



Sexual, addiction and mental health care needs among men who have sex with men practicing chemsex – a cross-sectional study in the Netherlands

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ABSTRACT

Drug use during sex ('chemsex') has been associated with sexually transmitted infections (STIs) and mental health harms. Little quantitative evidence exists on the health care needs of MSM practicing chemsex from a patient perspective. This study assessed self-perceived benefits and harms and the needs for professional counselling among MSM practicing chemsex. In 2018, 785 MSM were recruited at nine Dutch STI clinics and 511 (65%) completed the online questionnaire. Chemsex was defined as using cocaine, crystal meth, designer drugs, GHB/GBL, ketamine, speed and/or XTC/MDMA during sex < 6 months. Chemsex was reported by 41% (209/511), of whom 23% (48/209) reported a need for professional counselling. The most reported topic to discuss was increasing self-control (52%, 25/48). Most MSM preferred to be counselled by sexual health experts (56%, 27/48). The need for professional counselling was higher among MSM who engaged in chemsex ≥ 2 times per month (30% vs. 17%, $p = 0.03$), did not have sex without drugs (sober sex) in the past three months (41% vs. 20%, $p = 0.04$), experienced disadvantages of chemsex (28% vs. 15%, $p = 0.03$), had a negative change in their lives due to chemsex (53% vs. 21%, $p = 0.002$), and/or had an intention to change chemsex behaviours (45% vs. 18%, $p < 0.001$). Our study shows that almost one in four MSM practicing chemsex expressed a need for professional counselling on chemsex-related issues. STI healthcare providers should assess the need for professional counselling in MSM practicing chemsex, especially in MSM with above mentioned characteristics, such as frequent users.

1. Introduction

Men who have sex with men (MSM) are increasingly using drugs in a sexual context, a phenomenon referred to as chemsex (Bourne et al., 2014; Kenyon et al., 2018). Constructing a universal definition of chemsex is difficult, as the drugs used might vary per place and time area. In the United Kingdom (UK), chemsex is defined by the use of crystal methamphetamine, mephedrone, γ -Butyrolactone (GBL)/ γ -

hydroxybutyric acid (GHB) during sex (Georgetti et al., 2017; Hegazi et al., 2017; Kirby and Thornber-Dunwell, 2013; Measham et al., 2011). In the Netherlands, ecstasy (XTC), GHB and ketamine are the most popular drugs to use during sex among MSM (Achterbergh et al., 2019; Evers et al., 2019).

Although chemsex can increase sexual pleasure for MSM (Weatherburn et al., 2017; Graf et al., 2018), it could also lead to several health harms. Chemsex has been associated with condomless

Abbreviations: STI, sexually transmitted infection; MSM, men who have sex with men; GHB, γ -hydroxybutyric acid; GBL, γ -Butyrolactone; MDMA, 3,4-Methylenedioxy-methamphetamine; XTC, ecstasy

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anal intercourse (Glynn et al., 2018; Druckler et al., 2018; Frankis et al., 2018; Kenyon et al., 2018) and an increased risk of sexually transmitted infections (STIs) (Druckler et al., 2018; Hegazi et al., 2017; Pufall et al., 2018). Furthermore, concern has been expressed by health care providers about the impact of chemsex on the psychosocial well-being of MSM (Bourne et al., 2015). Drug use in MSM has been associated with poor mental health, such as anxiety and depression (Rosario et al., 2006; Kurtz, 2005), especially among MSM who considered their drug use to be problematic (Prestage et al., 2018).

Scarce data is available on the extent to which chemsex is perceived to be problematic by MSM practicing chemsex and what their chemsex-related health care needs are. A recent systematic review (Tomkins et al., 2019) identified a lack in research that addresses the proportion of MSM practicing chemsex who need professional counselling. Only one quantitative study among MSM practicing chemsex in Ireland showed that one in four MSM reported a negative impact of chemsex on their lives and one in three MSM would like to receive professional help or advice about chemsex preferably from the STI clinic they were attending (Glynn et al., 2018). However, it remained unclear which characteristics were associated with having a need for professional counselling. For example whether these MSM engaged in chemsex more frequently compared to MSM without this need. Understanding the characteristics of MSM practicing chemsex with a need for professional counselling could help health care professionals to target prevention and care strategies. In addition, scarce data is available on what topics professional counselling should focus on from a patient point of view. Identifying the topics MSM would like to discuss with professionals could help to tailor chemsex prevention and care strategies. The current study aims to understand (1) to what extent MSM practicing chemsex perceive chemsex to be problematic by assessing self-perceived benefits and harms, the impact on their daily lives and intention to change chemsex behaviour and (2) the need for professional counselling among MSM practicing chemsex, including characteristics of MSM with this need, their preferred type of health care professionals and topics for counselling.

