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1 **Attachment and mental health of men having sex with men engaging in**
2 **chemsex: is substance abuse only the tip of the iceberg?**

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26

27 **Abstract**

28 Gay and bisexual men and other men who have sex with men (GBMSM) with problematic
29 chemsex (a specific sexualized drug use pattern) face several health issues. The aim of this
30 monocentric observational study was to assess mental health history and attachment style (AS)
31 within 71 GBMSM seeking care for problematic chemsex. Attachment style (AS) was evaluated
32 using the Relationship Scales Questionnaire. 82% of the cohort (58) had at least one mental health
33 disorder (among depression, anxiety, alcohol use disorder or hypersexuality). 9.9% were admitted
34 to intensive care due to chemsex use. Traumas were frequent, with 31% reporting childhood sex
35 abuse and 24% declaring having attempted suicide. 62 (87%) had insecure AS: 38% preoccupied,
36 23% fearful and 24% dismissing. Users with a positive self model (N=24) had fewer comorbidities
37 (63% vs 92%, $p=0.003$) and practiced more chemsex alone (75% vs 33%, $p<0.001$) than users
38 with negative self model (N=47) . Users with a positive other model (N=35) practiced more
39 slamsex (injections of substance in a sexual context) (80% vs 50%, $p=0.008$) and had fewer
40 comorbidities (71% vs 92%, $p=0.027$) than users with negative other model (N=36). Attachment
41 theory is a way to provide holistic and tailored and harm reduction.

42

43 **Key Words:** chemsex, men who have sex with men, mental health, addiction, attachment

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47 **Introduction**

48 Chemsex (contraction of “chemical sex”) is commonly understood as the use of specific drugs,
49 specifically for sex, to reduce inhibition and enhance sexual pleasure, by gay and other men who
50 have sex with men (GBMSM) (Amundsen et al., 2023; Sewell et al., 2019; Stuart, 2019). Specifics
51 substances used are cathinone, methamphetamine, mephedrone, γ -hydroxybutyric acid/ γ -
52 butyrolactone (GHB/GBL), cocaine and ketamine (Batisse et al., 2016; Nimbi et al., 2020). In 75%
53 of chemsex acts, some combination of these drugs is used (Batisse et al., 2016; Schreck et al.,
54 2020). “*Slamming*” or “*slamsex*” defines substance injections in a sexual context (Blomquist et al.,
55 2020; Bourne et al., 2015). Few studies evaluate the prevalence of chemsex use outside a clinical
56 population. Of a sample of 30294 GBMSM in the United States, 10% reported chemsex drug use
57 in the past 12 months (Ivey et al., 2023). Edmundson *et al.* report in a literature review in the
58 United Kingdom that 17% of GBMSM attending sexual health clinics and 31% of HIV-positive
59 GBMSM inpatients practice chemsex (Edmundson et al., 2018). Of 1589 HIV-positive GBMSM
60 in the Chems4EU study, which covered GBMSM from four European countries, 24.0% reported
61 practicing chemsex and 6.5% reported practicing slamsex in the previous 12 months (Whitlock et
62 al., 2021). Motivations for engagement in chemsex include emotional connection, bodily
63 sensations, disinhibition, and desire. Substances induce an increase in libido, confidence,
64 disinhibition, and stamina (Diestelmann et al., 2018; Moyle et al., 2020). Clinical experience and
65 gender studies report that for some GBMSM, chemsex causes an experience of sense of
66 collectivity and therefore the rise of chemsex can be linked to an embodied response to material
67 conditions shaped by neoliberalism and feelings of loneliness (Hakim, 2019). Tan et al. described
68 how some GBMSM used chemsex as a coping mechanism to deal with emotional and situational
69 triggers, such as HIV-related stigma, racism, sexual violence, death and loss, neglect, and
70 internalized homophobia (Tan et al., 2021).

