil and aloe vera, and even cited toothpaste as a topical treatment.

Concerns about visible injury were shaped by anxieties around appearance, particularly among receptive partners. According to several participants, individuals who bottomed were often attentive to visible bodily marks. As one participant explained, "Many people who enjoy poppers are also bottom. Bottoms are very anxious about how they look and express themselves. So, when they get a burn, they feel the need to remove it." (P6, 26, gay man, versatile)

To avoid dermatitis, some participants described transferring

poppers into small bottles for nasal allergy drops. This paraphernalia could be easily inserted into the nostril, maximising the “buzz,” and minimising skin contact. One participant described how this technique spread through sexual encounters: “During sex, I learned that trick from one of my partners. You can even carry it like nasal drops.” (P6, 26, gay man, versatile)

Beyond dermatitis, participants identified other popper-related mishaps. Participants claimed intense headaches after poppers use. The use of Toughnil (tolfenamic acid), a painkiller, after poppers use was widely reported and normalised, without perceiving it as risky.

However, while physical injuries such as dermatitis and headaches and rules like “do not swallow poppers” generated collective vigilance, other risks were quietly negotiated. One example was the concurrent use of poppers and unprescribed sildenafil. Although some participants reported severe adverse effects such as dizziness and fainting, this information was rarely shared as a warning. As one participant stated, “I used poppers and Nirvana (a local sildenafil brand) together, which made me dizzy. After talking to you, I first learned it is dangerous. But people don’t talk about it much...it’s a private matter.” (P1, 19, gay man, versatile)

Participants also used poppers alongside alcohol or cannabis to intensify pleasure. However, only one participant (P15, 33, gay man, versatile) reported discussing such problems openly with others, indicating that these risks remained largely unspoken.

Within the community, discussing visible physical harm is acceptable, but admitting loss of control or sexual difficulty threatens masculinity. Therefore, community self-regulation remains strategically incomplete. Rather, it prioritises the management of visible, “accidental” harms while preserving social and emotional entitlements tied to sexual performance.

“It’s safe because it’s short”: Poppers as a community-devised harm reduction

For a subset of participants, poppers were interpreted as a “safer” substance and were sometimes adopted as an alternative to methamphetamine during sexual encounters. Participants described this shift not through formal medical knowledge but through experiential comparisons and peer discussions within the community.

Several participants reported that their initial interest in poppers emerged from attempts to move away from methamphetamine use during sex (locally referred to as “hi fun”). Methamphetamine was often described as producing intense stimulation but also incurred significant physical and social costs. One participant recalled:

“It gave me stamina for sex, but had horrible effects such as discomfort and reduced sleep. I couldn’t go to the office, and meth often gave me sexual impulses.” (P15, 33, gay man, versatile)

Another participant similarly described methamphetamine as producing “hyper-awareness, inability to sleep and teeth-grinding,” adding that, “I realised I couldn’t keep doing this.” (P11, 31, transgender woman, bottom)

Beyond these physiological effects, participants also described methamphetamine as carrying heightened legal and social risks. One participant explained that he nearly encountered police trouble while carrying methamphetamine, which led him to reconsider its use. (P7, 27, gay man, versatile) In contrast, poppers were perceived as less recognisable to law enforcement agencies and therefore less likely to attract legal scrutiny.

Within community narratives, methamphetamine use was frequently associated with loss of control and social stigma, whereas poppers were framed as comparatively “clean,” manageable and temporary, as one participant explained: “Meth sort of drives you crazy... but poppers doesn’t.” (P12, 32, gay man, versatile)

Another participant described his transition in explicitly evaluative terms, “I shifted to poppers as an alternative solution to meth. Meth is

dirty and made some of my friends crazy. I use poppers because it’s clean and quick.” (P17, 37, gay man, top)

These interpretations circulated informally within participants’ networks, where poppers were often described as “crash-free” and capable of enhancing sexual experiences without the prolonged stimulation associated with methamphetamine. One participant, who initially believed that poppers were primarily used by receptive partners, reported using it after observing its effects during sexual encounters, noting that poppers helped him regulate sexual pacing and enhance pleasure. (P10, 29, gay man, top)

Through repeated experiences and community exchanges, participants developed their own evaluative framework for comparing substances. Methamphetamine was described as producing “heat,” “loss of control,” and prolonged sleeplessness, whereas poppers were characterised as producing a brief, intense rush followed by a rapid return to baseline. As one participant summarized, “You feel it in your head and your heart beats fast, then you become normal again after a minute.” (P8, 28, gay man, versatile)

While these judgments were grounded in lived experience rather than biomedical knowledge, they illustrate how users actively negotiate risk and pleasure through informal infrastructures of knowledge circulating within their networks.

Theme 3: relational and networked ecologies of care

Access to poppers was not merely governed by individual choice. It was structured through relational hierarchies, class positioning and digital infrastructures which simultaneously enabled belonging and produced vulnerability. Participants’ accounts revealed that status, trust and visibility determined who accessed poppers, whose knowledge was authoritative and how risk was navigated — conditions that shaped not only what people knew, but who was permitted to know it. While Theme 2 focuses on embodied techniques which helped participants regulate pleasure and risk, Theme 3 examines digital and relational infrastructures which determined access to these techniques, influenced whose knowledge became authoritative and exposed users to new pathways to vulnerability.