2. Methods

2.1. Study design

The outpatient Public Health Service STI clinics in the Netherlands offer free and anonymous STI and HIV testing, hepatitis B vaccinations, and sexual health counselling for risk groups, such as MSM. MSM was defined as a man who reported having sex with a man in the preceding six months. Study nurses of nine STI clinics in the Netherlands were instructed to recruit MSM aged 16 years or older during their regular STI consultations for participation in an online questionnaire on drug use in 2017–2018. Recruitment was passive and regardless of reported drug use during the consultation. At the time of recruitment, no protocol on chemsex-related counselling or interventions were available at the participating STI clinics. A list of participating STI clinics can be found in [Supplementary file I](#).

2.2. Procedures

All MSM were routinely universally tested for urogenital, anorectal, and oropharyngeal *Chlamydia trachomatis* (chlamydia), *Neisseria gonorrhoeae* (gonorrhoea), HIV, hepatitis B and syphilis. Each consultation included a standardized nurse-taken medical and sexual history, including sociodemographic characteristics and sexual behaviour in the preceding six months. These data were registered in an electronic patient registry. Up to one week after the STI consultation, the questionnaire was sent by email to all MSM who had agreed to participate in the study. The questionnaire included multiple-choice and open-ended questions about drug use before or during sex in the preceding six months, which types were used ([Supplementary file II](#)) and the

frequency of use. In those reporting any drug use during sex, additional questions on the setting, motives, self-perceived disadvantages of chemsex, intention to change their drug using behaviour, and the need for professional counselling were included. Electronic patient registry data containing data of sexual behavior and biological STI test results of the inclusion consultation were linked to the online questionnaire.

2.3. Chemsex definition

Chemsex was defined as the use of drugs before or during sex in the past six months. The drugs included in this definition were crystal meth, cocaine, designer drugs (2-CB, 3 MMC, 4-FA, 4-MEC), GHB, GBL, ketamine, MDMA, mephedrone, speed, and XTC. In the United Kingdom (UK), chemsex is often defined as only the use of crystal meth, GHB/GBL or mephedrone (referred to as 'four-chems') during sex (Giorgetti et al., 2017). In this study, a broader definition of chemsex was used, as previous studies have shown that other drugs, such as cocaine, ketamine and MDMA, are also commonly used during sex in the Netherlands. Alcohol and cannabis are generally excluded from the chemsex definition because of their common use in a recreational context (Knoops et al., 2015).

2.4. Variables

2.4.1. Sociodemographic characteristics and sexual history

Dutch socioeconomic status (SES) scores based on income, educational level and employment were extracted from the Netherlands Institute for Social Research (<http://www.scp.nl>) per four-digit postal code area. Age and SES were based on tertile distributions. Educational level was measured as current education or highest level of education completed and was categorized into lower educated (pre-vocational secondary education, secondary vocational education) and higher educated (university, higher professional education, pre-university/senior general secondary education). Ethnicity was divided into Western ethnicity (persons born in Europe (excluding Turkey), North-America, Oceania, Indonesia or Japan) and non-Western ethnicity (persons born or of whom at least one parent was born in Africa, Latin America, Asia (excluding Indonesia or Japan) or Turkey) and was based on the definition of Statistics Netherlands (www.cbs.nl). Reported commercial sex work (CSW), sexual preference, number of sex partners in the preceding six months, HIV status, and recent STI diagnoses (diagnosed with chlamydia, gonorrhoea, HIV, hepatitis B, and/or syphilis during the inclusion consultation) were available from the coded electronic patient registry data.

