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Trends and Patterns of Sexualised Drug Use among HIV-Positive Gay, Bisexual and Other Men Who Have Sex with Men: Insights from a Comprehensive Study in a Major European City - The U-SEX-2 GESIDA 9416 Study

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Trends and Patterns of Sexualised Drug Use among HIV-Positive Gay, Bisexual and Other Men Who Have Sex with Men: Insights from a Comprehensive Study in a Major European City - The U-SEX-2 GESIDA 9416 Study

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Abstract: Background: This study aimed to estimate the prevalence of sexualized drug use (SDU) in gay, bisexual, and other men who have sex with men living with HIV (HIV+GBMSM) in Madrid during 2019/2020 and compare it with data from 2016/2017. **Methods:** We analysed the frequency of SDU in a sample of HIV+GBMSM attending HIV clinics, who participated in an anonymous online survey regarding sexual behaviour and recreational drug use. The association between SDU, sexual risk behaviours, and STIs was evaluated. The methodology employed in the present study(U-SEX-2) in 2019/2020 was consistent with that of a previous study(U-SEX-1) in 2016/2017. **Results:** The study included 424 HIV+GBMSM, with a mean age of 40(10.43) years. Overall, 94% (396) reported being sexually active. Additionally, 33% (140) had been diagnosed with an STI within the previous year. Moreover, 54% (229) had used drugs in the last year, 25% (107) engaged

in SDU, and 15% (17) reported engagement in slamsex. After adjusting for confounding factors, SDU was associated with STIs, fisting, unprotected anal intercourse, and having > 24 sexual partners in the last year. According to the DUDIT test scores, 76% (81) probably had problematic drug use (≥6 points), and 5% (8) probable drug dependence (≥25 points). When comparing the U-SEX-1(2016/2017) data with the U-SEX-2(2019/2020) data, no significant differences were found in the proportion of participants practicing SDU or slamsex. **Conclusion:** The prevalence of SDU among HIV+GBMSM has remained high in recent years and without significant changes. We observed a clear association between SDU, high-risk sexual behaviors, STIs, and the risk of drug related problems.

Keywords: MSM; trends; high-risk sexual behaviors; HIV; sexualized drug use; chemsex; sexually transmitted infections

1. Introduction

Sexualized drug use (SDU), also known as *chemsex,* refers to the use of drugs to enhance sexual experiences [1]. Commonly used drugs in SDU include mephedrone and crystal methamphetamine, known for their arousal and stamina-enhancing effects, as well as γ-hydroxybutyrate (GHB)/γ-butyrolactone (GBL) and ketamine, which have disinhibiting properties. Injecting drugs in the context of SDU is referred to as slamsex [2].

SDU is relatively prevalent among gay, bisexual and other men who have sex with men (GBMSM) attending sexual health clinics [3], and appears to be more common among people living with human immunodeficiency virus (HIV) [4]. SDU has been linked to high-risk sexual practices such as unprotected anal intercourse (UAI) and engaging in sexual activities with multiple partners, which can lead to sexually transmitted infections (STIs), including those caused by blood-borne viruses such as HIV and hepatitis C [5].

SDU is a phenomenon strongly influenced by social networks and it has been observed in major cities worldwide for several years. In Spain, it is particularly prominent in Madrid and Barcelona [6]. The U-SEX-1 study conducted in Madrid in 2016 reported a prevalence of SDU among gay, bisexual, and other men who have sex with men living with HIV (HIV+GBMSM) of 29% [7].

Some studies from various geographic regions have investigated the extent of SDU among HIV+GBMSM [5,7]. These studies share a similar methodology, collecting data through self-completed surveys. Research has demonstrated that SDU has detrimental effects on the physical and psychological health of GBMSM, and due to its association with risky sexual behaviors and STIs, it poses significant public health concerns [8].

In response to these findings, institutions, and non-governmental organizations (NGOs) have implemented strategies for early detection, risk reduction, and harm reduction in HIV+ GBMSM. Awareness campaigns have been launched by NGOs, STI centers, and HIV clinics. Additionally, strategies for identifying problematic drug use and creating alternative support systems for individuals affected by SDU or slamsex have been established [9]. As SDU is a relatively new phenomenon, its evolution remains ongoing, necessitating vigilance to identify emerging behavioral patterns that may increase the risk of HIV transmission, other STIs, and severe mental health issues.