Status, class and curated party culture

Participants frequently associated poppers use with status, fashion and “coolness” within certain urban queer circles. Because poppers were imported and relatively expensive, access itself functioned as a marker of social distinction. One participant explained that poppers were commonly used by people perceived as fashionable and socially visible within their communities, “People using them are very clean, well-dressed and fashionable. When they hang out, you either want to be with them or brag that you know them.” (P2, 19, gay man, versatile)

Another participant explicitly linked poppers use with being perceived as “cool” within the community, suggesting that the substance had symbolic value beyond its pharmacological effects.

Poppers were often introduced within closed-door house parties hosted by socially visible community members. These gatherings were described as carefully curated environments where participants felt protected from the risks associated with public spaces or unfamiliar encounters arranged online. One participant recalled the sense of safety these gatherings provided: “That setting was different for me. I knew everyone and knew no one would harm me.” (P1, 19, gay man, versatile)

Participants contrasted these gatherings with the uncertainty of meeting unfamiliar individuals through apps or public encounters, where fears of extortion, blackmail, or exposure were frequently mentioned (details described in Theme 3.3). In this context, parties functioned not only as social spaces but also as environments where trust and familiarity facilitated experimentation with practices that might otherwise have felt unsafe.

Within these gatherings, poppers use sometimes took on ritualised forms. Participants described passing a bottle in a circle and inhaling

sequentially, often accompanied by eye contact or shared anticipation. This rhythm of collective use created a moment of social permission where individuals felt more comfortable trying the substance in the presence of trusted peers. As one participant described, “When you offer someone a sniff and both inhale from the same bottle while making eye contact, that gives a sexual signal.” (P1, 19, gay man, versatile)

The bottle itself could also operate as a subtle marker of belonging in an insider circle. Some participants described posting aesthetically staged photos of unlabeled brown bottles on Instagram Stories. Although these posts did not explicitly reference poppers, recognition operated through shared insider knowledge, as one participant explained: “If you know what it is, you know what it is.” (P3, 20, gay man, bottom)

In this way, poppers circulated not only as pharmacological tools but also as symbolic objects within curated social networks. Participation in these spaces depended on relational trust, economic capacity and familiarity with the coded signals that structured belonging.

Trust: Safety net or bottleneck?

Participants repeatedly emphasised trust as a catalyst to poppers use, including purchasing poppers, assessing product safety and determining whose guidance to follow in the absence of formal regulation or scientific guidance. Participants relied on peers perceived as knowledgeable, whose authority was built through narratives of experimentation, travel and experience that circulated within community networks. One participant explained:

“I don’t know many brands, only English and Rush. So, I asked ‘W’. He travels to many countries and tries poppers there. American, UK, European, Thai. I wanted to buy a good one that would last because importing is expensive. He told me to keep it in the refrigerator and let it normalise before use. It really helps.” (P1, 19, gay man, versatile)

When asked why community members helped one another, many participants described a sense of collective responsibility. Sharing information was often necessary in the absence of formal support systems. As one participant stated, “If someone gets information about which poppers are better, which one are cheaper but gives a good vibe, or what to do if it spills, I tell them. Since no one else cares, I shouldn’t stop.” (P17, 37, gay man, top)

However, this care was not purely altruistic. Several participants noted that offering advice generated reciprocity and enhanced their community standing. Helping others fostered social visibility and credibility, increasing the likelihood of subsequently receiving support.

Within digital spaces, certain people served as informal harm reduction authorities. Credibility in these networks was unevenly distributed and based on three forms of capital: transnational experience which conferred expertise; social visibility, such as hosting parties or maintaining a large online following; and experiential storytelling, including naming multiple brands or describing poppers in vivid detail, despite challenges in verifying these experiences. As one participant explained, “When someone who lived in London gives advice, people listen more than when local guys share experiences.” (P16, 35, gay man, versatile)

However, trust also exposed users to misinformation and risk. Within the gay party culture, poppers use characterised “coolness,” and extensive experimentation often conferred guru status. One “community expert” described learning through self-experimentation, including pouring poppers into a plastic bag and inhaling it “like glue.” (P10, 29, gay man, top)

When asked about safety, he framed it as a “different kind of experience.” Others, particularly newer community members, reported discomfort in questioning such figures. As one participant explained, “I feel afraid to ask them things. What if they judge me? What if I was wrong?” (P5, 24, gay man, versatile)

When negative experiences occurred, participants rarely held peers

accountable, rather they blamed the product. When poppers failed to achieve the desired effects, they were told by peers and gurus that they purchased counterfeit “Chinese” poppers. As one participant explained, “When I don’t get high, I talk to my friends or the dealer. They say it’s probably a Chinese copy. The strong ones are American, followed by European.” (P8, 28, gay man, bottom)

Trust also structured economic exchanges within the community. Given the high cost of poppers, a small secondary market emerged where individuals sold partially used bottles at reduced prices. As one participant explained:

“After 1-2 months, poppers loses its strength. It gives more headache than pleasure. But some people still buy the leftover bottle for a quarter of the price. I used to give them away, but now I sell them. I mean, why not?” (P10, 29, gay man, top)

Within this ecology of informal exchange, trust characterised both a safety infrastructure and an epistemic bottleneck. Trust was relational rather than procedural, therefore questioning advice or assigning blame ran the risk of social rupture. In the absence of formal regulation, participants relied on others’ intentions and experiences. While this trust enabled mutual care, it also limited accountability. When harm occurred, it was often rationalised (“He didn’t know better”) rather than confronted.