2.4.2. Chemsex behaviours

Frequency of chemsex was calculated from the frequency of the drug type that was most frequently used (measured by a multiple choice question per drug type: ≤ 1 time per month, 2–4 times per month, 2–3 times per week, ≥ 4 times per week). The total number of different drugs used in the preceding six months was calculated as the sum of all drugs, and categorized into 1–2 drugs, 3–4 drug, and ≥ 5 drugs, based on tertile distribution. Last time sex without drugs (sober sex) was measured by a multiple choice question (in the past three months, more than three months ago, in the past year, more than one year ago). Years from chemsex debut, further referred to as duration of use, was calculated from the current age of participants minus the age of chemsex debut and categorized into 0–5 years, 6–12 years and ≥ 13 years, based on tertile distribution. Combining drugs included the use of at least two different drugs during one chemsex session. Intention to change chemsex behaviours included the intention to quit drug use, decrease the frequency of using drugs, combine fewer different drugs, and/or lower the dose of drugs.

2.4.3. Experiences of chemsex

Experience of disadvantages and unwanted sexual experiences after

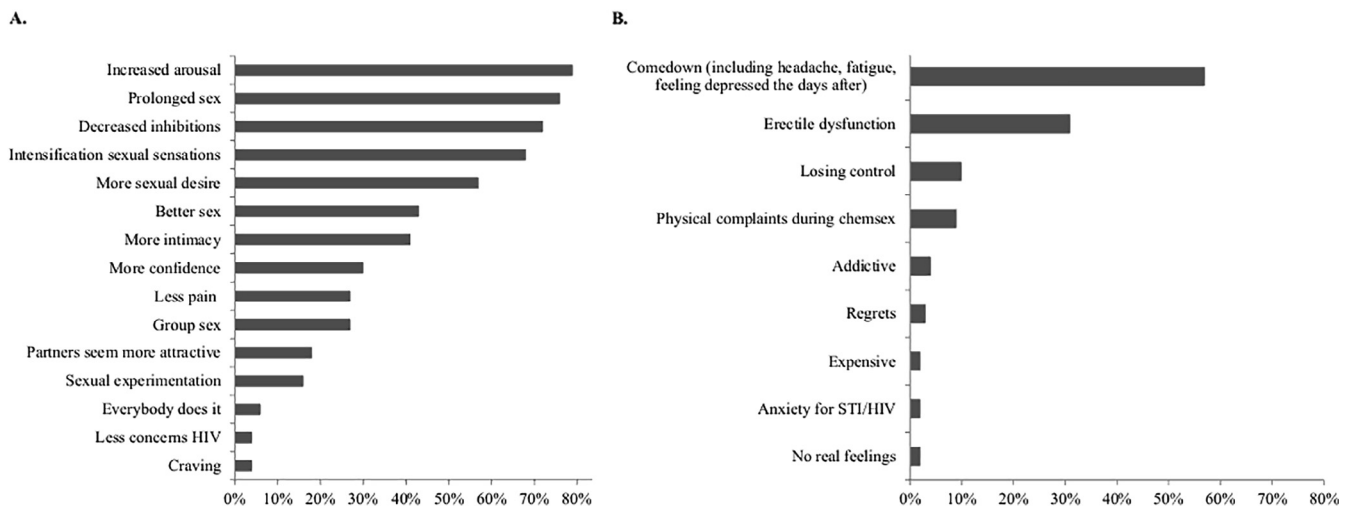


Fig. 1. Motives and experienced disadvantages of chemsex. A) Motives for having chemsex among MSM practicing chemsex (N = 209), measured by a multiple choice question, note: the motives being part of a community, social pressure, less concerns about hepatitis C, because of customers, and less concerns about bacterial STI were reported by less than 3% and therefore not presented in the figure; B) Experienced disadvantages among MSM practicing chemsex who reported to experienced disadvantages (N = 127), measured by an open question, in the Netherlands in 2018.

using drugs during sex were dichotomized for analyses. Experienced impact of practicing chemsex on one's daily life was categorized into no impact, positive and negative impact, in which for example 'social isolation' was categorized as negative and 'more intimacy' as positive.

2.4.4. Needs for professional counselling

The need for professional counselling was measured using the question: 'Would you like to talk to a health care professional about drug use during sex?'. The question was broadly formulated to provide an explorative insight whether any information, help, intervention or referral was needed. The outcome need for professional counselling in analyses included the answering options 'yes' and 'maybe'. Health care professionals and topics for counselling included in the questionnaire can be found in [Supplementary file III](#).