71 Chemsex is associated with severe hazards for health. Cardiac toxicity, bladder or
72 thermoregulation dysfunction are frequently described (Donnadieu-Rigole et al., 2020). Misuse of

73 GHB can result in severe overdose with unconsciousness among 25% of users or even death
74 (Mason & Kerns, 2002; Weatherburn et al., 2017). Chemsex is associated with a high risk of
75 sexually transmitted infections (STI) such as HIV, hepatitis C, hepatitis B, syphilis, both because
76 of drug use patterns and associated sexual behaviors (such as unprotected anal intercourse or group
77 sex) (Rana et al., 2019). Slamsex brings additional risks of HIV and Hepatitis C infection if needles
78 or other injecting equipment are shared. Acute psychiatric consequences are frequent: panic
79 attacks, psychotic symptoms, suicidal thoughts, severe agitation requiring hospitalization (Batisse
80 et al., 2016; Diestelmann et al., 2018; McKetin et al., 2013). Not all GBMSM who engage in
81 chemsex experience psychiatric symptoms; however, a relationship between drug use and mental
82 health may exist in various studies. Íncera-Fernández et al. showed in a systematic review that
83 75% of the studies analyzed indicated a relationship between chemsex and negative mental health
84 outcomes, 50% found a positive association between chemsex and depression symptoms, 33%
85 between chemsex and anxiety symptoms and 25% between practicing chemsex and suicidal
86 ideation (Íncera-Fernández et al., 2021). Dual diagnosis, as the co-occurrence of a substance use
87 disorder (SUD) and a psychiatric disorder, is frequent with GBMSM who report problematic
88 chemsex. Psychiatric comorbidities are therefore common: depression (up to 50% of chemsex
89 users, 9.6% report a suicide attempt in their lifetime (Bohn et al., 2020; Hampel et al., 2020)),
90 anxiety disorder (Prestage et al., 2018), alcohol use disorder (AUD) (up to 16% are high-risk
91 drinkers (Lea et al., 2015)) and opioid use disorder (Paschen-Wolff et al., 2022). The role of
92 hypersexuality is unclear (Malandain, Blanc, Ferreri, & Thibaut, 2020; Miner et al., 2016). Prior
93 mental health vulnerabilities of problematic chemsex users have been less studied to date (Bohn
94 et al., 2020; Íncera-Fernández et al., 2021). It would be crucial to determine if the mental health
95 outcomes are present before engaging in chemsex, and which factors are related to its genesis and
96 maintenance. Sexual minorities (people with a homosexual or bisexual sexual orientation)
97 experience worse mental health outcomes compared to the heterosexual population (Burton et al.,
98 2013). This has been associated with formal factors (such as legal sanctions) or informal factors

99 (such as victimization). Young people experiencing victimization report higher levels of
100 depression, suicidal ideation, suicide attempts, substance use, and absenteeism (Poteat et al., 2011;
101 Russell & Fish, 2016). Minority stress theory (Meyer, 2003) provides a framework for
102 understanding psychological outcomes among sexual minorities. This theory states that sexual
103 minorities are chronically exposed to different stressors such as harassment and victimization,
104 rejection expectations, escape and hiding, prejudices, and the risk of suffering violence simply
105 because they are a sexual minority (Katz-Wise & Hyde, 2012; McConnell et al., 2018). These
106 pressures could affect the mental health and wellbeing of GBMSM and could be exacerbated by
107 reduced social support (Sattler et al., 2017). Potential mental health symptoms among people who
108 use drugs for sexual purposes could be associated with increased vulnerability to sexually
109 transmitted infections (STIs) and a possible reduction in the effectiveness of prevention efforts
110 prior to HIV infections (Sun et al., 2020). Mental health symptoms among GBMSM with
111 problematic chemsex use may therefore be due to several reasons, including prejudice,
112 discrimination, and social stigma as a source of long-term stress (Hylton et al., 2017; Mays &
113 Cochran, 2001; Meyer, 2003; Teasdale & Bradley-Engen, 2010). Interpersonal relationships play
114 a key role in chemsex engagement (Sousa et al., 2020; Strathearn et al., 2019), and could have
115 been altered since the advent of dating apps, used by most chemsex users looking for partners
116 (Choi et al., 2020; Grov et al., 2014). The influence of attachment in the mechanism of addiction
117 is well described (Hiebler-Ragger & Unterrainer, 2019; Strathearn et al., 2019). Attachment
118 theory, initially proposed by Bowlby (1969), posits that early caregiving relationships establish
119 internal working models and subsequent relationships with others. As children grow, they
120 internalize their interactions with caregivers, leading to the development of internal working
121 models that shape their adult relationships (Bowlby, 2005; Fairbairn et al., 2018). Secure
122 attachments in a child's development have been associated with the capacity to autonomously
123 regulate emotions and to establish stable relationships in adulthood. Additionally, in the presence
124 of healthy attachments with caregivers, children acquire the ability to mentalize, enabling them to