Digital platforms as precarious infrastructures

Digital platforms such as Grindr, Telegram, Instagram and Blued played a central role in how participants located partners, sourced poppers and exchanged coded information. In a context where public venues and formal harm reduction services were largely absent or unsafe, these apps functioned as essential infrastructures which circulated queer connection and drug-related knowledge. Across interviews, digital platforms were found to be serving two primary functions: finding hookup partners and sourcing chemsex-related substances, particularly poppers.

One participant explained techniques used to locate poppers on Grindr, “There are always some people who use symbols like a bottle, fireworks, a brain emoji or write that they ‘love to do intense things.’” (P8, 28, gay man, bottom)

Participants described that anonymity on Grindr is a double-edged sword. On one hand, fake or anonymous profiles posed a serious risk, as right-wing groups used such profiles to identify and expose gay men. However, ambiguity became a navigational resource. As one participant explained, “These fake accounts often use stock photos of muscular, ‘non-Bangladeshi’ bodies but write in Bangla. That mismatch is actually a signal. It tells you this person is one of us.” (P17, 37, gay man, top)

Here, “one of us” referred specifically to individuals involved in poppers use and supply — recognisable through the combination of anonymous photographs, Bangla text and the coded symbols described above. In this way, uncertainty did not eliminate risk but produced a form of digital literacy, allowing insiders to identify poppers-involved profiles while remaining invisible to hostile actors.

Transactions typically occurred in public locations and buyers immediately deleted all messages. A small number of participants also reported sourcing poppers through Instagram, Blued and Telegram, though Grindr was the predominant source.

Beyond access, platforms enabled systems of coded communication and informal learning. Participants reported encountering social media posts on platforms such as Instagram Stories and Blued, featuring images of unbranded bottles.

As one participant explained, “If you know what it is, you know what it is. I recognised it immediately from the shape, size and the colour of the cap.” (P13, 32, gay man, bottom)

These posts and exchanges functioned as informal help channels, through which users learned the norms of poppers by interacting with and observing more experienced community members. However,

participants emphasised that the knowledge circulating on these platforms was often partial, context-specific and internally contradictory. As one participant captured the confusion:

“One guy says not to mix it with alcohol, another says it’s fine. I don’t know who to follow, so I just go with what feels right.” (P10, 29, gay man, top)

When asked about online advice that caused confusion, participants consistently described three patterns: contradictory guidance from perceived “expert” figures; myths presented as facts; and persistent uncertainty about what information could be trusted. Rather than reflecting individual ignorance, this epistemic instability was described as a structural feature of these informal infrastructures, where information circulated without standardised verification. Misinformation associated with high-status community members often became hard to challenge. Newer or less visible users were particularly hesitant to ask questions, as they feared judgment or social exclusion.

Finally, participants emphasised that the same platforms which enabled connection also exposed them to serious digital vulnerabilities. Most participants vocalised fears of their gay status being exposed. One participant illustrated this risk:

“Facebook groups are helpful. I learned everything there. But I’m terrified of screenshots. Last year, someone from our group was exposed through screenshots sent to his institute. It was about a party where he dressed like a girl. Right-wing groups threatened him, and his friends stopped talking to him at university. He felt suicidal. Now I read everything but post almost nothing. The same space that saved me could also destroy me.” (P3, 20, gay man, bottom)

Although participants did not report documented arrests linked to app-based surveillance, pervasive fear of informal monitoring by family, neighbors, or hostile peers shaped online behaviours.

In this sense, digital platforms functioned as improvised infrastructures that organised access, information and queer belonging in the absence of formal support. While these networks enabled connection and care, they remained fragile, dependent on trust, ambiguity and informal rules. The same infrastructures that sustained the community also constrained what could be questioned, shared, or made visible.

Thus, these findings suggest that poppers use among participants was not an individual practice, rather a socially coordinated process. Participants described how bodily experiences of pleasure and relaxation were learned and refined through collective techniques of use, while access to substances and knowledge was organised through stratified social networks and precarious digital infrastructures. These interconnected layers shaped how poppers circulated, how users understood risks and how community members navigated both care and vulnerability in the absence of formal support systems.

Discussion

This article examines how poppers use among GSDP in Bangladesh is shaped through informal infrastructures of intimacy amid criminalisation and structural neglect. Moving beyond biomedicalised framings, the analysis shows how social networks, digital platforms and community norms organise access, learning, risk management and pleasure in the absence of formal harm reduction systems. It further examines how these formations influence access to drugs, information sharing and rules of safety surrounding poppers use.

Moreover, this is the first qualitative exploration in the South Asian region, barring a report in Pakistan that mentioned poppers use. This analysis provides insights into poppers use in an environment that prohibits homosexuality and drug use. While the Pakistan-based report mentions poppers use, its methodological and conceptual limitations, such as the lack of person-centric lenses, inhibit a holistic understanding of the social circumstances surrounding poppers use. Although several quantitative studies examined poppers use in the Asia-Pacific region,

only a few qualitative studies exist to our knowledge (Chin, 2020). However, our research attempts to bridge these gaps by investigating meanings that GSDP ascribe to poppers use.

While three sub-objectives underpinned this analysis, this discussion section is structured around two key thematic areas guided by the infrastructures of intimacy framework: 1. Community-based informal systems of information sharing; and 2. Meanings attached to poppers use. Both themes depict how intimate networks serve as informal infrastructures influencing poppers use.