2.5. Statistical analyses

Participants were defined as all MSM who fully completed the questionnaire. The proportion of MSM practicing chemsex was calculated among all participants (n = 511). Further analyses were restricted to participants who reported chemsex in the preceding six months (n = 209). Descriptive statistics were used to present the proportion of MSM reporting specific motives, self-perceived disadvantages, changes in daily life, and intention to change chemsex behaviours (primary outcome). Descriptive statistics were used to calculate the proportion of MSM reporting a need for professional counselling. Characteristics of MSM reporting a need for professional counselling and MSM who did not were compared using chi-square tests (secondary outcome). Characteristics tested included sociodemographic characteristics, sexual history, chemsex behaviours, and experiences of chemsex, which are described above under variables. All analyses were performed using SPSS V24 (IBM SPSS Statistics for Windows, IBM Cooperation, Armonk, New York, USA). P-values < 0.05 were considered statistically significant.

2.6. Ethics statement

This study was approved by the Medical Ethical Committee of the University of Maastricht. STI patient registry data was collected within standard care. Separate approval from the Medical Ethical Committee of the University of Maastricht was obtained to use and link the questionnaire data to the electronic patient registry data (METC 2018-

0485).

3. Results

3.1. Characteristics of participants

A total of 785 (23%) MSM were recruited to participate during the study period and 511 (65%) fully completed the questionnaire. Participants had a median age of 38 years (IQR: 27–50), 63% was higher educated and 90% had a Western ethnicity. The median number of sex partners in the preceding six months was 6 (IQR: 3–10) and 23% was recently diagnosed with an STI. Chemsex in the preceding six months was reported by 41% of MSM (209/511). The most reported drugs were XTC/MDMA (82%, 172/209), GHB/GBL (77%, 160/209), and ketamine (41%, 85/209). Crystal meth was used by 8% (16/209) and mephedrone by 5% (10/209). Intravenous injection of drugs was reported by 8% (16/209), the following drugs were injected: 4-MEC (50%, 8/16), 3-MMC (44%, 7/16), crystal meth (44%, 7/16) and ketamine (31%, 5/16). One in four MSM (24%, 51/209) used five or more different drugs in the preceding six months. Almost half of MSM (45%, 93/209) engaged in chemsex at least two times per month. The majority (77%, 160/209) of MSM who had sex with drugs also had sex without drugs in the past month. Thirteen percent (27/209) of MSM who had sex with drugs had their last sex without drugs more than three months ago.

3.2. Motives, experienced disadvantages and impact on daily life

The most reported motives for having chemsex and experienced disadvantages are presented in [Fig. 1a](#). Two-thirds of MSM (127/209) experienced disadvantages of chemsex ([Fig. 1b](#)). Unwanted sexual experiences were reported by 18% (39/209). A negative impact on daily life since one started practicing chemsex was reported by 9% (19/209). Examples of negative changes were: 'dependency on drugs' (n = 6), 'HIV infection' (n = 2), 'loneliness' (n = 2), 'fatigue' (n = 1), and 'rape' (n = 1). A positive impact was reported by 31% (64/209). Examples of positive changes mentioned were: 'enjoying sex' (n = 12), 'enrichment of (sex)life' (n = 11), and 'feeling free and relaxed' (n = 9). The majority (60%, 126/209) reported no change in their daily lives.

