

Technology harm reduction strategies for gay, bisexual and other men who have sex with men engaging in chemsex

因應性行為合併使用物質的科技減害策略

研究計畫書

A. SPECIFIC AIMS

The practice of sexualised drug use is historical and has been noted across a diversity of genders and people of various sexual orientations. The term "chemsex" has been used to specifically describe the use of psychoactive substances in sexualised settings among gay, bisexual, and other men who have sex with men (GBMSM), particularly stimulants like methamphetamine and mephedrone, or other drugs like γ -hydroxybutyrate (GHB), γ -butyrolactone (GBL). Chemsex among GBMSM has coincided with the emergence of sexual-networking mobile apps, creating new opportunities for finding new partners with the intention to engage in chemsex.

Harm reduction strategies for GBMSM engaging in chemsex are needed because the use of these drugs can have negative consequences for the physical and mental health of the people who use them. One of the main risks associated with chemsex is the possibility of overdose. In addition to the risk of overdose, chemsex can also increase the risk of sexually transmitted infections (STIs) and HIV transmission due to higher possibility to engage in risky sexual behaviors.

Taiwan's drug policy has gradually shifted from criminalization to medicalization, manifested by options for deferred prosecution or forced rehabilitation for drug users. Prosecutors may choose to order drug users to receive medical therapy such as psychotherapy and rehabilitation within one year after medical evaluation (Taiwan Chiayi District Prosecutors Office, 2020). However, being gay and using drugs create multiple layers of barriers for seeking help, making harm reduction approach equally important as clinical treatment or intervention that emphasized an abstinence approach. Harm reduction strategies recognize that drug use is a complex issue and that it is not always possible or desirable for people to stop using drugs completely. Instead, harm reduction approaches aim to reduce the harm that can result from drug use and to support people in making healthier choices.

In this study, ~~we examined the effectiveness of two types of harm reduction intervention strategy. One is in a physical setting that provides comprehensive chemsex care plan and HIV related services. The other is~~ we propose to develop an innovative mobile app that integrates harm reduction strategies onto the existing pre-exposure prophylaxis (PrEP) intake and adherence app. PrEP is a medication that can be taken daily to reduce the risk of HIV transmission. The aim of including PrEP adherence in the self-help harm reduction strategy is to ensure that participants have access to and are using an effective HIV prevention method. Behavior regulation strategies such as providing education about the risks of drug use, overdose prevention and management, and HIV prevention through correct PrEP intake, can be integrated on a mobile app that aims to minimize the negative consequences of drug use and reduce the risks associated with it, with an overarching goal to reduce the potentially negative consequences of problematic chemsex behavior for individuals and communities. Below is the specific study aim:

Aim: Determine the feasibility and usability of a harm-reduction mobile app on the reduction of HIV-, drug- and sex-related harms in a sample of cisgender men who have sex with men and transgender female who have sex with men who engage in chemsex.

B. SIGNIFICANCE

We are doing quite well in HIV prevention and treatment in Taiwan, but chemsex community is underserved.

Till August 2022, Taiwan has reported nearly 43,000 HIV infections (Taiwan Centers for Disease Control, 2022a), of which unsafe sexual transmission accounts for the highest transmission route and 83.8% of all cases were men who have sex with men (MSM) (Taiwan Centers for Disease Control, 2022b). HIV new infection declined significantly after 2017 in Taiwan due to the rapidly increased antiretroviral drugs (ART) treatment coverage (Lo et al., 2020), together with the successful implementation of HIV self-tests (Huang et al., 2022), and PrEP (Wu, Ku, Chang, et al., 2021). Despite the achievement in HIV prevention and treatment work in Taiwan, two major issues emerged in the recent decade as a new challenge for sexual health in the key population.

One is chemsex, sexualized drug use among gay, bisexual and other MSM (GBMSM) after the rise of social media and dating apps, and the other is the centralization of PrEP service delivery, which still limits the availability, affordability, and accessibility for some people, particularly people who live in areas with limited hospitals or clinics that prescribe PrEP.

Chemsex, a specific form of sexualized drug use, has a complex relationship with HIV.