One of our central findings is that, in the absence of formal institutional healthcare support or regulatory policies, the GSD community in Bangladesh devised their own informal harm reduction system. Findings showed that participants leveraged online and offline infrastructures to learn techniques, share information and minimise risk, a practice mirrored in other studies. For instance, a study in Los Angeles documented how people who use opioids developed peer-based strategies and moral economies of care to keep one another safe (Gould et al., 2025). Similarly, harm reduction research shows that users operationalise harm reduction through socially produced principles and practices rather than clinics (Owczarzak et al., 2024). Similarly, an Indonesia-based study revealed that MSM developed “social risk-management” systems to counter stigma, policing and service gaps (Nevendorff et al., 2025). The Indonesian study, however, describes community risk management in a context of partial service availability. In contrast, our study provides novel evidence on how these systems operate under conditions of structural neglect and policing.

Our findings also revealed a distinct pattern. While the rituals, distribution networks and informal risk management practices associated with methamphetamine (locally referred to as “yaba”), cannabis and other drugs emerged within heterosexual populations, the poppers market we observed is primarily situated within GSDP communities. This makes our case one of the few documented examples in which harm reduction knowledge and practices originated endogenously from a queer network, as opposed to being adapted from mainstream drug cultures. These community-driven knowledge systems, thus, demonstrate how participants actively navigate risk and pleasure under conditions of structural neglect and criminalisation, while also revealing the limits of informal infrastructures in the absence of medical knowledge and formal harm reduction support (Gould et al., 2025). By documenting this process, our study aligns with emerging poppers and chemsex scholarship that resists portraying GSDP as victims and foregrounds them as active agents who create meaning, negotiate risk and pursue pleasure within restrictive socio-cultural conditions (Møller & Hakim, 2023; Schwartz et al., 2022).

Several participants described reducing or discontinuing methamphetamine use during sex following adverse experiences and turning instead to poppers, which they described as “clean.” According to recent surveillance data, approximately three-quarters of the Bangladeshi MSM and *hijra* who engaged in illicit drug use also reported methamphetamine use (ASP, 2017). Although only a small number of participants described a shift from methamphetamine to poppers (n=4), their narratives illuminate how relative safety is constructed within the community.

This folk category of “clean” drug is analytically significant: it reveals that participants were not simply selecting a pharmacologically safer substance, but constructing a locally meaningful distinction between drugs that threaten social visibility and bodily autonomy and those that do not. This perception is not without pharmacological basis. Methamphetamine’s extended duration of action, capable of structuring sessions lasting many hours, has been shown to prolong sexual encounters and contribute to loss of control and unintended risk behaviours in chemsex settings (Giorgetti et al., 2017; Maxwell et al., 2019). Poppers, as short-acting vasodilators whose effects dissipate within seconds to minutes, do not produce this temporal capture (Pepper, 2021). It is important to note, however, that this represents a constraint of the drug rather than a cognitive achievement by the user: poppers do not confer

greater willpower, but they lack the pharmacological capacity to hijack a session for two days (Ferreira et al., 2022; Schifano et al., 2025). The perception of control, while experientially real to participants, is therefore better understood as the absence of pharmacological override than as the presence of enhanced agency.

This distinction matters for harm reduction because the risks it leaves unaddressed are precisely those absent from peer discourse. Poppers carry acute hazards that are invisible in everyday use and therefore unlikely to enter community safety narratives (Barrangou-Pouey-Darlas et al., 2021; Pepper, 2021). More critically, poppers are associated with higher rates of condomless receptive anal sex, an effect mediated by sphincter relaxation and pain reduction rather than by the disinhibition and compulsivity that characterise stimulant use (Abdalla et al., 2024; Maxwell et al., 2019; Vaccher et al., 2020). The community's "clean" framing captures reduced risks of dependence, police exposure, and functional impairment, but leaves users potentially more exposed to sexual transmission risk — a blind spot that formal harm reduction programming could specifically target without dismantling the community's existing harm logic. What this pattern reveals more broadly is a redefinition of safety under conditions of criminalization: in contexts where both drug use and same-sex intimacy are legally prosecuted, safety is understood not in clinical terms as the absence of toxicity, but as low visibility and high reversibility — the capacity to use, recover quickly, and leave no trace that could attract legal or social sanction (Banik et al., 2023; Demant & Oviedo-Trespalacios, 2019; Yu & Lasco, 2025). From the perspective of infrastructures of intimacy, perceived drug hierarchies can be understood as part of the informal infrastructures through which communities coordinate pleasure, safety, and discretion in environments where formal support systems are absent (Berlant, 1998; Wilson, 2016). This finding extends existing scholarship on lay harm management, which shows that people who use drugs develop practical strategies for negotiating risk through peer knowledge and social networks (Rhodes, 2009). In heavily criminalized contexts, such hierarchies may be organized not only around biomedical risk but also around what might be termed state legibility — the degree to which drug effects render users visible and vulnerable to external intervention (Owczarzak et al., 2021; Rubalcava Hernandez et al., 2025).