The present study aims to investigate the prevalence of SDU, patterns of drug consumption, sexual practices, and psychological distress symptoms in a sample of HIV+GBMSM. Furthermore, we compare our findings with data collected four years prior in the USEX-1 study to examine changes and trends over time.

2. Materials and Methods

The U-SEX-2 GESIDA 9416 study was conducted in 20 hospitals within the Madrid area over a planned duration of 6 months. Participants who met the inclusion criteria (GBMSM aged ≥18 years with documented HIV infection) were invited to participate in the study by Infectious Diseases Specialists at the HIV clinics of each participating hospital. The methodology employed in the U-SEX-

2 study (2019/2020) was consistent with that of the U-SEX-1 study (2016/2017), which was conducted four years earlier and published in two articles [7,10].

The purpose of the study was explained to the patients by physicians, who then extended an invitation to participate. Patients were provided with a unique code and a link to an online survey via a non-transferable card. Information about the study was printed on the back of the card. The survey was self-completed by the participants. To assess response rates and sample representativeness, physicians entered a series of data into a local database, including the participant's code, age, level of education, nationality, and previous or current drug use (Table 1) This study adheres to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

The online survey evaluated various domains, including general sociodemographic data, HIV infection status, sexual risk practices, STI diagnosis, psychiatric disorders, and history of drug use. If participants reported any form of drug use, they were directed to a second part of the survey, which evaluated the types of drugs used, the context in which they were used, frequency, route of administration, and other SDU related variables. The U-SEX-2 study (2019/2020) utilized the same variables and definitions as the U-SEX-1 study (2016/2017) [7].

SDU was defined as the intentional use of mephedrone or similar cathinones, 3,4-methylenedioxy-N-methylamphetamine (MDMA), methamphetamine, amphetamines, GHB/GBL, ketamine, or cocaine during sexual activity within the previous year. Psychological distress was measured using the Hospital Anxiety and Depression Scale (HADS), a 14-item scale with two 7-item subscales assessing anxious and depressive symptoms. A score above 8 on the subscales indicated significant symptoms of depression or anxiety [11,12]. The Drug Use Disorders Identification Test (DUDIT), an 11-item self-administered screening instrument, was also employed. It provided information on the level of drug intake and selected criteria for substance abuse/harmful use and dependence based on the ICD-10 and DSM-4 diagnostic systems [13]. DUDIT scores ≥6 suggested probable drug related problems, while scores ≥25 indicated probable drug dependence. The authorized Spanish version of the DUDIT was used only for participants who had used drugs in the last year. Study data were collected and managed using Research Electronic Data Capture (REDCap) at "Asociación Ideas for Health," a Spanish non-profit organization focused on research and medical education [14].

The study was conducted in accordance with the Declaration of Helsinki, and the survey was voluntary and anonymous, eliminating the need for written informed consent. The Institutional Review Board and the Research Ethics Committee of Hospital General Universitario Gregorio Marañón approved the study (HUIL 1606-13/2019).

All analyses were performed using IBM SPSS v.24 (IBM Corp, Armonk, NY, USA). Two-tailed p-values were reported, with a significance level of $P<0.05$. First, to detect potential nonresponse bias, we collected sociodemographic and clinical variables of the people who did not respond to the survey. There were no major differences between those who responded and those who did not in terms of age, foreign origin, having university studies or illicit drug consumption (Table 1).

Table 1. Differences between patients who responded to the questionnaire and those who didn't.

	Did Not Respond to the Questionnaire (588)	Responded to the Questionnaire (412)	P value
Age, median (IQR)	39 (33-47)	39 (33-47)	0.655
Foreigner, n (%)	217 (37.0%)	153 (37.4%)	0.903
University studies, n (%)	287 (49.4%)	226 (55.4%)	0.063
Had ever used drugs, n (%)	382 (69%)	299 (72%)	0.052

Abbreviations: IQR: interquartile range.

The sample was described using absolute and relative frequencies for categorical variables and mean and standard deviation (SD) for continuous variables. The chi-square test and independent

samples t-test were employed in the univariate analysis to compare baseline characteristics between participants engaged and non-engaged in SDU. Multiple logistic regression analyses were conducted, with SDU as the dependent variable, to explore the association between SDU and variables related to baseline characteristics, high-risk sexual behaviors, and STIs. Independent variables were included if they showed a significant association with the dependent variable in the univariate analysis (P<0.05). Age was included as a continuous variable in the regression analysis due to its influence on patterns of drug consumption. To assess trends in the prevalence of SDU and evaluate differences between the U-SEX-1 study (2016/2017) and the U-SEX-2 study (2019/2020), a comparative analysis was conducted using the study year as the independent variable. It is important to note that both studies collected the same variables and employed identical definition.