125 comprehend their own and others' emotional states and regulate them through self-reflection
126 (Fonagy & Luyten, 2018). This mentalization ability involves understanding oneself and others in
127 terms of thoughts, feelings, wishes, and desires. Attachment is a dynamic concept, subject to
128 change over time. Research on relationship formations among sexual minorities individuals
129 indicates that self-acceptance, influenced by interactions with family and peers, significantly
130 impacts attachment styles and development, potentially leading to elevated levels of shame and
131 internalized homophobia (Cartner, 2022). Sexual minority youth report a less secure AS with their
132 mothers; their mothers report less affection for them compared to heterosexual peers and
133 siblings (Rosario et al., 2014). A secure AS has been shown to be a protective factor against drug
134 addiction, and insecure AS a risk factor (Fairbairn et al., 2018; Schindler, 2019), especially among
135 sexual minorities (Rosario et al., 2014). Insecure AS had been associated with more high-risk
136 sexual behavior by GBMSM (Starks et al., 2017). Therefore, engaging in poly-drug use with
137 unsafe sexual practices (i.e., Chemsex) may also serve as a means of developing attachment bonds
138 and belonging to a community (Cartner, 2022). Attachment theory could help to understand
139 preconditions associated with the development of problematic chemsex use (Borhani, 2013). Little
140 clinical data is available on AS of GBMSM with chemsex use: González-Baeza A et al.
141 demonstrate that individuals regularly practicing chemsex frequently exhibited an avoidant-
142 insecure attachment style and early adverse life events compared to the control group (González-
143 Baeza et al., 2023).

144 Currently, care for people who report problematic chemsex is mostly based on prevention and
145 harm reduction (Bourne et al., 2018; Herrijgers et al., 2020; Malandain & Thibaut, 2023) and
146 treatment guidelines are not yet available. The literature reports a scarcity of data concerning the
147 history and current mental health status of GBMSM with problematic chemsex use, as well as the
148 factors contributing to their vulnerabilities and potential intervention strategies.

149 The aim of this study was to assess the AS, mental health history, and psychiatric comorbidities
150 within a population of GBMSM seeking care for problematic chemsex, and their consequence on
151 the severity of the chemsex practice.

152

153 **Methods**

154

155 • *Participants*

156 We assessed an exhaustive cohort of 71 GBMSM over the age of 18, who report problematic
157 chemsex and self-referred to the substance use service in the Saint-Antoine Hospital in Paris,
158 France, between January 2018 and April 2022. All information was self-reported by patients in
159 routine care and anonymized. Since the enactment of the "Jardé" Law (n° 2012-300 of March 5,
160 2012, relating to research involving the human person), there is no need for an ethics committee in
161 a non-interventional study of routine care. All the patients gave written consent and none of them
162 refused to participate in the study. We only used medical data available in their electronic health
163 record for research (AP-HP Health Data Warehouse (EDS)).

164 • *Assessments and evaluation tools*

165 Retrieved data included socio-demographic information, physical and mental health history,
166 description of the chemsex practice and related complications (Table 1). A set of four validated
167 scales were performed evaluating psychiatric symptoms and attachment styles.

168

169 *Psychometric assessment of comorbidities*

170 Hospital Anxiety and Depression (Bjelland et al., 2002; Snaith, 2003; Zigmond & Snaith, 1983)
171 (HAD) scale, Alcohol Use Disorder Identification Test (AUDIT) (Saunders, Aasland, Amundsen,
172 et al., 1993; Saunders, Aasland, Babor, et al., 1993) and Sexual Addiction Screening Test
173 (SAST)(Carnes, 1991; Montgomery-Graham, 2017), all commonly used validated scales in french

174 (Bocéréan & Dupret, 2014; Gache et al., 2005; Hegbe et al., 2020) and self-report scales were
175 given. These scales are frequently used to detect psychiatric disorders.