A comparison with recent qualitative work from the Philippines further sharpens the theoretical contributions of this study (Yu & Lasco, 2025). It similarly documents how MSM construct poppers as a "clean" alternative to methamphetamine within a punitive drug policy environment, theorised through edgework and sociopolitical harmlessness. Our findings parallel this pattern but offer a conceptually distinct explanation. In Bangladesh, where both homosexuality and drug use are simultaneously criminalised, the "clean" designation can be understood through the lens of state legibility, whereby substances are evaluated by whether their effects render users visible and vulnerable to sanction rather than by biomedical toxicity alone (Alam & Marston, 2023). This distinction is evident across our findings. Unlike the Philippines, where poppers' legal grey area enables relatively open digital commerce and more casual use, digital platforms in Dhaka function as precarious infrastructures shaped by surveillance risk and the fear of forced exposure (Nevendorff et al., 2025). Similarly, whereas participants in the Philippine study framed poppers as both biomedically and socio-politically harmless, our participants developed active forms of folk pharmacology under conditions where formal healthcare remained structurally inaccessible, suggesting that community harm reduction knowledge is shaped not only by the harms encountered but also by the institutional options available to address them (Owczarzak et al., 2024; Rhodes, 2009; Yu & Lasco, 2025). Together, these contrasts further illustrate Wilson's (2016) argument that infrastructures of intimacy are materially conditioned by regulatory environments rather than defined by platform affordances or individual risk perception (Wilson, 2016).

Previous research in the Asian region has also reported patterns of self-regulation among MSM engaged in sexualised drug use. A study in

Indonesia described secrecy through coded terminology, selectiveness and moderation in the frequency of drug use (Nevendorff et al., 2025). Our findings expand on them by defining "moderation" as sharing visible harm experiences (e.g., poppers dermatitis) and circulating dosing/safety tips (e.g. not swallowing), often anonymously, within peer channels. These practices operate as community-level innovations that partially substitute for clinical guidance under criminalisation, institutional vacuum and stigma, consistent with risk environment accounts of how harm reduction infrastructures arise within communities when formal systems fail (Rhodes, 2009).

Our findings extend the infrastructures of intimacy framework by illustrating how informal drug use knowledge circulates through improvised digital and relational infrastructures in a context where both same-sex intimacy and drug use remain criminalised (Wilson, 2016). In this sense, infrastructure constitutes improvised social arrangements where people coordinate care and risk (Wilson, 2016). This demonstrates that intimacy is mediated via community and digital networks. Participants' narratives of Grindr and Telegram functioning as infrastructures of circulation align with research in Southeast Asia, where diverse types of marginalised groups build digital infrastructures that sustain intimacy while circumventing formal gatekeepers (Lim, 2024). Further, participants' reliance on personal credibility and relational trust as substitutes for absent public health systems echoes scholarship on "affective infrastructure," where trust circulates as social technology under institutional absence (Zhang, 2023).

Within this framework, previous research also revealed alternative infrastructures that emerged during poppers crackdowns in Canada in 2013. These incidents redirected access to unregulated backchannels, thus causing a rupture in the infrastructure (Schwartz et al., 2023). However, our findings indicated a structural vacuum that caused intimate infrastructures to spontaneously evolve to sustain connection, safety and pleasure. Yet, this emergent infrastructure is stratified, shaped by unequal access to digital capital, social capital, class and network visibility, thus revealing latent power dynamics. Drawing on a Foucauldian interpretation of power being relational and productive, our findings indicate that credibility and authority permeate throughout networks built for mutual care (Foucault, 1978; Rose, 2001). These circulations complicate rather than undermine solidarity, revealing how collective care infrastructures protect and stratify communities.

The infrastructure of intimacy framework also resonated throughout the infrastructures constructing the meanings and motivations of poppers use. In Bangladesh, where homosexuality remains largely unspoken and stigmatised, around 64.7% of the GSDP reported traumatic early sexual experiences, including sexual abuse (Mozumder et al., 2016). To alleviate the anxiety and discomfort associated with penetration, i.e., instilling feelings of being "relaxed" or "feeling ready", some participants previously used local anesthetic gels to navigate the tension between trauma and intimacy (Wilson, 2016). This embodies an infrastructure-as-tool. Within this trajectory, poppers appear as a subsequent technological adaptation, enabling users to transform memories of pain into connection and pleasure. In this sense, poppers use illustrates bodily techniques that emerge within constrained infrastructures of care (Wilson, 2016).

This category reflected other findings such as enacting sexual fantasies and seeking sexual recognition (Nevendorff et al., 2025; Pepper, 2021; Schwartz et al., 2020). Specifically, our findings captured poppers as a harm reduction alternative to methamphetamine. While participants' perception that poppers carry fewer overt harms than methamphetamine is broadly consistent with existing pharmacological evidence, their understanding of safety was selectively oriented toward visible and socially salient harms, such as loss of control or functional disruption. Within these community infrastructures of knowledge, certain poppers-specific risks — including interactions with erectile dysfunction medications and ocular complications — were less consistently recognised or circulated. This orientation toward safety was also reflected in patterns of substance use. Aligning with global patterns of

concurrent substance use, we observed poppers used alongside alcohol, cannabis, or medicines for erectile dysfunction, but rarely with methamphetamine, thus showing their selective avoidance of stigmatised substances. Notably, our participants were self-identified gay men, who came from higher-class, cosmopolitan backgrounds. Thus, this positionality may reflect concerns about maintaining social respectability and control, influencing their preference for certain harm reduction strategies. In this context, poppers also functioned as a symbolic marker of status within certain urban queer circles. Since poppers are imported and relatively expensive, access signaled economic and social distinction. Participants associated poppers use with being “modern”, “clean” or part of more cosmopolitan networks. These spaces did not merely facilitate drug use but also characterised belonging, taste and class positioning within urban queer networks.