3. Results

The U-SEX-2 GESIDA 9416 study commenced in October 2019 and was prematurely halted due to the coronavirus disease (COVID-19) pandemic in February 2020.

3.1. Participant characteristics

A total of 424 HIV+ GBMSM were included in the present analysis. The mean age was 40 years (SD=10.43). Participants were predominantly Spanish born (61%), with 33% born in South and Central America. Over half (55%) had completed university studies. Overall, 63% had monthly incomes exceeding 1000 euros, and 71% were employed, whereas 13% were unemployed. The mean time since HIV diagnosis was 8.9 years (SD=7.03), with 419 (99%) participants on antiretroviral therapy (ART). Of these, 96% reported an adherence rate of >90% to ART.

Approximately half of the sample (46%) reported having a stable partner, with 33% of these partners being HIV-positive. Overall, 396 (93%) reported being sexually active. Of these, 63% reported unprotected sex in non-partnered relationships, with 21% never using condom. Regarding high-risk sexual behaviors, in the previous year, 187 (44%) had had more than 24 sexual partners, 68 (16%) had practiced fisting, and 21 (5%) had engaged in transactional sex. Furthermore, 30% reported having had threesome sex, and 21% group sex (with 17% involving >6 individuals) (Table 2)

Table 2. Characteristics of the Patients Included in the Analysis Stratified by Sexualized Drug Use.

	Total (n=424)	No SDU (n=317)	SDU (n=107)	P value
Age, M (SD)	40(10.43)	40.53 (11.10)	38.42 (7.99)	0.034
Spanish-born, n (%)	259 (61.5)	183 (58)	76 (72)	0.013
University studies, n (%)	232 (55.2)	169 (54)	63 (59)	0.315
Salary >1000 euros/m, n (%)	266 (63.3)	189 (60)	77 (73)	0.021
Years since HIV diagnosis, M (SD)	8.88(7.03)	9.22(7.39)	7.89(5.80)	0.059
On ART, n (%)	419 (99.3)	312 (98.4)	107 (100)	0.311
Complete adherence (>95%) to ART, n (%)	394(96%)	299(96)	100 (94%)	0.431
Stable partner, n (%)	194 (46)	155 (49)	39 (37)	0.030
Depression, n (%)	64 (15)	46 (14)	18 (17)	0.564
Anxiety, n (%)	63 (15)	42(13)	21(20)	0.109
Substance abuse, n (%)	26 (6)	8 (2)	18(17)	<0.001
Self-reported HIV-related distress, M (SD)	33.51(31.08)	36.14(31.60)	25.74 (28.23)	0.005
Anxiety symptomatology, M (SD)	6.00 (4.07)	5.91 (4.05)	6.25 (4.12)	0.466
Depression symptomatology, M (SD)	3.56(3.70)	23.57(3.62)	3.55 (3.94)	0.972
Sexually active in the last year, n (%)	396 (93.6)	289 (91.5)	107 (100)	0.002
≥ 24 sexual partners, n (%)	187 (44.1)	114 (36)	73 (68.2)	<0.001
Unprotected anal intercourse, n (%) ¥	272(69)	172 (60)	100 (93)	<0.001
Male prostitution, n (%)	21 (5)	13 (4)	8 (7)	0.250
Fisting, n (%)	68 (17.3)	21 (7.3)	47 (44.3)	<0.001
Any STI, n (%) ε	313 (73.8)	212 (66.9)	101 (94.4)	<0.001
Any STI in the previous year, n (%) ε	140 (33)	72 (22.7)	68 (63.6)	<0.001

Syphilis, n (%) ε	89 (21)	40 (12.6)	49 (45.8)	<0.001
Gonorrhea, n (%) ε	44 (10.4)	23 (7.3)	21 (19.6)	<0.001
Chlamydia, n (%) ε	37 (8.7)	18 (5.7)	19 (17.8)	<0.001
Hepatitis C, n (%) ε	7 (1.7)	1 (0.3)	6 (5.6)	<0.001
Urethritis, n (%) ε	24 (5.7)	9 (2.8)	15 (14)	<0.001
Proctitis, n (%) ε	17 (4)	10 (3.2)	7 (6.5)	0.122
Active smoker, n (%)	148 (35.2)	92 (29.3)	56 (52.8)	0.001
Regular drinker (≥3 times/week), n (%)	55 (13)	36 (11.4)	19 (17.8)	0.088

