Substance Use and Sex Index (SUSI): First stage development of an assessment tool to measure behaviour change in sexualised drug use for substance use treatment studies

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ARTICLE INFO

ABSTRACT

Background: Existing tools for measuring blood-borne virus (BBV) and sexually transmitted infection (STI) transmission risk behaviours in substance use interventions have limited capacity to assess risk behaviours across varied social, cultural and epidemiological contexts; have not evolved alongside HIV treatment and prevention innovations; or accounted for sexual contexts of drug use including among a range of lesbian, gay, bisexual, transgender, intersex and queer (LGBTIQ) sub-communities. The Substance Use and Sex Index (SUSI) is a new brief, simple tool being developed to assess change in HIV and STI risk behaviours for substance use treatment studies.

Methods: A 26-item questionnaire was piloted online among community volunteers (n = 199). Concurrent and predictive validity were assessed against risk-taking (RT-18) and STI testing items (Gay Community Periodic Surveys).

Results: The developed scale comprised nine items measuring: condomless penile (anal or vaginal) sex, unprotected oral sex, shared toy use, bloodplay, chemsex (consumption of drugs for the facilitation of sex), trading sex for drugs, being 'too out of it' to protect self, injecting risk and group sex. Factor-analytic approaches demonstrated that items met good fit criteria for a single scale. Significant, moderate magnitude, positive relationships were identified between total SUSI score and both RT-18 risk-taking and recent STI testing. Qualitative feedback underscored the importance of culturally-embedded question formulation.

Conclusion: The results support the conceptual basis for the instrument, highlighting the need for further scale content refinement to validate the tool and examine sensitivity to change. SUSI is a step towards improving outcome measurement of HIV/BBV/STI transmission risk behaviours in substance use treatment studies with greater inclusiveness of experiences across different population groups.

Background

Substance use treatment studies often seek to determine the impact on secondary outcomes associated with substance use – such as transmission of HIV, blood-borne viruses (BBVs) and other sexually transmitted infections (STIs) – however there are some limitations in the capacity of existing tools to measure these risks reliably (Dowling-Guyer et al., 1994). The Opiate Treatment Index HIV Risk-taking Behaviour subscale (OTI-HRBS) (Darke, Ward, Hall, Heather, & Wodak, 1991) is one such tool used in general population studies to measure

HIV/STI transmission risk behaviours in the context of substance use. However, while short and simple to administer, its focus on HIV transmission risk associated with opioid use limits its ability to assess a range of other transmission risk behaviours. Examples of questions in the OTI-HRBS include: "Before using needles again, how often in the last month did you use bleach to clean them?" and "How many times have you had anal sex in the past month (maximum > 10)". Such items are indicative of the general need for an updated measure in order to account for current sexual contexts and HIV prevention innovations.

Other scales, such as the Safer Sex Behavior Questionnaire (SSBQ) (DiIorio, Parsons, Lehr, Adame, & Carlone, 1992), have not evolved alongside HIV treatment and prevention innovations, nor adequately capture the range of behaviours in current sexual contexts (including sexual contexts of drug use). Questions used in the SSBQ include: "I ask my potential sexual partners about a history of bisexual/homosexual practices" and "I engage in sexual intercourse on a first date". Such tools have limitations in their applicability to different populations and are rarely used in published data on sexual risk behaviour among LGBTIQ people.

Although neither drug use nor sexual behaviour is considered inherently 'risky', their relationship with HIV/BBV/STI transmission risk has been well documented. Associations have been found and replicated in a number of studies internationally, for example, between sexual risk behaviours and use of illicit drugs among men who have sex with men (MSM) (Forrest et al., 2010); methamphetamine use and increased transmission risk for STIs among MSM (Vaudrey et al., 2007); recreational drug use and condomless sex between serodiscordant partners among HIV-positive MSM (Rodger et al., 2015); and alcohol use and sexual risk behaviours among male and female migrant populations (Bello et al., 2017).