Implications of findings and recommendations

The findings showed contextualised narratives, rooted in internal motivations and community norms, driving poppers use. While the infrastructure of the intimacy framework positioned poppers use within relational community norms and challenging structural environments, it also revealed certain risk behaviours which could undermine future formal harm reduction practices. For instance, findings revealed that communities had selective control of information about risky practices. In this context, complexities related to misinformation and informational gatekeeping need to be urgently addressed. Specifically, harm reduction efforts for poppers use should complement rather than replace community systems. For example, digital harm reduction strategies that also acknowledge pleasure could include peer-moderated Telegram channels or infographics that normalise pleasure while correcting misinformation: including guidance on avoiding poppers-sildenafil interactions, preventing skin burns or recognising warning signs warranting medical attention. Moreover, community-led and peer-driven interventions demonstrated effectiveness in criminalised, stigmatised contexts by enhancing cultural acceptability, trust and reach. Therefore, such interventions need to be leveraged for circulating correct knowledge whilst addressing overlooked risks. Given the central role of digital infrastructures in informational exchange, tailored health messages need to be integrated within social media platforms, preferably by peer service providers. Finally, interventions need to adopt pleasure-acknowledging frameworks. Recognising pleasure as central to sexual wellbeing, rather than criminalising it, is consistent with emerging evidence that pleasure-acknowledging sexual health interventions enhance sexual safety (Race, 2017).

Study limitations and directions for future research

This analysis is based on participants’ narratives as opposed to direct observations of online or offline practices. Therefore, it was not possible to document the temporal dynamics of online exchanges and community-grounded harm reduction practices. As this study was focused only on higher-socioeconomic self-identified gay men and educated transgender women, the context may not represent less networked MSM or hijra predominantly belonging to lower socio-economic strata, whose access to information and support may differ considerably. Therefore, the scholarship would benefit from future ethnographic research that captures these variations. Future research using quantitative approaches could further examine the prevalence and distribution of these practices across broader populations.

Funding details

This work was supported by the Department of Foreign Affairs, Trade, and Development (DFATD) through Advancing Sexual and Reproductive Health and Rights (AdSEARCH), Grant number: SGDE-EDRMS-#9926532, Purchase Order 742885, Project P007358 (under

Work Package 3).

Data availability statement

Due to the sensitive nature of the data and the safety concerns faced by this highly vulnerable, marginalized population, we have not deposited these data in an online repository. However, upon reasonable request from the Research Administration of icddr,b, the data can be made available.

Ethical approval statement

This study received the ethical approval from the Ethical Review Committee of the Institutional Review Board of the International Centre for Diarrhoeal Diseases Research, Bangladesh (icddr,b) (approval number: PR-22033). As this study involved human participants, this study adhered to the principles of the Declaration of Helsinki.

CRediT authorship contribution statement

Pritom Kumar Das: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Samira Dishti Irfan:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Conceptualization. **Jahidul Islam Imran:** Writing – review & editing, Writing – original draft, Software, Resources, Investigation, Formal analysis, Data curation. **Sharful Islam Khan:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization.

Declaration of competing interest

Authors declared they have no competing interests.

Acknowledgements

icddr,b is grateful to the Governments of Bangladesh and Canada for providing core/unrestricted support.

References

- Abdalla, K. B., da Silveira, D. X., & Fidalgo, T. M. (2024). Poppers use and HIV infection—A literature review. *Sexual Medicine Reviews*, 12(1), 67–75.
- Alam, P., & Marston, C. (2023). Bending against straightening devices: queer lived experiences of sexuality and sexual health in Bangladesh. *BMC Public Health*, 23(1), 173.
- ASP. (2017). *Behavioural and Serological Surveillance on males having sex with males, male sex workers and hijra*. Technical Report.
- Bae, K., Ji Kwon, N., & Han, E. (2018). A review on the abuse of three NPS (synthetic cannabinoids, kratom, poppers) among youths in Asia. *Forensic Science International*, 292, 45–49.
- Banik, S., Khan, M. S. I., Jami, H., Sivasubramanian, M., Dhakal, M., & Wilson, E. (2023). Social determinants of sexual health among sexual and gender diverse people in South Asia: Lessons learned from India, Bangladesh, Nepal, and Pakistan. *Transforming unequal gender relations in India and beyond: An intersectional perspective on challenges and opportunities* (pp. 327–352). Springer.
- Barrangou-Pouey-Darlas, M., Gerardin, M., Deheul, S., Istvan, M., Guerlais, M., Fan, Jolliet, P., Dejoie, T., & Victorri-Vigneau, C. (2021). Poppers use and high methaemoglobinaemia: ‘Dangerous liaisons’. *Pharmaceuticals*, 14(10), 1061.
- Berlant, L. (1998). Intimacy: A special issue. *Critical Inquiry*, 24(2), 281–288.
- Berlant, L. (2016). The commons: Infrastructures for troubling times. *Environment and Planning D: Society and Space*, 34(3), 393–419.
- Blumer, H. (2017). What is wrong with social theory?. *Sociological methods* (pp. 84–96). Routledge.
- Boonchutima, S., & Kongchan, W. (2017). Utilization of dating apps by men who have sex with men for persuading other men toward substance use. *Psychology Research and Behavior Management*, 31–38.
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589–597.
- Chin, K.-Y. (2020). Recreational inhaled nitrite use among Asian men who have sex with men—A review. *Journal of Men's Health*, 16(3), 109–127.