Chemsex is a term to describe a culture of using certain drugs before or during sex among GBMSM that often involves methamphetamine, GHB/GBL and mephedrone (Strong et al., 2022). Motivations for chemsex include but not limit to having fun (67.1%), relaxation (66.9%), more intense sexual experience (63.1%), forget problems (45.1%), and increase sexual performance (44.9%) in a survey conducted by our team in year 2019, a cross-sectional, online, anonymous study that recruited GBMSM in Taiwan who had at least one experience of using drugs during sex in the preceding 12 months (Li et al., 2021).

Sexualized drug use is a tale as old as time and occurs across genders, cultures, ethnicities, and sexual orientations. Using substances, legal or illegal, to enhance sexual pleasure is a ubiquitous phenomenon and might have had minimal risk before HIV epidemic. Ever since the rise of HIV, various forms of sexualized drug use have been under speculation for being associated with risky sexual behavior, such as condomless sex, and in turn facilitates the transmission of HIV. A line of research since the 90s has been conducted to examine the effect of alcohol on heterosexual individuals on how the disinhibition effect of intoxication can defer their decision of using condoms during sex (Davis et al., 2007; George et al., 2009; George & Gilmore, 2013). That said, sexualized drug use is nothing new, but then why in a sudden, chemsex, a special form of sexualized drug use became a major concern in the HIV-prevention research and practice?

Chemsex in GBMSM is facilitated alongside the popularity of dating apps on mobile phones. Even though Taiwan compared to other Asian countries is a progressive and liberal country, the LGBTQ population still has been discriminated against by the majority. Meeting potential partners has been difficult before the development of mobile phones. Back then, because of discrimination, many needed to find potential partners in certain venues, such as saunas, bars, and parks. GBMSM's social spaces are now shifting to a more mobile, fluid, private direction, in that how individuals initiate and maintain intimacy and sociality also have also changed.

Further, dating apps on mobile phone not only changed the way people are meeting new partners, it also changed the accessibility and availability of some illegal substance. Access to methamphetamine

or GHB/GBL had become easier because it is not hard to find people who want to do chemsex and are looking for partners to do chemsex with on the dating apps.

The link between chemsex and HIV. There is quite a lot of public health literature talking about Chemsex and HIV, because a large proportion of men engaging in chemsex, and using drugs such as methamphetamine, are people living with HIV.

There are three possible mechanisms that can be speculated but not yet fully confirmed (Strong et al., 2022). First, it is possible to reason that chemsex facilitates HIV transmission. Chemsex has been reported to disinhibit or impair men's decision-making, a factor that contributes to a higher likelihood of anal intercourse without a condom or biomedical protection. The second plausible mechanism lies in individuals' risk-taking tendencies. Some GBMSM tend more likely to participate in the drug scene and be involved in condomless or biomedically unprotected sex. The third possible mechanism is that drugs may be used by GBMSM with diagnosed HIV to help alleviate the anxieties they feel about living with HIV.

Top harm reduction priority for chemsex individuals in Taiwan now should be PrEP uptake and adherence.

HIV prevention has progressed rapidly in the past decade. Strategies have evolved from “use condoms” only to a complex prevention package. The development of antiretroviral therapy (ART) and “prevention as treatment” have advanced HIV treatment and life expectancy (Maartens et al., 2014). The prophylactic effect of ART has made it possible for HIV prevention messages to include undetectable viral load for those whose partners are HIV-positive (May et al., 2014), post-exposure prophylaxis (PEP) following risky sexual exposure, needle stick or occupational exposure to infections (Benn et al., 2011), and most recently, PrEP, for high-risk individuals to prevent getting HIV infection (McCormack et al., 2016).