The literature documenting the correlates of substance use and sexual risk behaviours is comprehensive, however there is no standardised measure available for their assessment. The Substance Use and Sex Index (SUSI) is a tool being developed with the primary aim of measuring change in self-reported HIV/BBV/STI transmission risk behaviours for use in substance use treatment studies, attempting to account for different and emerging social, cultural and epidemiological contexts within which substance use and sexual activity co-occur. The specific aims in formulating the SUSI scale were to:

- develop a series of items relating to risk that apply to a range of sexual practices,
- determine if these items measure what they purport to measure, and
- determine if this scale is associated with other known relevant measures of risk-taking attitudes and behaviours.

The purpose of developing a valid, brief assessment tool is to expand clinical capacity for assessing sex and drug use risk behaviours, to inform clinical practice regarding treatment efficacy for substance use disorders, and to ultimately contribute to reductions in HIV/BBV/STI transmission. This paper reports on the testing phase of the SUSI piloted scale (version 1) carried out in 2016. Results from the pilot will inform the refinement of SUSI (version 2) anticipated to occur in 2018.

Methods

A literature review was conducted to identify content themes across different assessment tools used to measure sexual risk behaviour. Relevant academic literature was searched using ProQuest, PsycINFO and PubMed databases, with the search terms: *assessing sexual risk, risky sex behaviour, sexual risk behaviour, assessing sexual behaviour, chemsex, HIV risk behaviour*, and *HIV risk assessment.* The same terms were used in an online search for grey literature.

Ten questionnaire assessment tools were identified via the literature review (Appendix A in Supplementary data), with items in each scale reviewed by the research team for relevance and common content

themes across the different scales identified (Appendix B in Supplementary data). Proposed items for the SUSI questionnaire were initially drafted based on language used in the identified tools and refined in consultation with an addiction medicine/sexual health specialist.

A 26-item version of the SUSI was piloted online (Appendix C in Supplementary data). Eligibility criteria for participation in the questionnaire were broad (i.e. people living in Australia who are aged 18 years and over) to ensure clinical utility of the tool across different populations and substance use interventions. Participants were recruited through Facebook and Recon, a 'hook-up' app/website aimed principally at gay and bisexual men who are interested in fetishes. This convenience sample captured a range of sexual practices and transmission risk behaviours. Incentives were provided to participants through a prize draw to win one of three $100 music vouchers upon submission of the questionnaire, which took approximately 5–10 min to complete. Data were collected using Lime Survey.

Predictive and concurrent validity of the SUSI scale were assessed by analysing the relationships of the newly-formed SUSI scale for sexual risk-taking with validated measures of generalised behavioural risk-taking through the RT-18 Risk Taking Questionnaire (de Haan et al., 2011) as well as self-reported STI testing and diagnosis through the relevant section of the Gay Community Periodic Surveys (GCPS) (Holt et al., 2017). The online questionnaire therefore incorporated items from the two validated measures. Predictive and concurrent validity were measured through regression analyses using the latent SUSI factor (Appendix D in Supplementary data). Confirmatory factor analysis assessed the relationship of scale items to the single underlying construct of sexual risk-taking (Appendix D in Supplementary data). Establishing this relationship provided grounds to suggest that summation of risk scores is indicative of an overall perception of risk. Regression and confirmatory factor analyses were conducted in Mplus 8.0.

The online questionnaire featured a free text section for participant feedback. Qualitative data were analysed by the research team and illustrative comments were selected to highlight emerging themes. Content validity was assessed through participant feedback and expert review facilitated by the study investigators.

The research was approved by the University of Tasmania Human Research Ethics Committee (HREC #H0015180).

Results

A total of 316 questionnaires were submitted online and received by the research team; 117 questionnaires received were ineligible due to partial completion (none of the scale items: n = 108), fake responses (n = 1) and blank cases (n = 8). Complete responses were obtained from 199 people: 63 identified as cisgender female, 105 as cisgender male, 2 as transgender male, and 27 did not specify gender.