- Demant, D., & Oviedo-Trespacios, O. (2019). Harmless? A hierarchical analysis of poppers use correlates among young gay and bisexual men. *Drug and Alcohol Review*, 38(5), 465–472.
- Ferreira, P. M., Winstock, A. R., Schlag, A. K., Brandner, B., Henderson, G., Miller, I., van Amsterdam, J., Phillips, L. D., Taylor, P., & Gittins, R. (2022). A comparative study of the harms of nitrous oxide and poppers using the MCDA approach. *Drug Science, Policy and Law*, 8, Article 20503245221127301.
- Foucault, M. (1978). *The history of sexuality: Vol. 1. An introduction* (R. Hurley, Trans.). New York: Pantheon.
- Giorgetti, R., Tagliabracci, A., Schifano, F., Zaami, S., Marinelli, E., & Busardò, F. P. (2017). When “chems” meet sex: A rising phenomenon called “chemsex”. *Current Neuropharmacology*, 15(5), 762–770.
- Gould, E. E., Ganesh, S. S., DiMario, A. J., Huh, J., Bluthenthal, R. N., & Ceasar, R. C. (2025). You take care of people, people will take care of you”: Moral Economies and an Unpredictable Drug Market. *PLoS One*, 20(4), Article e0320423.
- Guadamuz, T. E., & Boonmongkon, P. (2018). Ice parties among young men who have sex with men in Thailand: Pleasures, secrecy and risks. *International Journal of Drug Policy*, 55, 249–255.
- Hidaka, Y., Ichikawa, S., Koyano, J., Urao, M., Yasuo, T., Kimura, H., Ono-Kihara, M., & Kihara, M. (2006). Substance use and sexual behaviours of Japanese men who have sex with men: a nationwide internet survey conducted in Japan. *BMC Public Health*, 6(1), 239.
- icddr, b (2024). *Establishing a surveillance system on sexual and reproductive health and rights (SRHR) of key populations (KPs) at risk of compromised outcome of SRHR*. Bangladesh: International Centre for Diarrhoeal Diseases Research.
- Irfan, S. D., Reza, M., Morshed Khan, M. N., Hassan, R., & Islam Khan, S. (2026). The benefits do not reach us’: Analyzing the discrepancies between the state recognition of hijra and their reality in Dhaka, Bangladesh. *Critical Public Health*, 36(1), Article 2598985.
- Irfan, S. D., Sarwar, G., Emran, J., & Khan, S. I. (2023). An uncharted territory of sexualized drug use: exploring the dynamics of chemsex among young and adolescent MSM including self-identified gay men in urban Dhaka, Bangladesh. *Frontiers in psychology*, 14, Article 1124971.
- Khan, S. I., Hussain, M. I., Parveen, S., Bhuiyan, M. I., Gourab, G., Sarker, G. F., Arafat, S. M., & Sikder, J. (2009). Living on the extreme margin: Social exclusion of the transgender population (hijra) in Bangladesh. *Journal of Health, Population, and Nutrition*, 27(4), 441.
- Li, D., Yang, X., Zhang, Z., Qi, X., Ruan, Y., Jia, Y., Pan, S. W., Xiao, D., Jennifer Huang, Z., & Luo, F. (2014). Nitrite inhalants use and HIV infection among men who have sex with men in China. *BioMed Research International*, 2014(1), Article 365261.
- Lim, M. (2024). *Social media and politics in Southeast Asia*. Cambridge University Press.
- Marques Oliveira, P., Sousa Reis, C., & Vieira-Coelho, M. A. (2023). Getting inside the mind of gay and bisexual men who have sex with men with sexualized drug use—A systematic review. *International Journal of Sexual Health*, 35(4), 573–595.
- Maxwell, S., Shahmanesh, M., & Gafos, M. (2019). Chemsex behaviours among men who have sex with men: A systematic review of the literature. *International Journal of Drug Policy*, 63, 74–89.
- Measham, F., McCormack, M., Simmons, H., & Wignall, L. (2025). Poppers, the politics of exemption and the characteristics of poppers users in the annual English Festival Study, 2014–23. *The British Journal of Criminology*, 65(3), 578–597.
- Mimiaga, M. J., Klasko-Foster, L., Santostefano, C., Jin, H., Wyrton, T., Hughto, J. W., & Biello, K. (2024). Global epidemiology and social-ecological determinants of substance use disparities, consequences of use, and treatment options among sexual and gender minority populations. *Global LGBTQ Health: Research, Policy, Practice, and Pathways* (pp. 221–270). Springer International Publishing Cham.
- Møller, K., & Hakim, J. (2023). Critical chemsex studies: Interrogating cultures of sexualized drug use beyond the risk paradigm. *Sexualities*, 26(5–6), 547–555.
- Mozumder, M. K., Haque, M. A., Jasmine, U. H., Royal, R. I., & Sharmin, R. (2016). Behavior and experience of male homosexuals in Bangladesh. *Bangladesh Journal of Psychiatry*, 30(2), 41–44.
- Myung, L., & Kasper, W. P. (2024). Sex, drugs & innovation law: Regulating the legality of “poppers”. *California Law Review*, 112, 1399.
- Nevendorf, L., Bourne, A., Stoové, M., & Pedrana, A. (2025). Generative tension and social risk management surrounding sexualised drug use practice among men who have sex with men in highly stigmatised environments: A qualitative study from Jakarta, Indonesia. *International Journal of Drug Policy*, 135, Article 104683.