PrEP provides high-level protection against acquiring HIV. Effectiveness of PrEP has been well demonstrated both in heterosexual men and MSM in several clinical trials and open-label studies (Baeten et al., 2012; Choopanya et al., 2013; Grant et al., 2010; McCormack et al., 2016; Molina et al., 2015; Thigpen et al., 2012). In England's PROUD study, an open-label randomized trial in HIV-negative gay and other MSM who had anal intercourse without a condom in the previous three months to assess real-life effectiveness, found that the reduction in HIV incidence exceeded that reported from any placebo-controlled trial (McCormack et al., 2016). PrEP has thus been included as one of the major components of HIV prevention globally, such as in WHO guidelines (Organization, 2012, 2015), the United States (Saag et al., 2018), and the UK (McCormack et al., 2012). Most of the guidelines only recommended daily use for PrEP, meaning that by taking *tenofovir disoproxil fumarate/emtricitabine* (TDF/FTC) every day can prevent HIV infection. Daily PrEP use was recommended across gender and various subgroups, but event-driven PrEP was currently recommended only for MSM. The IPERGAY study in 2016 showed that event-driven PrEP in MSM was as efficacious as daily PrEP (Molina et al., 2015). Event-driven dosing regimen is now included in WHO guideline for not only GBMSM, but any male that is not under hormone therapy (World Health Organization, 2022).

The majority of PrEP users in Taiwan were GBMSM and nearly 90% of them preferred **event-driven** PrEP (Lee et al., 2017). One of the reasons why event-driven PrEP is so popular in Taiwan is the high cost of PrEP if individuals are not participants in the Taiwan CDC subsidy project. The cost of PrEP in Taiwan is similar to the UK, while the average GDP is much lower, making daily PrEP an unaffordable option for many people. This results in a major concern: the coverage of PrEP in Taiwan remains undesirably low and in real-world practice, users actually chose to use event-driven dosing regimen. According to PrEP watch, there are 4,142 persons on PrEP in Taiwan.

Compared to a country a similar population to Taiwan such as Australia (26.1 million for Australia and 23.9 for Taiwan), they have 51,898 individuals on PrEP (AVAC: Global Advocacy for HIV Prevention, 2022). PrEP adherence varied differently comparing daily and event-driven (ED) dosing regimen, with consistently much higher adherence in daily users compared to ED users across many countries (Vuylsteke et al., 2019), including Taiwan (Wu, Ku, Li, et al., 2021). This high preference and low adherence for ED dosing regimen in Taiwan is not only a concern for general GBMSM population, but it further poses a threat to harm reduction efforts for chemsex individuals.

C. RESEARCH DESIGN AND MATERIALS

SPECIFIC AIM: ~~Effectiveness study~~ Determine the feasibility and usability of a harm-reduction mobile app intervention strategy on the reduction of HIV-, drug- and sex- related harms in a sample of cisgender men who have sex with men and transgender female who have sex with men who engage in chemsex.

RATIONALE.

The increasing popularity of using PrEP to protect GBMSM from HIV infection is evident such as in the UK, New South Wales, Australia, and San Francisco, US (Buchbinder & Havlir, 2019; Grulich et al., 2021; O'Halloran et al., 2019). PrEP is considered an HIV-related harm reduction tool for chemsex individuals (Strong et al., 2022). The use of PrEP, methamphetamine, and erectile dysfunction drugs is also a common practice among GBMSM—the so-called “MTV generation”—who engage in chemsex (Hammoud et al., 2018).

A key concern has emerged regarding whether those engaging in chemsex maintain optimal PrEP adherence. Substance use may be a potential barrier for PrEP adherence just as it is for GBMSM living with HIV who are taking antiretroviral therapy (Hinkin et al., 2007; Marquez et al., 2009; Reback et al., 2003). **Speculations regarding why engaging in chemsex may impede PrEP adherence include losing track of days and then forgetting to take the medication as prescribed.** Both daily and event-driven dosing regimens for PrEP have been recommended for and adopted by men who have sex with men (Molina et al., 2022); this increases the complexity of PrEP adherence. Previous study in the U.S. has found that sexualized drug use in GBMSM was associated with missing a dose of PrEP on the same day and the next day, a so-called carryover effect, and recommended daily dosing regimen for sexualized drug users instead of event-driven dosing regimen (Grov et al., 2019). This is posed as a challenge in Taiwan considering many PrEP users used event-driven dosing regimen in real life.