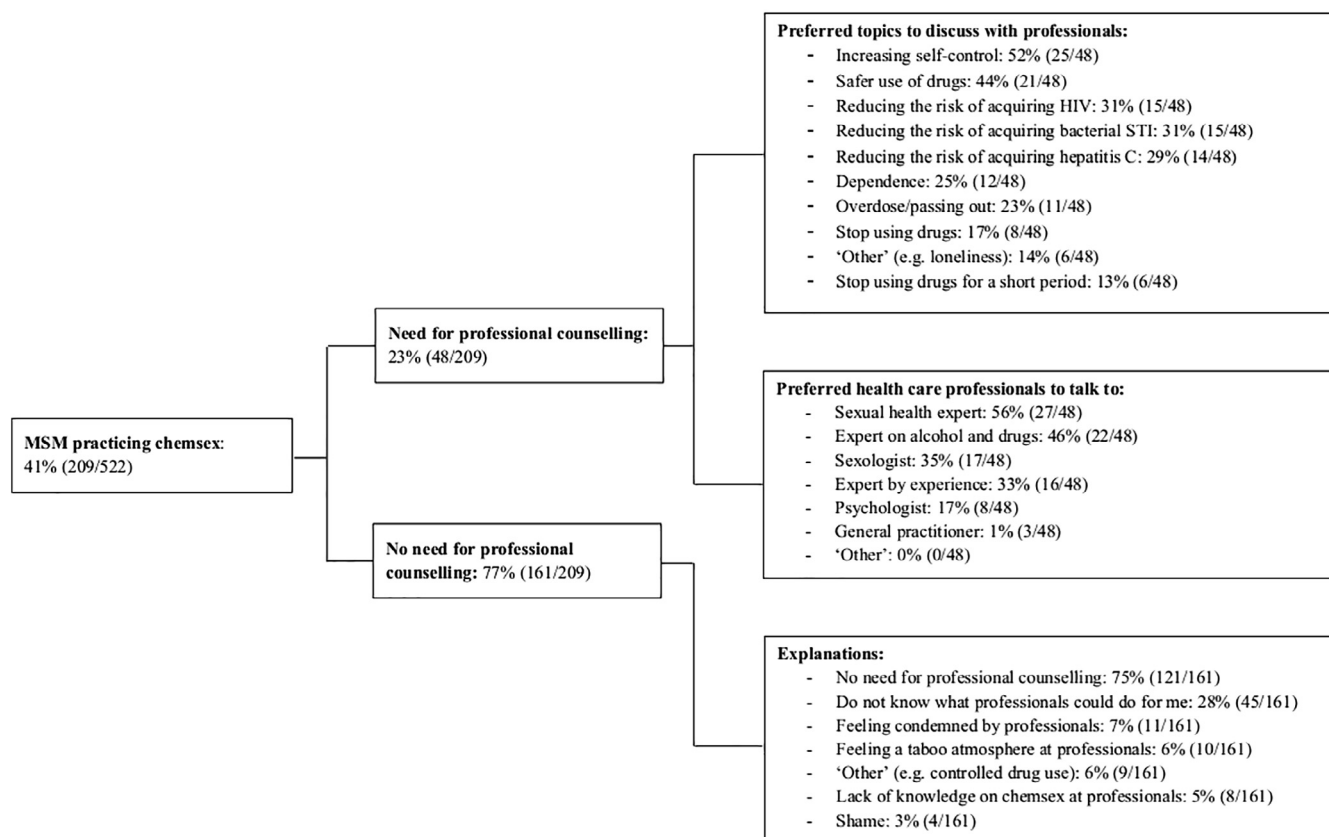


Fig. 2. Needs for professional counselling including preferred topics and health care professionals among MSM with a need for professional counselling (N = 48) and explanations for having no need for professional counselling among MSM without a need for professional counselling (N = 161), in the Netherlands in 2018.

3.3. Intention to change chemsex behaviours

Intention to change chemsex behaviours was reported by 19% (40/209) of all MSM practicing chemsex. Decreasing the frequency of drug use was the most reported intended change (70%, 28/40), followed by quitting drug use (45%, 18/40), lowering the dose (35%, 14/40), and combining fewer drug types (8%, 3/40). Of MSM with an intention to change chemsex behaviours, 45% (18/40) also indicated a need for professional counselling.

3.4. The need for professional counselling

The need for professional counselling was reported by 6% (13/209), 17% (35/209) indicated that they might want to be counselled, and 77% (161/209) indicated no need for professional counselling. The need for professional counselling was comparable between MSM who used at least one of the four-chems (crystal meth, GHB, GBL, mephedrone, UK definition of chemsex) and MSM who only used other drugs than these four-chems during sex (22% versus 26%, $p = 0.64$). Most participants with a need for professional counselling preferred to talk to a sexual health expert or an expert on alcohol and drugs (Fig. 2). Most reported topics to discuss with professionals were increasing self-control, safer drug use, and reducing the risk of acquiring HIV or an STI (Fig. 2). Of MSM practicing chemsex who did not want to be counselled by a professional, the majority did not experience any need or did not know what professionals could do for them (Fig. 2). A perceived stigma on discussing chemsex with health care professionals was reported by 14% (29/209).

3.5. Characteristics of MSM with a need for professional counselling

The need for professional counselling was higher among MSM who

engaged in chemsex at least two times per month, did not have sex without drugs in the past three months, experienced disadvantages, experienced a negative life change, or had the intention to change chemsex behaviours (Table 1).