Following expert review of questionnaire responses and content review of risk assessment, several items were combined to create nine risk items: condomless penile (anal or vaginal) sex, unprotected oral sex, shared toy use, bloodplay, chemsex (i.e. the consumption of drugs for the facilitation of sex, also known as "party 'n' play" or "PnP"), trading sex for drugs, being 'too out of it' to protect self, injecting risk, and group sex. This yielded a risk scale with a range of 0–15 with higher scores inferring greater engagement in risk. Most of the SUSI items were well correlated. Confirmatory factor analysis of the scale demonstrated strong item loadings and excellent fit of the items to a single underlying factor. Regression analyses indicated that the SUSI scale was strongly and positively related to the validated external measures used for assessment. Details of the analysis are provided in Appendix D in Supplementary data.

Participants provided feedback on the clarity and appropriateness of specific questions/content themes and on the tool more generally, noting that the questionnaire is "non-judgmental and respectful" and "clear and well understood". Content analysis of participant feedback

also identified challenges regarding conceptualisation of risk, particularly in the context of current pre-exposure prophylaxis (PrEP) strategies for HIV. Feedback mainly related to items in which "unprotected sex" had been defined as sex without a condom, and in relation to using drugs in sexual contexts.

> "I think the conflation of unprotected sex as meaning only no condom is unclear. I understand that protected sex could also include a range of other strategies, such as if the person was on treatment and undetectable for HIV, if I was on PrEP, or if we'd discussed HIV/STI status first."

> "I feel like this question [on being too 'out of it'] got confusing because it conflated together into one question being out of it, protecting oneself and doing things you wouldn't normally do when sober."

The importance of using inclusive language and formulating culturally-embedded questions, particularly around gender/sexual identity and drug use, was underscored.

> "The only caution I would offer is that some transfolks still use these words [penis and vagina] to refer to their anatomy … e.g. I refer to my testosterone enlarged clitoris as a cock."

> "I personally believe that from the questions asked in the survey that you try to make others perceive drug users as these extreme risk takers [which is] an incorrect stereotype."

To improve the tool's ability to detect blood-borne virus transmission risk behaviours, participants indicated their preference for separating 'fisting' from the question relating to 'bloodplay' which had been collapsed into one question in the interest of questionnaire brevity.

> "I don't think of [fisting] as bloodplay … [i]t is a reasonably safe practice with gloves. I think you should keep fisting as a separate sexual behaviour."

> "[Blood] is not the aim of fisting, in contrast to cutting or scarification etc."

Discussion

Findings from the pilot demonstrate the breadth of conceptualisation of risk among a range of sex and gender diverse populations in Australia in the context of emerging HIV treatment and prevention innovations. Although previous scales have considered total number of sexual partners to be a risk factor, this was not included in the SUSI risk items due to limited evidence of its relationship with transmission risk (Centers for Disease Control and Prevention, 2000). The items have been retained in the general questionnaire to assist in recall for the other risk items, as well as for their potential utility in the development of clinical interventions for people engaging in behaviours associated with HIV and STI transmission risks.

Data on sexual identity and demographic information were not collected as SUSI is intended for incorporation within broader questionnaires used in substance use treatment studies where identity/demographic questions are already included. Future versions of SUSI will include sexual identity and demographic questions for validation study purposes. Items on serosorting and other seroadaptive behaviours were also not included in the scale as modelling suggests serosorting in casual sex settings with high rates of undiagnosed HIV is insufficient for preventing HIV transmission (Jin et al., 2015). Continuing refinement of SUSI will include items reflecting developments in the conceptualisation of HIV transmission risk, such as PrEP and undetectable viral load which may be pertinent in chemsex settings (Jin et al., 2015; Kesler et al., 2016). Transmission risk for other STIs and their association with chemsex settings would support condom use items remaining in the scale (Hegazi et al., 2016).

Double counting of sexual partners in the piloted tool may have occurred if people had vaginal and anal sex with the same person. Accounting also for the different levels of HIV transmission risk posed by vaginal and anal sex (Varghese, Maher, Peterman, Branson, & Steketee, 2001), the wording of these items may have implications on study findings and will be revised in subsequent iterations of SUSI. Some participants may have underreported their total number of condomless partners and overreported the number of condomless partners with unknown HIV status due to the latter being reported as higher than the former on a number of occasions.

