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Substance use in the emergency department: Screening for risky drug use, using the ASSIST-Lite

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Abstract

Introduction: Substance use is a common contributing factor to emergency department (ED) presentations. While screening, brief intervention, and referral to treatment for alcohol and tobacco is common in ED settings, it is not routinely conducted for illicit substances. This study aimed to deploy the ASSIST-Lite to screen for risky use of alcohol and other drugs in the ED, to identify differences in risk based on between demographic characteristics.

Method: All ED attenders, aged 18 years or older, deemed well enough to participate were approached. Recruitment occurred at the Royal Adelaide Hospital ED between May and June 2017. Participants were asked to self-complete the ASSIST-Lite in the ED waiting room. Overall, 632 people were approached, of which 479 (75.8%) agreed to participate.

Results: Alcohol (72.2%), tobacco (27.1%) and cannabis (15.2%) were most commonly reported. Eighty-nine participants reported moderate- or high-risk use of two substances, and a further 49 individuals reported moderate- or high-risk use of three or more substances. Across most substances, age, gender and employment status was associated with risky substance use, with higher likelihood of risk reported by males, unemployed and younger participants. Unemployment was also significantly associated with increased risk severity for both moderate and high-risk illicit use.

Discussions and Conclusions: The rate of risky illicit and polysubstance use found here highlight the need more focused research in ED settings. The findings also provide support for more routine screening, and early intervention approaches; and suggest the need for active referral pathways through an alcohol and other drug consultation liaison service.

KEYWORDS
ASSIST-Lite, emergency department, SBIRT, substance use

1 | INTRODUCTION

Hospital emergency departments (ED) are purpose-built to provide medical care and attention to individuals with serious injury, trauma and illness. Intoxication and long-term substance use increases the risk of these afflictions, and therefore presentation to EDs may often be associated with substance use [1]. Individuals attending hospital EDs with substance-related presentations are also likely to have previously had multiple encounters with primary and acute health services [2, 3], making EDs an ideal place to identify and respond to risky substance use [4, 5].

Prevention and early intervention approaches help to reduce the risk of harm to the individual. In primary health settings, targeted screening, brief intervention and referral to treatment (SBIRT) is a stepped-care framework designed to identify risk of harm, encourage behavioural change and connect higher-risk cases to further specialist assessment [6]. At low- and moderate-risk levels, application of screening and/or a brief intervention has been shown to be effective in reducing risk of harm for substance use disorders in primary health settings [7]. In ED settings, preventive approaches like SBIRT have the potential to facilitate management and discharge of some patients, and may reduce the likelihood of future repeated presentations [8–10]. Despite this, however, to date the application of SBIRT methodologies for substances other alcohol and tobacco has been limited [11].

Higher rates of illicit substance use are common in ED settings, and the limited capacity of ED staff to identify and intervene for illicit substance use is a cause for concern. Findings from the designer drug early warning system (D2EWS) project at the Royal Adelaide Hospital found a significant rate of illicit substance use among ED presenters, and recommended future investigations to better understand the relationships between illicit use and presentation to the ED [12]. In this context, there is a need to better understand both the level of illicit and polysubstance-use that is involved in ED presentations; and to identify possible populations where SBIRT might be applied to reduce the further risk of harm.

In the general population, illicit substance use also appears to be on the rise. According to the 2019 Australian National Drug Strategy Household Survey, the prevalence of previous 12-month use of cocaine, cannabis and ecstasy has increased from 2016 [13]. While national rates of methamphetamine use have steadily decreased to 1.2% since its peak of 3.6% in 2001, a greater proportion report using more potent crystal methamphetamine and using more frequently. The same survey found over half of the individuals who reported methamphetamine use were using at levels that would be considered moderately risky [13], and would be optimal targets for a brief intervention.

1.1 | ASSIST-Lite

In line with Rose's [14] population strategy, SBIRT may help reduce the public health burden, by reducing the number of individuals at low-to-moderate-risk from re-presenting with problems exacerbated by an escalating use. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) is a World Health Organization endorsed SBIRT framework for the identification and early intervention for substance use disorders [15]. The ASSIST-Lite is a shortened version of the instrument that was designed for rapid turnover settings. However, despite being validated in the general population [16], it has yet to be trailed in rapid turnover settings. Although an optimal approach to identifying substance use among presenters would involve an objective measure (e.g., urine or oral fluid sample), such an approach is not always feasible. Therefore, self-report screening questionnaires are more common. To that end, ASSIST-Lite presents an advantage over other screening questionnaires in ED settings, for several reasons.

First, ASSIST-Lite screens for all common drugs, both licit and illicit. Typically, multiple substances will be screened for using separate measures. For example, while alcohol might be screened for using a version of the Alcohol Use Disorders Identification Test [17]; other drug use must be screened for using a separate test (e.g., Drug Use Disorders Identification Test [18]). Notwithstanding the fact that instruments such as the Drug Use Disorders Identification Test are incapable of identifying polysubstance use, the use of multiple screening questionnaires presents inefficiencies that limit likelihood of uptake in rapid-turnover settings. ASSIST-Lite mitigates this risk by screening for all substances at the same time, significantly reducing the time required to complete.