4. Discussion

This is one of the first quantitative studies that explores whether MSM perceive chemsex as problematic in their daily lives and whether they have a need for professional counselling. This study provides insight into the characteristics of MSM practicing chemsex who indicated a need for professional counselling and their specific needs.

A higher proportion of MSM practicing chemsex was found in our study (41%) compared to other studies among MSM visiting the STI clinics in large cities in several Western countries (17–27%) (Maxwell et al., 2019). A possible explanation could be the broad chemsex definition we used in our study compared to these other studies. However, the use of specific drugs, for example GHB, was also higher in our study (31%) compared to a study among MSM visiting the STI clinic in Amsterdam (16%) (Druckler et al., 2018). Possibly, we included high-risk MSM in our study which might have resulted in a higher proportion of chemsex.

Our study shows that for MSM chemsex is a way to enhance sexual pleasure, by increasing arousal, prolonging sex, and intensifying sexual sensations. Qualitative studies with MSM in London also suggested that chemsex might be seen as a strategic choice for enhancing the qualities valued in sex (Bourne et al., 2015; Weatherburn et al., 2017). At the same time, our study shows that more than half of men practicing chemsex experienced disadvantages. Most of these disadvantages were negative short term effects of drugs, such as headache and fatigue. A negative impact on one's daily life was reported by one in ten MSM. Men experiencing a negative impact reported serious health harms,

Table 1
Characteristics of MSM who reported a need for professional counselling in the Netherlands in 2018.

	All MSM practicing chemsex (N = 209)	MSM with a need for professional counselling (n = 48, 23%)	MSM with no need for professional counselling (n = 161, 77%)	P
	% (N) of total	% (N) within groups	% (N) within groups	
Characteristics^a				
Age				0.905
16–29	18.4 (38)	21.1 (8)	78.9 (30)	
30–44	36.7 (76)	21.1 (16)	78.9 (60)	
45–74	44.9 (93)	23.7 (22)	76.3 (71)	
Ethnicity				0.304
Western	92.8 (192)	21.4 (41)	78.6 (151)	
Non-western	7.2 (15)	33.3 (5)	66.7 (10)	
Educational level				0.448
Lower educated	38.6 (80)	25.0 (20)	75.0 (60)	
Higher educated	62.4 (127)	20.5 (26)	79.5 (101)	
SES^b				0.488
Low	33.3 (65)	24.6 (16)	75.4 (49)	
Medium	29.2 (57)	21.1 (12)	78.9 (45)	
High	37.4 (73)	16.4 (12)	83.6 (61)	
Commercial sex work				0.366
No	97.6 (202)	21.8 (44)	78.2 (158)	
Yes	2.4 (5)	40.0 (2)	60.0 (3)	
Sexual preference				0.707
Men	86.5 (179)	21.8 (39)	78.2 (140)	
Men and women	13.5 (28)	25.0 (7)	75.0 (21)	
Number of sex partners				0.246
1–4	21.4 (44)	31.8 (14)	68.2 (30)	
5–10	31.1 (64)	18.8 (12)	81.3 (52)	
greater than 10	47.6 (98)	20.4 (20)	79.6 (78)	
Recent STI diagnosis^c				0.677
No	64.0 (130)	20.8 (27)	79.2 (103)	
Yes	36.0 (73)	23.3 (17)	76.7 (56)	
HIV status				0.505
Negative	73.4 (152)	21.1 (32)	78.9 (120)	
Positive	26.6 (55)	25.5 (14)	74.5 (41)	
Chemsex behaviour				0.405
Total number drugs used				0.028
1–2	39.2 (82)	24.4 (20)	75.6 (62)	
3–4	34.9 (73)	17.8 (13)	82.2 (60)	
≥ 5	25.8 (54)	27.5 (14)	72.5 (37)	
Frequency chemsex^d				0.195
≤ 1 time per month	55.5 (116)	17.2 (20)	82.8 (96)	
≥ 2 times per month	44.5 (93)	30.1 (28)	69.9 (65)	
Duration of use (years)^e				0.663
0–5	35.7 (74)	23.0 (17)	77.0 (57)	
6–12	30.4 (63)	28.6 (18)	71.4 (45)	
≥ 13	33.8 (70)	15.7 (11)	84.3 (59)	
Combining drugs				0.026
No	18.7 (39)	25.6 (10)	74.4 (29)	
Yes	81.3 (170)	22.4 (38)	77.6 (132)	
Last time sober sex^f				< 0.001
Past three months	87.1 (182)	20.3 (37)	79.7 (145)	
More than three months ago	12.9 (27)	40.7 (11)	59.3 (16)	
Intention to change chemsex behaviours				
No	81.9 (169)	17.8 (30)	82.2 (139)	
Yes	19.1 (40)	45.0 (18)	55.0 (22)	