176

177 *Relationship Scales Questionnaire (RSQ)*

178 The RSQ is a self-report questionnaire of 30 items drawn up from the Relationship Questionnaire
179 of Bartholomew and of the Adult Attachment Scale by Collins and Read (Bowlby, 2005; Collins
180 & Read, 1990). The scores are calculated to define 4 AS: secure, fearful, preoccupied, dismissing
181 (Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994) . We calculated the weighted
182 average of the scores for each attachment dimension and thus determined the patient's predominant
183 attachment style. The score for each AS is assessed on a scale of 0 and 5 and the principal AS for
184 each patient is the one with the highest score. The RSQ can also serve as an assessment tool for
185 self model (SM), representing an individual's self-perceived sense of deserving care, and other
186 model (OM), corresponding to an individual's perception of others as reliable and caring providers.
187 These variables are interrelated following Bartholomew et Horowitz theory (Bartholomew &
188 Horowitz, 1991; Genet & Wallon, 2019) :

- 189 - Secure individuals show positive SM and OM, which build self-esteem.
- 190 - Fearful individuals show negative SM and OM; they fear both intimacy and loneliness and
191 are hyper-reactive to stress.
- 192 - Dismissing individuals show positive SM and negative OM; they learn to turn away from
193 their emotional experience in favor of their professional life and social integration, as a
194 result they place a high value on independence.
- 195 - Preoccupied individuals show negative SM and positive OM, which leads to low self-
196 esteem, doubts, difficulty coping with life's challenges and vagaries, idealization of others.

197 The RSQ is approved in French (Guédeney et al., 2010) and is currently used to evaluate substance
198 users (Borhani, 2013; Fairbairn et al., 2018; Gidhagen et al., 2018).

199

200 • *Statistics*

201 Descriptive statistics include usual parameters: mean \pm standard deviation (SD) or number of
202 subjects and percentages. Data analysis was performed by univariate analysis using ANOVA
203 analysis of variance with Jamovi software (version 2.2.5, <https://www.jamovi.org>). χ^2 tests were
204 performed for nominal variables and independent samples T-Test for continuous variables.

205

206 **Results**

207

208 • *Epidemiology (Table 1)*

209

210 *Demographic characteristics*

211 71 patients were included. The age of the respondents ranged from 22 to 61 years (mean = 40
212 years, SD 9.3). All of our respondents were cisgender men, 67 (94%) of them identified as
213 homosexual, the others as bisexual. 28 (39%) were in a relationship. The majority of respondents
214 were employed (N=63 (89%)) and had obtained at least an undergraduate degree (N=51 (72%)).

215

216 *Physical and mental health history*

217 36 (51%) patients reported being HIV positive, 92% of them (N=33) having an undetectable viral
218 charge. 29 (25%) patients were under PrEP.

219 48 (67%) reported having seen a clinical psychiatrist and 53 (75%) having seen a psychologist
220 before inclusion in the study. 22 (31%) had already been hospitalized in a psychiatric ward, and
221 36 (51%) had already taken an antidepressant medication. 17 (24%) had attempted suicide. 8
222 (11%) had seen a pedopsychiatrist in their lifetime. 22 (31%) reported childhood sex abuse.

223

224 *Psychiatric comorbidities*

225 59% of the sample showed positive results for anxiety disorder (HAD-A score ≥ 11) and 27% for
226 depressive disorder (HAD-D score ≥ 11). One third of the patients (N=22 (31%)) tested positive
227 for hypersexuality disorder, with a SAST score ≥ 13 . The same proportion (N=18 (27%)) had an
228 alcohol use disorder (AUDIT score ≥ 12). 58 (82%) of patients had an overall psychiatric
229 comorbidity, defined as at least one of the 4 disorders.

230

231 *Attachment style*

232 Only 8 (11%) had a secure AS. Of the 89% (63) of insecure men, 39% (28) were classified as
233 preoccupied, 24% (17) were fearful and 25% (18) dismissing. Overall, there were 24 (34%)
234 patients with a SM+ versus 47 (66%) with a SM-. Regarding the OM, half (N=35 (49%)) had a
235 OM+ and the other half a OM- (N=36 (51%)).