Notes: *, Self-referred current diagnosis; ¥, with casual partners; ε, Self-referred diagnosis. **Statistical analysis:** Differences were evaluated using the chi-square test or Fisher's exact test for categorical variables and with a T-test for independent samples for quantitative variables. **Abbreviations:** M, mean; SDU, sexualized drugs use; IQR, interquartile range; ART, antiretroviral therapy; HIV, human immunodeficiency virus; SD, standard deviation; STI, sexually transmitted infections.

Overall, 313 (74%) participants had been diagnosed with an STI at any time, and 140 (33%) had received such a diagnosis in the preceding year. Of these recent diagnoses, 64% were syphilis, 26% chlamydia, 31% gonorrhea, 3% hepatitis A, and 5% hepatitis C. Most participants (61%) disclosed their HIV diagnosis to their sexual partners and underwent contact tracing (Table 2). In total, 229 (54%) participants reported using drugs in the previous year.

3.2. Sexualized drug use (SDU): drug consumption and psychological distress symptoms

By the criteria defined in the methods section, 25% of participants (n=107) had engaged in SDU in the previous year. The most frequent drugs used during sex were: mephedrone (n=71, 66%), GHB (n=71, 66%), cocaine (n=44, 41%), crystal methamphetamine (n=36, 34%), ketamine (n=29, 27%) and MDMA (n=27, 25%). Notably, 55.1% (n=59) reported combining different drugs within a sexual context, with 27 (61%) of these regularly combining 3 or more drugs per session (polydrug use). Seventeen participants (17%) reported slamsex, and 23 (21%) used drugs rectally, with mephedrone and other cathinones being the primary drugs used in rectal administration (n=18, 78%). In addition to these substances, participants engaged in SDU reported having used erectile dysfunction drugs (76.6%), nitrites (86.9%), sedatives, relaxants, or hypnotics (41.1%), protein supplements (36.4%), and anabolic steroids (8.4%) in the past year.

Regarding the location of SDU sessions, 98.1% reported practicing SDU in private homes, 43% in saunas or sex bars, 20.6% in nightclubs, and 7.5% in cruising areas. SDU sessions lasted over 12 hours in 24.2% of the cases. More than 90% of the SDU-practicing participants used apps or websites to find sexual partners. Of these, 53.2% used social networks exclusively to find sexual partners for SDU.

Out of the 101 participants engaged in SDU who completed the valid DUDIT-test, 81 (80%) scored ≥ 6 points, suggesting probable drug related problems, with 8 (10%) indicating probable drug dependence (DUDIT score >25). In terms of mental health, 18 participants engaged in SDU (17%) reported a diagnosis of depression, with 61% of these receiving pharmacological treatment. Moreover, 21 (20%) reported having been diagnosed with an anxiety disorder, 56% of whom were currently receiving pharmacological treatment. Three participants (2.8%) reported a diagnosis of a psychotic disorder, and another three (2.8%) a personality disorder. Finally, scores in the HADS questionnaire suggest that 37.4% (n=40) had significant anxiety symptoms and 17.8% (n=19) significant depressive symptoms.

3.3. Factors associated to SDU

Compared to participants who were not engaged in SDU, those engaged were more likely Spanish-born, earn salaries greater than 1000 €/month, had incomplete adherence to ART, and were active smokers. The proportions of these characteristics were significantly higher among participants engaged in SDU. Participants engaged in SDU also had higher proportions of risk behaviors and higher rates of STI (Table 2 and Table 3).

Table 3. Characterization of drug use in the overall population and in the population stratified By Sexualized Drug Use.