Table 1 (continued)

	All MSM practicing chemsex (N = 209)	MSM with a need for professional counselling (n = 48, 23%)	MSM with no need for professional counselling (n = 161, 77%)	P
	% (N) of total	% (N) within groups	% (N) within groups	
Experiences chemsex				
Experience of disadvantages				0.019
No	39.2 (82)	14.6 (12)	85.4 (70)	
Yes	60.8 (127)	28.3 (36)	71.7 (91)	
Impact on daily life				0.009
No impact	60.3 (126)	18.3 (23)	81.7 (103)	
Positive	30.6 (64)	23.4 (15)	76.6 (49)	
Negative	9.1 (19)	52.6 (10)	47.4 (9)	
Unwanted sexual experiences				0.099
No	81.3 (170)	20.6 (35)	79.4 (135)	
Yes	18.7 (39)	33.3 (13)	66.7 (26)	

Note: the proportion of MSM who indicated a need for professional counselling did not differ between different STI clinic regions (p = 0.412)

^a Characteristics of two participants practicing chemsex were missing in the STI patient registry.

^b Data of 14 participants were missing as postal code was not recorded.

^c Laboratory confirmed STI test results. Recent STI diagnoses were missing for six participants in the STI patient registry.

^d Frequency chemsex: categories 2–4 times per month (n = 82), 2–3 times per week (n = 8) and ≥ 4 times per week (n = 3) were combined into ≥ 2 times per month.

^e Age of two participants practicing chemsex was missing and duration of use could therefore not be calculated for two participants.

^f Last time sober sex: categories more than 3 months (n = 27), in the past year (n = 0) and more than 1 year ago (n = 0) were combined into one category more than 3 months ago. Of the 27 MSM who did not have sober sex in the past three months, 85% (23/27) practiced chemsex in the past month.

such as dependency on drugs, loneliness and HIV infection. Health care providers frequently visited by MSM, such as STI clinics, could play an important role in signalling these health harms and refer men to mental or addiction help when needed. The majority of men practicing chemsex reported no impact or a positive impact of chemsex on their daily lives, suggesting that there is also a group that does not experience chemsex to be problematic. This confirms a recent study (Glynn et al., 2018) showing that three-quarters of MSM practicing chemsex enjoyed it and were in control of their sex life.

Our study shows that one in four MSM practicing chemsex might want to be counselled on chemsex by a professional. We show that the need for professional counselling was similar for MSM using at least one of the four-chems (crystal meth, GHB, GBL, mephedrone, UK definition of chemsex) and MSM only using other drugs during sex. By excluding other drugs than the four-chems in the chemsex definition, MSM with a need for help would be missed in health care. Most popular topics to discuss with professionals were increasing self-control, safer use of drugs and reducing the risk of acquiring an STI. Sexual health experts or experts on alcohol and drugs would be the preferred professionals. As STI clinics are a trusted source for MSM to discuss personally sensitive issues (Bourne et al., 2015; Glynn et al., 2018; Knight, 2018; Salway et al., 2019), they could play an important role in delivering prevention and care strategies that address safer sex and drug use, and refer MSM to addiction and mental health care professional when needed. Strengthening connections and knowledge-sharing between STI clinics and addiction and mental health care professionals might be necessary to enable STI clinics to provide adequate information on safer drug use and develop referral pathways.