236

237 • *Chemsex (Table 2)*

238

239 *Practice*

240 Cathinones (especially 3-MMC) were the most commonly used substances (N=68 (96%)),
241 followed by GBL / GHB (N=60 (85%)), cocaine (N=51 (72%)) and methamphetamine (N=42
242 (59%)). Concurrent use of erectile drugs was also found in 50 (70%) patients.

243 46 (65%) patients practiced slamsex. 43 (61%) practiced chemsex alone, using porn with drugs.
244 30 (42%) patients had not been able to have sex without substances within the last 6 months. When
245 they were asked to rate the quality of their sexual life out of ten before chemsex and at the present
246 time, there is a drop from 6.5 (SD 2.1) to 5.5 (SD 2.6) (p=0.013, see Figure 1).

247

248 *Complications*

249 27 (38%) patients had experienced a loss of consciousness during chemsex and 31 (44%) psychotic
250 symptoms after chemsex. 20 (28%) had already been to an Emergency Department because of

251 chemsex and 7 (9.9%) had already been admitted to an Intensive Care Unit. More than half of
252 patients (N=46 (65%)) had already missed a day of work or an important social event (N=40
253 (56%)) because of chemsex.

254

255 • **Self and other models (Table 3)**

256

257 *Self model*

258 We divided the cohort to compare two groups: SM+ (N=24 (34%)) and SM- (N=47 (66%))
259 patients. SM- patients practiced more alone than SM+ patients (75% vs 33%, $p<0.001$). SM-
260 patients were admitted in ICU (15% vs 0% $p=0.046$), had more overall comorbidities (92% vs
261 63%, $p=0.003$), particularly anxiety (HAD-A mean 12.5 (SD 3.5) vs 9.5 (SD 4.0), $p=0.009$) and
262 sexual addiction (SAST mean 11.2 (SD 4.4) vs 8.3 (SD 5.5), $p=0.022$). We also found more social
263 consequences among SM- patients who were more susceptible to miss an important social event
264 (66% vs 38% $p=0.022$). SM- patients were slightly but significantly older (mean age 38 (SD 8.5)
265 vs 43 (SD 10), $p = 0.041$).

266

267 *Other model*

268 Then we divided the cohort to compare two groups: OM+ (N=35 (49%)) and OM- (N=36 (51%))
269 patients. OM- patients used PreP more than OM+ (53% vs 29%, $p=0.038$), and have more overall
270 comorbidities (92% vs 71%, $p=0.027$). OM+ patients practice more slamsex than OM- patients
271 (80% vs 50%, $p=0.008$). OM- patients.

272

273

274

275

276 **Discussion**

277

278 • **Psychiatric comorbidities and attachment styles**

279 In the present study, we evaluated mental health history, psychiatric comorbidities, AS and its
280 impact on the severity of chemsex practice within a population of 71 GBMSM seeking help for
281 problematic chemsex.

282 Half of patients experienced psychotic symptoms or unconsciousness while practicing chemsex,
283 which is consistent with the literature (Hampel et al., 2020). These complications often lead to
284 hospitalization, with 28% being admitted to an Emergency Room and 9.9% to an ICU. 65%
285 declared absenteeism at work related to chemsex. These severe complications give insight into the
286 urgent need to offer the GBMSM community proper care for those who report problematic
287 chemsex. Some studies, based on the possible links to sexual addiction, list possible medications
288 and propose innovative transcranial stimulation neuromodulation (Malandain, Blanc, Ferreri, &
289 Thibaut, 2020; Malandain, Blanc, Ferreri, Giorgiadis, et al., 2020). Mirtazapine helps reduce
290 consumption and maintain abstinence of sexualized methamphetamine use (Coffin et al., 2020;
291 Trivedi et al., 2021).

292 Few studies evaluate psychotherapy and AS among GBMSM with problematic chemsex (Cartner,
293 2022; González-Baeza et al., 2023). Sixty-three (89%) of the participants of our study had an
294 insecure AS. González-Baeza *et al.* showed that 81% of the 41 participants engaged in chemsex
295 and 57% of the GBMSM control group had an insecure AS. This can be compared with the fact
296 that a third of the general population displays an insecure AS (Mickelson et al., 1997). A meta-
297 analysis of Schindler *et al.* (Schindler, 2019) showed consistent evidence of an association between
298 insecure AS and substance abuse. An insecure attachment pattern increases the risk of SUD but
299 substance use also predicts a deterioration in attachment relationships. Landolt et al.'s research
300 showed that peer exclusion may contribute to the development of insecure attachment patterns in
301 young gay men (Landolt et al., 2004). With problematic chemsex linked to substance use disorders
302 affecting GBMSM, attachment theory is therefore crucial to understanding these vulnerabilities.