- Owczarzak, J., Kazi, A. K., Mazhnaya, A., Alpatova, P., Zub, T., Filippova, O., & Phillips, S. D. (2021). “You’re nobody without a piece of paper:” visibility, the state, and access to services among women who use drugs in Ukraine. *Social Science & Medicine*, 269, Article 113563.
- Owczarzak, J., Martin, E., Weicker, N., Evans, L., Morris, M., & Sherman, S. G. (2024). A qualitative exploration of harm reduction in practice by street-based peer outreach workers. *Harm Reduction Journal*, 21(1), 161.
- Paasonen, S. (2017). Infrastructures of intimacy. *Mediated intimacies* (pp. 103–116). Routledge.
- Pepper, N. (2021). *Use of nitrite inhalants (poppers) among people with and at-risk for HIV*. San Diego State University.
- Race, K. (2017). *The gay science: Intimate experiments with the problem of HIV*. Routledge.
- Rhodes, T. (2009). *Risk environments and drug harms: A social science for harm reduction approach*, 20 pp. 193–201. Elsevier.
- Rose, N. (2001). The politics of life itself. *Theory, Culture & Society*, 18(6), 1–30.
- Rubalcava Hernandez, E. J., Bayhi, J. L., Herron, C., Dew, S., Margaritis, W., DeBerry, L. S., & Nava, M. (2025). The public health consequences of officer discretion in arrests affecting LGBTQ+ communities in the United States: A scoping review. *Health & Justice*, 13(1), 68.
- Saldaña, J. (2021). *The coding manual for qualitative researchers*.
- Samuel, K. (2021). *Chemsex on the rise in Thailand and other Asian countries*. Aidsmap. <https://www.aidsmap.com/news/jul-2021/chemsex-rise-thailand-and-other-asian-countries>.
- Schifano, F., Bonaccorso, S., Arillotta, D., Guirguis, A., Corkery, J. M., Floresta, G., Papanti Pelletier, G. D., Scherbaum, N., & Schifano, N. (2025). Drugs used in “chemsex”/sexualized drug behaviour—Overview of the related clinical psychopharmacological issues. *Brain Sciences*, 15(5), 424.
- Schwartz, B. G., & Kloner, R. A. (2010). Drug interactions with phosphodiesterase-5 inhibitors used for the treatment of erectile dysfunction or pulmonary hypertension. *Circulation*, 122(1), 88–95. <https://doi.org/10.1161/circulationaha.110.944603>
- Schwartz, C., Card, K., Elliott, R., Hollett, K., Jollimore, J., Pasic, A., Smiley, S., Tooley, L., Pruden, H., & Knight, R. (2023). Assessing options for poppers policy in Canada: A call to action for evidence-based policy reform. *International Journal of Drug Policy*, 115, Article 104017.
- Schwartz, C., Fast, D., & Knight, R. (2020). Poppers, queer sex and a Canadian crackdown: Examining the experiences of alkyl nitrite use among young sexual minority men. *International Journal of Drug Policy*, 77, Article 102670. <https://doi.org/10.1016/j.drugpo.2020.102670>
- Schwartz, C., Tooley, L., Knight, R., & Steinberg, M. (2022). Queering poppers literature: a critical interpretive synthesis of health sciences research on alkyl nitrite use and Canadian policy. *International Journal of Drug Policy*, 101, Article 103546.
- Shahid, E., Saleem, A., & Fasih, U. (2022). First case report of Poppers Maculopathy with Cannabis (Charas) in Pakistan. *Journal of Ayub Medical College Abbottabad*, 34(4), 888–890.
- Tan, R. K. J., O’Hara, C. A., Koh, W. L., Le, D., Tan, A., Tyler, A., Tan, C., Kwok, C., Banerjee, S., & Wong, M. L. (2021). Delineating patterns of sexualized substance use and its association with sexual and mental health outcomes among young gay, bisexual and other men who have sex with men in Singapore: A latent class analysis. *BMC Public Health*, 21(1), 1026.
- Vaccher, S. J., Hammoud, M. A., Bourne, A., Lea, T., Haire, B. G., Holt, M., Saxton, P., Mackie, B., Badge, J., & Jin, F. (2020). Prevalence, frequency, and motivations for alkyl nitrite use among gay, bisexual and other men who have sex with men in Australia. *International Journal of Drug Policy*, 76, Article 102659.
- Wang, H., Jonas, K. J., & Guadamuz, T. E. (2023). Chemsex and chemsex associated substance use among men who have sex with men in Asia: A systematic review and meta-analysis. *Drug and Alcohol Dependence*, 243, Article 109741.
- Wilson, A. (2016). The infrastructure of intimacy. *Signs: Journal of Women in Culture and Society*, 41(2), 247–280.
- Yu, V. G., & Lasco, G. (2025). Neither legal nor illegal: Poppers as ‘acceptable’ chemsex drugs among men who have sex with men in the Philippines. *International Journal of Drug Policy*, 144, Article 104004.
- Zhang, A. (2023). Trust as affective infrastructure: Constructing the firm/community boundary in resource extraction. *The Cambridge Journal of Anthropology*, 41(2), 71–86.
- Zhang, H., Teng, T., Lu, H., Zhao, Y., Liu, H., Yin, L., Sun, Z., He, X., Qian, H.-Z., & Ruan, Y. (2016). Poppers use and risky sexual behaviors among men who have sex with men in Beijing, China. *Drug and Alcohol Dependence*, 160, 42–48.
- Zhao, P., Tang, S., Wang, C., Zhang, Y., Best, J., Tangthanap, T. M., Huang, S., Yang, B., Wei, C., & Tucker, J. D. (2017). Recreational drug use among Chinese MSM and transgender individuals: Results from a national online cross-sectional study. *PLoS One*, 12(1), Article e0170024.