In assessing whether professional counselling is needed, health care professionals should ask about the following associated topics: frequent chemsex, no recent sober sex, experience of disadvantages and/or a negative change in daily life, and intention to change chemsex behaviours. These topics might indicate that these men are spiralling into the negative consequences of chemsex. As described in a qualitative study, chemsex journeys can spiral from exciting and self-exploratory into feeling out of control, isolation and high-risk behaviour (Smith & Tasker, 2018). The indicators found in our study probably only reflect the signals of problematic chemsex on the surface. As suggested by one study (Pollard et al., 2018), syndemics of HIV, poor mental health, stigmatization, drug use could lead to feelings of loneliness, emptiness, depression, and emotional and sexual inhibition which might be the more deeper underlying facilitators of problematic chemsex. Nevertheless, the indicators found in our study could serve as opening questions to discuss chemsex issues in health care and might be useful for assessing whether professional counselling is needed. One example of evidence-based professional counselling to reduce sexual and drug use risk behaviour among MSM is Motivational Interviewing (Parsons et al., 2014).

STI clinics and other health care professionals should also be aware of unwanted sexual experiences among MSM practicing chemsex. As already showed in other studies (Bourne et al., 2015; Hibbert et al., 2019), unwanted sexual experiences were common among MSM practicing chemsex in our study (19%). Qualitative research showed that the concept of consent was often complicated in a chemsex setting (Bourne et al., 2015). Men who feel they have been a victim of non-consensual sex should be made aware of support and linked to post-exposure prophylaxis for HIV where appropriate.

This study should be viewed in light of some limitations. Most data were retrospectively collected and self-reported, which could have led to recall bias and social desirability bias on potentially stigmatized behaviours, such as admitting one's drug use had a negative impact on one's life and professional help is needed. This might have led to an underestimation of the proportion of MSM indicating a negative life change and a need for professional counselling. Because of the limited number of MSM with a need for professional counselling ($n = 48$), we did not assess independent determinants and only described characteristics of this group. Due to the small number, results should be interpreted carefully. Furthermore, the questionnaire was completed by the high-risk MSM visiting STI clinics, since the median number of sex partners (6 vs. 5, $p = 0.02$) and overall STI positivity (23% vs. 19%, $p = 0.02$) were higher among study participants compared to the total MSM population ($n = 3493$) who visited the participating STI clinics during the study period. This might have led to an overestimation of the proportion of MSM practicing chemsex. Study nurses were explicitly instructed to recruit all MSM regardless of reported chemsex, but we cannot entirely rule out the possibility of sampling bias. We do not have information on chemsex among non-participants and cannot confirm whether there was a sampling bias concerning reported chemsex. However, nurses reported that the absence of recruitment was mainly due to practical reasons, such as lack of time. Therefore, we believe that non-inclusion was random and not based on self-report of sexual risk behaviour or chemsex.

5. Conclusion

The majority of MSM practicing chemsex used drugs to increase the qualities valued in sex and did not experience serious harms of chemsex. Nevertheless, one in four might want to be counselled by a professional on chemsex-related issues. We identified a set of indicative characteristics of MSM with a need for professional counselling ($n = 48$), including frequent chemsex, prolonged time since sober sex, experience of disadvantages and intending to change chemsex behaviour. These topics might be helpful for health care professionals to discuss with MSM to identify their needs for professional counselling.

CRedit authorship contribution statement

Y.J. Evers: Conceptualization, Investigation, Data curation, Resources, Formal analysis, Methodology, Project administration, Visualization, Writing - original draft, Writing - review & editing. **C.J.P.A. Hoebe:** Conceptualization, Methodology, Supervision, Writing - original draft, Writing - review & editing. **N.H.T.M. Dukers-Muijers:** Conceptualization, Methodology, Supervision, Writing - original draft, Writing - review & editing. **C.J.G. Kampman:** Investigation, Resources, Supervision, Writing - original draft, Writing - review & editing. **S. Kuizenga-Wessel:** Investigation, Resources, Writing - original draft, Writing - review & editing. **D. Shilue:** Investigation, Resources, Writing - original draft, Writing - review & editing. **N.C.M. Bakker:** Investigation, Resources, Writing - original draft, Writing - review & editing. **S.M.A.A. Schamp:** Investigation, Resources, Writing - original draft, Writing - review & editing. **H. Van Buel:** . **W.C.J.P.M. Van Der Meijden:** . **G.A.F.S. Van Liere:** Conceptualization, Methodology, Formal analysis, Visualization, Writing - original draft, Writing - review & editing.

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Conflicts of interest statement

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest.

Data availability statement

Interested researchers may contact the head of the data-archiving (Helen Sijstermans: helen.sijstermans@ggz.nl) to receive the data.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2020.101074>.

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