303

304 Attachment theory stresses the importance of the therapeutic alliance in developing attachment
305 security (Schindler, 2019). Specific engagement strategies can be developed and tailored to
306 individual attachment patterns. Avoidant individuals could have more difficulties establishing
307 therapeutic relationships. Attachment-based psychotherapies are well studied in treating patients
308 with personality disorders, depression and in adolescents (Heerde et al., 2019; Stefini et al., 2013).
309 They can also achieve positive outcomes in the care of GBMSM with problematic chemsex
310 (Cartner, 2022).

311 Lafortune *et al.* identify dealing with painful emotions or stressful events, giving into interpersonal
312 pressure or fulfilling desire for community belonging as psychological and interpersonal factors
313 associated with chemsex-related behaviors (Lafortune et al., 2021). This was consistent with our
314 findings. Mental health background is therefore crucial to understanding GBMSM who report
315 problematic chemsex. 82% (58) of our sample had a dual diagnosis among depression, anxiety,
316 AUD or sexual addiction. In the literature, psychiatric comorbidities seemed lower, but remained
317 significantly higher than in the general population (Hampel et al., 2020; Vu et al., 2017). Bohn *et*
318 *al.*(Bohn et al., 2020) found that 8.3% and 11.9% of GBMSM with chemsex use suffer from
319 anxiety and depressive disorders, respectively, compared to 59% and 27% in our study. We
320 investigated a care-seeking population whereas Bohn *et al.* performed an online survey, potentially
321 recruiting GBMSM who do not have problematic chemsex and complications. Regarding
322 hypersexual disorder, there is an overlap between the item of the SAST and chemsex. Most
323 chemsex users spent much more time than they wished practicing sex or considered that their sex
324 life negatively affects their health. This can explain the high proportion (31%) of patients with
325 positive diagnosis at the SAST. An adapted version of a hypersexuality scale could be useful in
326 this specific population.

327 Patients in our sample presented a high rate of difficult or traumatic life events. One-third of the
328 sample declared childhood sex abuse, as described in a systematic review about childhood sexual

329 abuse among GBMSM (Lloyd & Operario, 2012). Among young GBMSM, co-occurrence of
330 childhood sexual abuse, other psychological and social problems, or substance abuse are
331 associated with higher rates of sexual risk behavior (Mustanski et al., 2007). Exposure to early
332 adverse events appears to generate abnormal central nervous system maturation due to high levels
333 of cortisol exposure (Raymond et al., 2018). Trauma theories consider that adverse early traumatic
334 experiences could overwhelm a child's developmental capacity to manage emotions leading to
335 dysregulation of AS (Fassbinder et al., 2016). One quarter of the sample self-reported lifetime
336 suicidal ideation. It is more than the 11-13% found in the larger GBMSM population (Lian et al.,
337 2015; Rüütel et al., 2017). GBMSM with problematic chemsex could be an at-risk subgroup of
338 GBMSM, who are themselves at a higher risk for mental health disorder than the general
339 population. The higher prevalence in SUD found in LBGTQ+ community has been described as a
340 unhealthy way of coping with systemic homophobia (Avery-Desmarais et al., 2020) .

341

342 **● Influence of the self and other models**

343 We explored SM and OM to determine risk factors of complications of chemsex (Table 3).
344 GBMSM with SM- or OM- showed higher rates of overall psychiatric comorbidities. GBMSM
345 with SM- or OM- should benefit the most from psychotherapy. 46 (65%) of our patients practiced
346 slamsex, and OM+ more than OM- patients. We could hypothesize that OM+ users view others as
347 more trustworthy in sexual intercourse, as they are less likely to use PrEP. False beliefs about the
348 perceived trustworthiness of sex partners should be integrated into tailormade harm reduction
349 intervention, based on attachment style.