The inclusion of STI testing questions from the GCPS in the SUSI pilot contributed to the measurement of predictive and concurrent validity. Although the correlation between STI testing behaviour and self-perceived sexual risk behaviour is imperfect, the benefit of including GCPS items over questions in other scales was due to their item independence, that is, items in existing scales measuring sexual risk would have a degree of content overlap with SUSI that would likely have resulted in an overestimate of content validity.

Ensuring the acceptability and appropriateness of language is an important consideration in the ongoing refinement of the tool. This was underscored by the qualitative findings particularly in relation to ensuring inclusive and appropriate wording when asking questions relating to gender and sexual orientation, avoiding the reinforcement of stigmatising risk discourses when asking questions relating to drug use and ensuring accuracy and clarity of meaning when asking questions relating to sexual practices. Indeed, the importance of using appropriate, relevant and easily understood language cannot be overstated as it bears influence on willingness to participate and on the provision of accurate and reliable responses to questions of a sensitive nature (Fenton, Johnson, McManus, & Erens, 2001). Challenges may arise when using language that might be appropriate and relevant for some population groups but is not necessarily relevant or appropriate for other groups; additionally, balance needs to be sought between the adoption of inclusive language for a variety of population groups and the maintenance of brevity with questions and the questionnaire overall. The relevance and appropriateness of certain terminologies will likely change over time and therefore another challenge is to continually keep the tool updated. On this note, future developments of the SUSI scale will have to be undertaken with close and regular community consultation. Nevertheless, the tool will remain context-specific to Australia, with questionnaire content adapted for use in other contexts.

Designing sexual risk assessment tools that are brief, relevant and appropriate across different population groups, customs and practices would improve accuracy of risk behaviour measurement (Fenton et al., 2001; Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998). Developing a tool that perfectly accounts for a myriad of social, cultural and epidemiological contexts, however, is an inherent challenge. As different patterns of substance use emerge over time, any scale seeking to measure risk needs to be regularly reviewed for relevance to changing patterns of sexual contexts of drug use and evolving HIV/BBV/STI treatment and prevention strategies. Moreover, challenges exist in developing a tool that is culturally sensitive to all communities; that takes into account the varied ways that different sub-populations and cultures conceptualise and discuss sexual practices and substance use; and that aims to be inclusive of all genders and sexual orientations by taking into account the nuances and complexities of language around sex and drug use. These issues become much more challenging when balancing the need for brevity to enhance the tool's clinical utility.

Further scale content refinement to validate the tool and examine sensitivity to change will assist in addressing some of these challenges and improving future utility of SUSI. A validation study of the refined scale is planned to determine scale structure using a broad population sample, using confirmatory factor analysis and determine consistency of scale performance in a population sample that includes a diverse range of respondents (including trans and gender diverse people, gay and bisexual men, same sex attracted women, heterosexual men and

women) and testing against the OTI-HRBS risk questionnaire; determine appropriate item scaling using Item Response Theory Approaches; and determine test-retest reliability over time so that reliable clinical change data can be calculated using the scale.

Conclusion

In light of evolving sexual practices in the context of drug taking and innovations in HIV/BBV/STI prevention and treatment, a measurement tool that is sensitive to change is required for clinical research aimed at reducing risk. The development of such a tool needs to be cognisant of the pitfalls of reducing a complex social behaviour into a simple number, and the dangers of reinforcing stigma when working with populations that have frequently been marginalised.

While no tool can perfectly measure HIV/BBV/STI risk in all contexts, SUSI is a step towards improving clinical capacity to assess self-reported behaviour change associated with known transmission risk behaviours among different populations across a range of contexts. Such a tool is required for the improved measurement of sexual risk behaviour change in the context of substance use treatment trials, where changes in sexual risk behaviours have often been measured as secondary outcomes (compared with changes in substance use consumption as a primary outcome). Short and simple to administer, SUSI has the potential to measure changes in sexual risk behaviour as important outcomes in their own right, thereby contributing to improved clinical identification of risk behaviours relevant to sexual health across populations including LGBTIQ people. Further refinement and validation of the scale is required.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.drugpo.2018.03.020.

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