How to self-manage daily, event-driven use of PrEP, or even switching between those two dosing regimens can be difficult for individuals engaging in chemsex. Biomedically speaking, although PrEP can reduce the harm of HIV infection, it is not clear whether chemsex participants follow the ideal PrEP regimen. Since 2016, PrEP has become a means to manage local HIV epidemic but little is known about the adherence to PrEP as a method of chemsex harm reduction. Driven by the rise of chemsex prevalence globally (Anato et al., 2021; Rivera et al., 2021) and a goal to scale up PrEP for HIV prevention, we aim to improve our understanding of the evolving chemsex practices, PrEP use, and adherence by GBMSM.

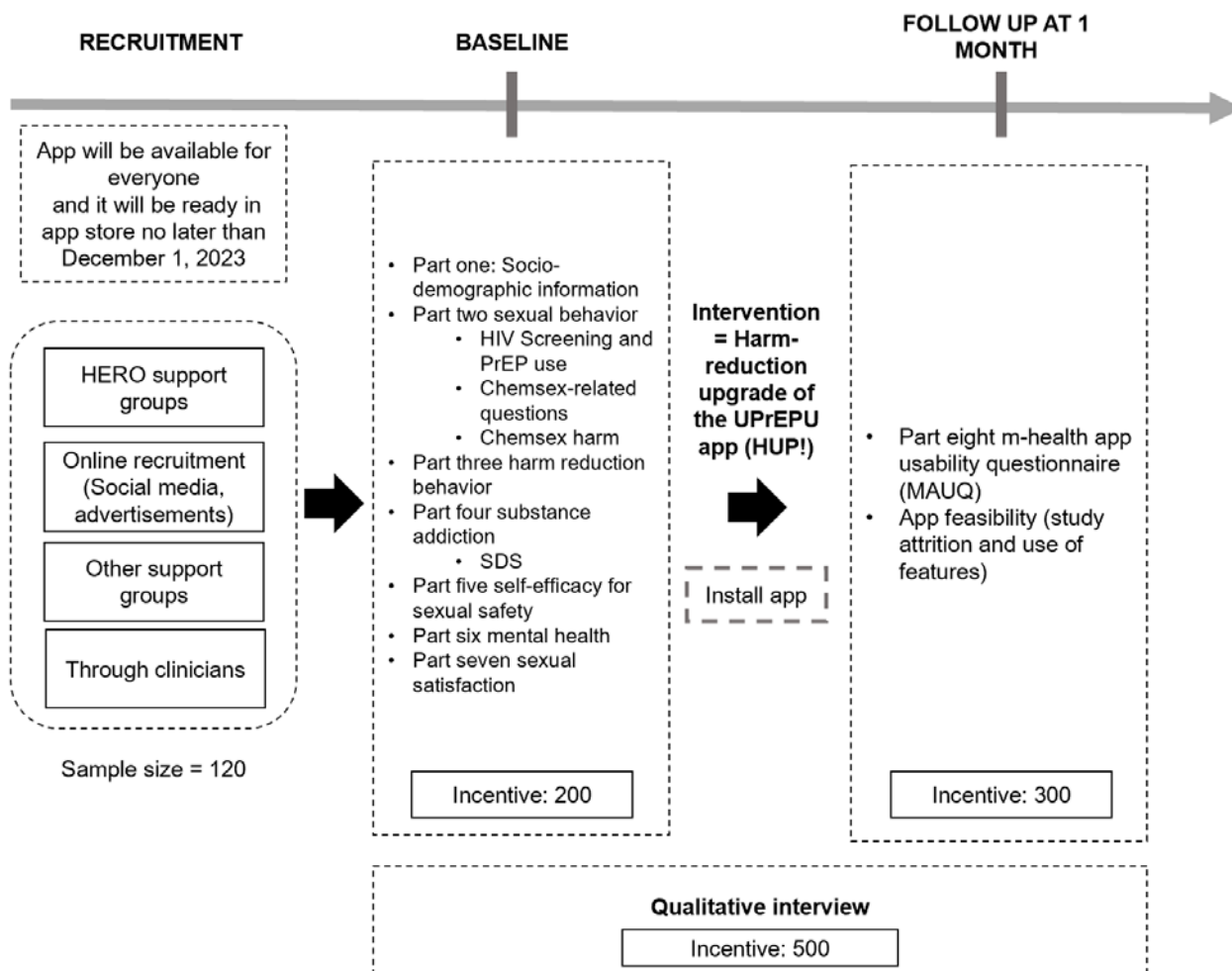
Effect evaluation outcomes include (1) Primary outcome: Did the intervention enhance harm reduction behaviors. Did the intervention increase self-efficacy for sexual safety. (2) Secondary outcomes: Did the intervention increase PrEP adherence; Did the intervention reduces chemsex-associated physical, social and mental harms, such as overdose, depression, suicidal thoughts; did the intervention reduces the frequency of risky sex behavior, including chemsex; did the intervention reduces substance use behavior; did the intervention enhance sexual satisfaction