350

351 **● Strengths and limitations**

352 The first strength of this study is the description of detailed mental health background within a
353 GBMSM sample with problematic chemsex. The demographic and clinical data of our sample are
354 compatible with larger studies investigating chemsex (Blomquist et al., 2020; Giorgetti et al.,

355 2017; Nimbi et al., 2020; Reback et al., 2013; Schmidt et al., 2016; Vu et al., 2017), but with more
356 precise data. The exploration of the AS of patients lead to new opportunities in terms of care and
357 psychotherapy. Among the limitations of this paper is the small sample size, which lowers the
358 strength of the study. There may also be a recruitment bias: patients sought care and therefore
359 already had a certain insight into their trouble. It could be useful to compare this data with a larger
360 sample of GBMSM who practice non-problematic chemsex. A better comprehension of the
361 complications of chemsex could lead to the definition of gravity criteria, which are a crucial need
362 in clinical practice.

363

364 **Conclusion**

365 Firstly, as problematic chemsex involves substance use disorder and interpersonal relationships,
366 AS theory could be useful in clinical practice. In psychotherapy, Gidhadgen *et al.* (Gidhagen et al.,
367 2018) suggest that a change from insecure to secure AS is an important goal for SUD care, as it
368 may prevent the patient from using substances to regulate emotions and interpersonal
369 relationships. The AS could be assessed and become part of individual treatment planning and
370 harm reduction strategy.

371 Secondly, GBMSM with people who report problematic chemsex are particularly vulnerable in
372 mental health terms, with frequent history of abuse, suicidal ideation as well as a majority
373 presenting psychiatric comorbidities. Mental health screening should be offered to GBMSM with
374 problematic chemsex, as well as the possibility to be referred to a mental health professional. Our
375 results show that strong interaction is needed between sexual health clinics, community service
376 and mental health service. This could have a strong impact on patient outcomes, as the guidelines
377 for dual diagnosis show that co-occurrent SUD and a psychiatric disorder should be diagnosed and
378 treated to improve global care and prognosis (Tikka et al., 2014). Integrated intervention models
379 designed for GBMSM should be implemented to address the specific need for sexual and mental
380 health.

381 Finally, the emergence of NPS shows the necessity for a monitoring of the substance used in the
382 chemsex practice. Chemsex scene and substance use are constantly evolving , with an increase of
383 the use of synthetics cathinones that is potentially understated (Daziani et al., 2023; Gomila Muñiz
384 et al., 2022). Knowing the specificity of the substance used and the practice makes it possible to
385 prevent complications and propose tailored treatment approaches based on community and clinical
386 practices (Pires et al., 2022).

387 As chemsex is one of the greatest challenges that the GBMSM and LGBTQ+ community is facing,
388 there is an urgent need for integrated intervention between sexual addiction and mental health
389 services to improve community care.

390

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393

394 **Conflict of interest:**

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396

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399

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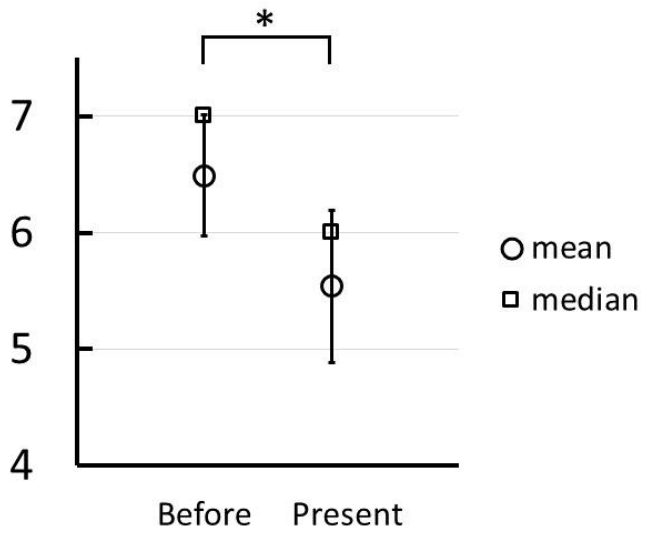
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750 **Figure 1.** Quality of sexual life before chemsex use disorder and at the time of assessment, rated
751 by patients with a 0 to 10 numerical scale. * means $p < 0.05$.