Drug use in the last year	Total (n=424)	No SDU (n=317)	SDU (n=107)	P value
Active smoker, n (%)	148 (35.2)	92 (29.3)	56 (52.8)	0.001
Regular drinker (≥3 times/week), n (%)	55 (13)	36 (11.4)	19 (17.8)	0.088
Ever used drugs, n (%)	306 (72.2)	199 (62.8)	107 (100)	<0.001
Used drugs in the last year, n (%)	241 (56.8)	134 (42)	107 (100)	<0.001
Cannabis, n (%)	130 (46.4)	70 (39.3)	60 (58.8)	0.002
Nitrites, n (%)	183 (65.6)	90 (51.1)	93 (90.3)	<0.001
Cocaine, n (%)	101 (36.2)	31 (17)	70 (72.2)	<0.001
GHB/GLH, n (%)	89 (33.7)	11 (6.8)	78 (75.7)	<0.001
Mephedrone, n (%)	85 (32.3)	9 (5.6)	76 (74.5)	<0.001
MDMA, n (%)	83 (31.3)	29 (17.1)	54 (56.8)	<0.001
Crystal Meth, n (%)	45 (17.9)	5 (3.1)	40 (43.5)	<0.001
Ketamine, n (%)	53 (20.5)	13 (8)	40 (42.1)	<0.001
Slamsex, n (%)	19 (4.5)	2 (0.6)	17 (15.6)	<0.001
Combination ≥ 3 drugs, n (%)	27 (6.4)	0 (0)	27 (25.2)	<0.001
Used Apps for sex and drugs, n (%)	214 (70.6)	116 (59.2)	98 (91.6)	<0.001
Intrarectal drug use, n (%)	23 (5)	0 (0)	23 (21)	<0.001
Risky drug use (DUDIT≥6points), n (%)	122 (54.7)	41 (33.6)	81 (80.2)	<0.001
Drug dependence (DUDIT≥25points), n (%)	8 (3.6)	3 (2.5)	5 (5)	0.473
Sedatives/tranquilizers, n (%)	109 (25.8)	65 (20.6)	44 (41.4)	<0.001
Erectile dysfunction drugs, n (%)	145 (34.4)	63 (20)	82 (76.6)	<0.001

Statistical analysis: Differences were evaluated using the chi-square test or Fisher's exact test for categorical variables. **Abbreviations:** SDU, sexualized drugs use; GHB/GLH, γ-hydroxybutyrate/γ-butyrolactone; MDMA, 3,4-methylenedioxy-N-methylamphetamine; Crystal Meth, crystal methamphetamine; Slamsex, intravenous SDU; HIV, human immunodeficiency virus; STI, sexually transmitted infections; DUDIT, Drug Use Disorders Identification Test.

In the multivariate analysis, factors independently associated with SDU were having been diagnosed with a STI in the last year, aOR 3 (1.7-5.4), P<0.001; having practiced fisting, aOR 6.1 (3.0-12.1), P<0.001; unprotected anal intercourse, aOR 4.8 (1.9-12), P=0.001; and having more than 24 sexual partners in the last year, aOR 2.1 (1.2-3.8), P=0.008.

3.4. Trends in SDU over the time

We compared the U-SEX-1 Study (2016/2017) and the U-SEX-2 Study conducted in 2019-2020. There were no notable differences observed between the two studies in terms of the prevalence of SDU (29% vs. 25%) and slamsex (4.6% vs 4.5%). However, there were certain differences in the second survey compared to the first. The U-SEX-2 study reported a higher percentage of foreign participants (26% vs 38%), an increased proportion in participants on ART (96% vs. 99%), and a greater number of individuals engaged in risky sexual behavior and STIs (Table 4). As for substance use, no significant differences were found between the two studies, except for cocaine that showed a decline between 2016 and 2020 (46% vs 36%).

Table 4. Comparison of the U-SEX-1 study (2016/2017) and the U-SEX-2 study (2019-2020).

Characteristics	2016/2017 Usex-1	2019/2020 Usex-2	P-value
Age, median (IQR)	38 (32-45)	40 (33-47)	0.328
Spanish-born, n (%)	545 (73.9%)	259 (61.5%)	**<0.001**
University level studies, n (%)	438 (59.5%)	232 (55.2%)	0.157
Salary >1000 euros/month, n (%)	478 (65.7%)	266 (63.3%)	0.409
Years from HIV diagnosis, median (IQR)	5 (2-10)	7(3-12)	**<0.001**
On ART, n (%)	677 (95.8%)	419 (99.3%)	**0.001**