THE INTERVENTION COMPONENTS

HUP! (Harm-reduction upgrade of the UPrEPU app). This harm-reduction upgrade will be integrated on the current existing UPrEPU app. Details of the development and potential features that will be added were explained in the Specific Aim.

STUDY DESIGN.

A single group interventional study design will be utilized to evaluate the effectiveness of a harm reduction app. We chose a single group interventional study design because pre-selection and randomization of groups are difficult and somewhat unethical in our setting, given a sensitive issue. We will use per protocol analysis to examine the study result.



Sample size estimate.

The study will utilize convenience sampling and will recruit an estimate of 120 participants.

PARTICIPANTS.

Eligibility Criteria:

To be eligible to participate in the effectiveness research, individuals must be: (1) above 18 years old, (2) cisgender men who have sex with men or transgender female who have sex with men, (3) individuals need to have a history of drug use (ecstasy, ketamine, crystal methamphetamine, mephedrone, and/or GHB/GBL) in a sexualized context in the previous year, (4) can read and understand Chinese; and (5) willing to communicate with the research group via the mobile messenger app, Line.

Recruitment Plan:

Participants will be recruited from HERO—an integrated care clinic for sexual health and chemsex in Kaohsiung, from current users of UPrEPu and through online recruitment and word of mouth.

MEASUREMENTS.

Online survey link will be provided for study participants to collect self-reported answers. For the feasibility and usability study, participants will answer the survey at the baseline and at 1 month follow up. ~~3rd month and 6th month follow-ups~~. They will be invited to also participate in the qualitative research that will be conducted within the study period. We will ask them about their chemsex recovery journey. We will introduce our app, and then use our app as a probe for chemsex journey, and see if they have any suggestions for the app. All surveys are anonymous. Their answers will be linked with an ID number generated by the combination of part of their Taiwan ID and birthday.

Outcome measure. Primary outcome will be the feasibility and usability of the app, which will be assessed at one month. Scores on the translated version of the mHealth App Usability questionnaire measured at the first month of follow up will be used to assess usability (Zhou et al., 2019). Feasibility is then measured by collecting data from app analytics one month after administering the baseline questionnaire.

Baseline measure.

Socio-demographic information will be collected at baseline. The proportion of harm reduction behaviors that participants have engaged in and their degree of self-efficacy for sexual safety will also be included.

PrEP adherence will be measured at the baseline. PrEP adherence is defined as taking PrEP correctly based on the dosing regimen and the occurrence of sex event (Wu, Ku, Chang, et al., 2021). At each visit, participants report their PrEP use within five days around the most recent anal sex in the past month. A correct intake of PrEP was defined separately by the dosing regimen which requires at least one pill a day within two days before and after sex for daily regimen, and two pills on the day of sex and followed by two doses in two days after sex for ED regimen (Wu, Ku, Chang, et al., 2021).

~~Secondary outcome also~~ We also include proportion of chemsex, sexual behavior, drug dependence measured by the Severity of Dependence Scale (SDS), mental health measured by the Patient Health Questionnaire-9 (PHQ-9), harms associated with chemsex, ~~feasibility and usability of the app~~, sexual satisfaction, HIV testing, goal changes, and undetectable viral load.

Analytic approach. Descriptive analysis will be used to report the feasibility and usability of the app.

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