752

753

N=71	N (%) or mean (SD)
Demographic Characteristics	
Age	40 (9.3)
Relationship Status	28 (39)
Diploma	
Middle School	6 (8.0)
High School	14 (20)
Undergraduate Degree	15 (21)
Graduate Degree	36 (51)
Employed	63 (89)
Sexual Orientation	
Homosexual	67 (94)
Bisexual	4 (5.6)
Medical and Psychiatric History	
HIV Positive	36 (51)
Undetectable Viral Charge	33 (92)
Receiving PrEP Treatment	29 (41)
History of Hepatitis C Infection	18 (25)
History of Sexual Abuse	22 (31)
Mental Health History	
psychiatric care	48 (67)
psychological care	53 (75)
inpatient in psychiatry department	22 (31)
antidepressant treatment	36 (51)
suicide attempt	17 (24)
childhood psychiatric follow-up	8 (11)
Psychiatric Comorbidities and Attachment Style	
Depressive Disorder (HAD-D score ≥ 11)	19 (27)
Anxiety Disorder (HAD-A score ≥ 11)	42 (59)
Alcohol Use Disorder	
High-risk consumption (AUDIT score 8-12)	7 (10)
Alcohol dependence (AUDIT score ≥ 12)	18 (27)
Sexual addiction (SAST score ≥ 13)	22 (31)
Attachment Style (RSQ)	
Secure	8 (11)
Fearful	17 (24)
Dismissing	18 (25)
Preoccupied	28 (39)

754 **Table 1.** Characteristics of the patients. HAD: Hospital Anxiety and Depression scale. AUDIT: Alcohol use disorder
755 identification test. SAST: Sexual addiction screening test. RSQ: relationship scales questionnaire. Percentages or
756 standard deviations (SD) are in parentheses.

N=71	N (%)
Chemsex Practice	
Slamsex	46 (65)
Use chemsex substance alone	43 (61)
Sex without substance within the last 6 months	41 (58)
PrEP Treatment	29 (41)
Substances Used	
Cathinones	68 (96)
GHB/GBL	60 (85)
Cocaine	51 (72)
Erectile dysfunction drugs	50 (70)
Methamphetamine	42 (59)
MDMA	32 (46)
Ketamine	26 (37)
Complications Resulting from Chemsex	
Emergency department consultation	20 (28)
Intensive Care Unit admission	7 (9.9)
Psychotic symptoms	31 (44)
Loss of consciousness during chemsex	27 (38)
Overall psychiatric comorbidity	58 (82)
Missed a day of work	46 (65)
Missed an important event	40 (56)

758 **Table 2.** Chemsex practice and complications. Percentages are in parentheses.

N=71	Self model			Other model		
	SM+ (N=24)	SM- (N=47)	p-value	OM+ (N=35)	OM- (N=36)	p-value
Chemsex practice						
Slamsex	14 (58)	32 (68)	0.416	28 (80)	18 (50)	0.008
Practice chemsex alone	8 (33)	35 (75)	<0.001	20 (57)	23 (64)	0.561
Sex without substance within the last 6 months	15 (63)	26 (55)	0.562	23 (66)	18 (50)	0.180
Use of PrEP	9 (38)	20 (43)	0.682	10 (29)	19 (53)	0.038
Complications Resulting from Chemsex						
Emergency Department consultation	5 (21)	15 (32)	0.326	9 (26)	11 (31)	0.650
Intensive Care Unit admission	0 (0.0)	7 (15)	0.046	4 (11)	3 (8.3)	0.662
Psychotic symptoms	12 (50)	19 (40)	0.442	16 (46)	15 (42)	0.731
Loss of consciousness during chemsex	6 (25)	21 (45)	0.106	14 (40)	13 (36)	0.736
Overall psychiatric comorbidity	15 (63)	43 (92)	0.003	25 (71)	33 (92)	0.027
Missed a day of work	14 (58)	32 (68)	0.416	23 (66)	23 (64)	0.872
Missed an important event	9 (38)	31 (66)	0.022	21 (60)	19 (53)	0.540

760 **Table 3.** Chemsex practice and complications comparing MS+ and MS- patients and MO+ and MO- patients.

761 Percentages are in parentheses.

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