Complete adherence to ART, n (%)	524 (78.3%)	306 (73.4%)	0.078
Stable partner, n (%)	363 (49.3%)	194 (45.9%)	0.266
Risk behaviours			
≥ 24 sexual partners, n (%)	126 (18.6%)	187 (44.1%)	**<0.001**
Unprotected anal intercourse, n (%)	415 (55.9%)	272 (69.2%)	**<0.001**
Any STI, n (%)	465 (62.7%)	313 (73.8%)	**<0.001**
Fisting, n (%)	125 (16.8%)	68 (17.3%)	0.860
Sexual worker	21 (3.9%)	21 (5.3%)	0.304
Used Apps for sex and drugs	307 (83.4%)	214 (70.6%)	**<0.001**
Use of drugs			
Ever used drugs, n (%)	518 (69.8%)	306 (72.2%)	0.395
Combination ≥ 3 drugs, n (%)	98 (13.2%)	27 (6.4%)	**<0.001**
Chemsex, n (%)	216 (29.1%)	107 (25.2%)	0.155
Slamsex, n (%)	34 (4.6%)	19 (4.5%)	0.936
Drugs used in the last year			
Cannabis	220 (46.0%)	130 (46.4%)	0.914
Nitrites	314 (63.8%)	183 (65.6%)	0.622
GHB	168 (36.7%)	89 (33.7%)	0.422
Cocaine	225 (46.4%)	101 (36.2%)	**0.006**
Mephedrone	162 (34.8%)	85 (32.3%)	0.503
MDMA	138 (30.4%)	83 (31.3%)	0.796
Cristal Meth	67 (15.1%)	45 (17.9%)	0.330
Ketamine	89 (20.1%)	53 (20.5%)	0.886

Statistical analysis: Differences were evaluated using the chi-square test or Fisher's exact test for categorical variables and with a Kruskal Wallis-U test for quantitative variables. **Abbreviations**: HIV, human immunodeficiency virus; ART, antiretroviral therapy; STI, sexually transmitted infections; GHB, ϒ hydroxybutyrate; MDMA, 3,4-methylenedioxy-N-methylamphetamine ; Cristal Meth, crystal methamphetamine

4. Discussion

In the present study, we replicated the cross-sectional U-SEX-1 Study [7], conducted in 2016-2017, to examine changes in prevalence and patterns of drug use or sexual practices among HIV+ GBMSM engaged in SDU in Madrid, Spain. It is essential to monitor these changing patterns to enable sexual health services to plan for the increasingly complex needs of a high proportion of individuals. Utilizing the same methodology in the same HIV Clinics, we estimated changes in the trend of SDU practice among this population. Unfortunately, the study had to be halted prematurely in February 2020 due to the COVID-19 pandemic, a decision made by the scientific coordinators considering the likely impact of the pandemic on the study's objectives.

Participant characteristics in this study closely resembled those described in the U-SEX-1 study. As in the U-SEX-1 study, U-SEX-2 participants engaged in SDU were more likely to partake in high-risk sexual behaviors and were more frequently diagnosed with an STI than those not engaging in SDU. The use of different drugs remained constant over the years, except for cocaine, which seems to have decreased over time. Moreover, the practice of SDU appeared to sustain after four years in HIV+ GBMSM in Madrid (29% vs 25%). The consistent prevalence suggests that existing strategies might be effective, given we have not registered a significant increase in cases. However, new preventive actions should be conducted to reduce these rates. Our data underscores the need to continue developing specific and multidisciplinary interventions for individuals practicing SDU to prevent drug-related problems, STIs, and other mental health problems.

A limited number of studies have explored the progression of SDU over time. One such study from Australia examined illicit and licit drug use among gay and bisexual men [15]. It found over half had used illicit drugs in the past six months, with a significant proportion using party drugs. Recent updates revealed an increase in concurrent use of specific drugs. However, unlike our study,

this research didn't specifically track SDU prevalence and was conducted online rather than in a clinical setting.

The AURAH2 was a longitudinal study conducted in London and Brighton, focusing on HIV-negative or undiagnosed GBMSM. It examined changes in SDU or chemsex and associated drug use over a three-year period (2015-2018) [16]. Despite indicating a decline in chemsex prevalence (from 32% to 11.1%) and the use of chemsex-specific drugs (mephedrone declined from 25.2% to 9.7% and GHB/GBL use had also declined from 19.9% to 8.3%) these results diverge from our study's findings, as we have found a slight but not significant decrease in the prevalence of SDU. Our research, centered on HIV+ GBMSM, didn't reveal any significant shifts in drug use patterns or prevalence, possibly highlighting differing contexts between HIV-positive and HIV-negative populations. Differences may also be due to different trend changes in different countries or the change to other drugs consumed in the sexual context since the AURAH2 study only includes a limited number of drugs associated with chemsex in its definition.

Another significant prospective study, conducted in a cohort of GBMSM attending sexual health clinics in England, reported recreational drug use as one of the strongest factors associated with HIV incidence. Similarly, to our data, these authors reported that the prevalence of slamsex remained relatively stable, between 2013 and 2018 [17].

Our research identified a relatively high prevalence of SDU and STIs in the HIV+ population, along with significant symptoms of depression, anxiety, and drug-related problems. These findings underscore the complexity and intersectionality of symptoms and behaviors in this population, necessitating a comprehensive, multidisciplinary approach to treatment [8,10,18,19].

In our opinion, these results highlight the intersectionality of different symptoms and behaviors in this population, and the need for a multidisciplinary and multi-resource approach as the predominant mode of treatment. Thus, HIV units and sexual health clinics should provide comprehensive assessment and care, including STI and drug use prevention, being directly coordinated with the specific drug and mental health services. Further exploring the factors that originate and maintain these problematic practices is also essential to identify vulnerable HIV+ GBMSM and implement preventive strategies. Correct management of this syndemic, coupled with promoting self-care, could improve these individuals' health perception and their overall quality of life [20,21].

Traditionally, effective prevention measures such as education, behavioral counseling, condom promotion, and reduction of risky sexual behaviors have been used. However, new prevention strategies are needed to address the needs of specific populations at higher risk of STIs and to demonstrate effective interventions in specific populations at higher risk of STIs, drug related and mental health problems [22]. In our view, traditionally effective measures to prevent STIs, drug use, and mental health problems among HIV+ GBMSM who use drugs, should be combined to develop multidisciplinary programs. These programs should be implemented in sexual health clinics, HIV units, NGOs, and other community services and drug and mental health services. Furthermore, all these services should continue to adapt, with their professionals receiving specific training to successfully attend to this population. Given that this is a public health problem, local and public health institutions have launched information and awareness campaigns and allocated resources for the care of people with problematic consumption in this context [9]. In Madrid, initiatives have been launched by the public health service of the Health Council. An advisory group has been formed consisting of NGOs, healthcare providers, personnel from STI or HIV clinics and addiction centers. The goal is to implement a series of measures to educate the target population and work in an interdisciplinary manner.

Our study has certain limitations inherent to cross-sectional survey studies, especially response bias. Although we used limited time periods in questions that depended on memory, recall bias could distort the accuracy of the results. An additional limitation is that the study comprises a comparison and description of two cross-sectional surveys. These types of studies cannot explain causality and are affected by antecedent-consequent bias. Nonetheless, descriptive/analytical cross-sectional

studies are useful for establishing preliminary evidence for a causal relationship, and furthermore, longitudinal monitoring could help identify trends.

Our study has several strengths. Firstly, we report, for the first time, data on the prevalence of SDU over time in GBMSM living with HIV in Spain. This could allow our findings to be used to infer about the potential effectiveness of the interventions that have been developed for this population in our country. Our research also benefits from a well-defined and large sample size. This was made possible by the eligibility criteria being applied by the patients' own physicians, who were able to collect baseline information and distribute the survey directly.

The high prevalence of high-risk sexual behaviors and STIs among individuals engaged in SUD, reported in multiple studies as well as the increase noted in the present analysis, warrants attention [3,5,23–25]. From a public health perspective, the rise in high-risk sexual behaviors in this population should serve as an alarm bell for healthcare institutions and policymakers. Creating working groups to establish and agree on the most appropriate strategies for prevention, risk reduction, and harm reduction in the population practicing SDU should be a priority. Additionally, funding community projects linked to SDU through grants is critical to tackle this public health problem. Increasing awareness among individuals practicing SDU through preventive measures is a task for public health and all professionals caring for HIV+ GBMSM patients.

5. Conclusions

Our study demonstrated that sexualized drug use (SDU) remains prevalent among HIV+ GBMSM in Spain. However, over time, the pattern and prevalence of SDU has remained largely unchanged. These findings underscore the necessity for continued, targeted interventions addressing SDU, sexual health, mental health, and substance use within this population. The lack of significant change in SDU patterns suggests that current strategies may need to be reevaluated or augmented to effectively decrease SDU prevalence and associated harms.

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