Second, ASSIST-Lite can be self-completed anonymously, meaning responses are less susceptible to biased reporting. A preference for self-completion has been found in ED settings [19], and self-completion may help increase reliability of reporting compared to therapist-administered questionnaires, by addressing issues of stigma, and the perception of legal ramifications for disclosure of illicit drug use [20–22]. ASSIST-Lite also focuses exclusively on the previous 3-month window, which reduces the risk of memory recall biases compared to screens of a longer duration. Recency also enhances the salience of any intervention.

Third, ASSIST-Lite is designed to provide tailored feedback about reducing risk. The feedback is targeted

for moderate-risk use across the drugs the individual reportedly consumes, while higher-level of risk requires referral to specialist treatment for further assessment. A recent study has shown faster screening and targeted brief advice for moderate-risk may have similar effectiveness as more intense interventions [23], which is invaluable given the time and resource constraints in ED settings. In addition, self-completed digital SBIRT overcomes limitations on staff knowledge and any potential stigmatic attitudes towards substance-related presentations [24–27].

1.2 | This study

To date, limited research has focused on identifying rates of illicit and polysubstance use among ED presentations [28]. The aims of this study were two-fold. First, to describe the licit and illicit, single and polysubstance-related risk profile of ED presenters using ASSIST-Lite. Second, to examine associations between basic demographic characteristics and levels of risky substance use. The findings from this research may help to inform ED medical and executive staff about how to recognise and address problematic substance-related presentations to reduce the future risk of harm and re-presentation.

2 | METHOD

2.1 | Recruitment

This paper presents the results of a cross-sectional investigation of severity of risk of substance-related harm among a sample of ED presenters. The data were collected during a pilot of the ASSIST-Lite instrument in a large, inner-city hospital ED in Adelaide, South Australia.

Prior to commencement, all ED staff were briefed on study purpose, design and patient eligibility. All ED attenders aged 18 years or older, identified by ED triage staff as 'well enough' to participate were eligible. Consequently, minors, those visibly intoxicated or those presenting involuntarily and in-need or urgent care were excluded. Though this limited the number of eligible participants, these criteria avoided complex legal issues of capacity to provide informed consent, and ethical considerations around interfering in emergency triage processes. Eligible participants were not compensated for their participation.

A total of 632 people were approached, of which 479 (75.8%) agreed to participate. Ethics approval was obtained from the Central Adelaide Local Health Network Human Research Ethics Committee (Approval number HREC/17/RAH/120). Recruitment occurred at the Royal Adelaide Hospital ED, Thursday to Sunday nights, between 6 pm and midnight, across five weekends from 5 May to 3 June 2017. The recruitment window (i.e., weekend evenings) was selected to capture the greatest likelihood of substance-related presentations.

2.2 | Procedure

Prior to commencement, the medical student research associates were briefed on study requirements. During recruitment, research associates approached potential participants, provided study information and obtained written consent. Participants were then handed a computer tablet and asked to self-complete the survey, which included basic demographic information (age, gender, employment status) and the ASSIST-Lite questionnaire. Participants received their results stratified by risk severity (i.e., low, moderate or high) for each substance, and the substance-appropriate advice was displayed on screen. For those in the moderate-risk range, brief advice on risk reduction strategies for each substance was given by the application. Brief advice in this context is distinct from a brief intervention [29], the definition of which can vary across jurisdictions and health-care settings. For those with high-risk scores, the brief advice also included the need to seek further help. As a source of referral to treatment, the Alcohol and Drug Information Service (ADIS) phone number was provided. A message reiterating that assessment results would not be included in hospital records was displayed, but participants were advised of their option to discuss results with hospital staff. No data was extracted from hospital records and the results of screening were not included in the patient's hospital records.

2.3 | Measures

The ASSIST-Lite is a seven-item screen that assesses substance-use risk across seven drugs/drug classes (nicotine, alcohol, cannabis, stimulants, sedatives, opioids and any other psychoactive substances). For each substance, respondents are asked an initial screening question related to the previous three-month window (e.g., 'Did you use cannabis?'), to which each item receives a dichotomous (yes/no) response. If respondents answer affirmatively, two follow-up questions (three, in the case of alcohol) are presented. Each affirmative response is given a score of 1. Thus, an individual can score between zero and three for all substances (except alcohol [0–4]).

For all substances except alcohol, low-risk is a score of zero, moderate-risk a score of one or two, and high-risk a score of three. For alcohol, low-risk is a score of zero or one; moderate-risk is a score of two and high-risk is a score of three or four.

2.4 | Analyses

Non-parametric tests assessed between-group differences for risk of each substance across gender, employment status (i.e., unemployed vs employed) and type (i.e., unemployed, student, part-time/casual, home duties, full-time). Spearman's rank order correlations assessed associations between polysubstance risk ratings. Multinomial logistic regression models examined associations between demographic characteristics and risky substance use. For the primary model, participants scoring moderate- or high-risk use were combined, to form a single 'risky' group, and were then compared to those recording low/no-risk use (e.g., 'low-risk') for each substance. For the secondary model, any moderate-risk illicit use and any high-risk illicit use were assessed according to age, gender and employment status. In the case of multiple entries for the same participant (i.e., repeated visits to the ED), only the first completed assessment was included in analyses; subsequent assessments were to be used for validation purposes but excluded from analysis. There were no missing data in this study.

3 | RESULTS

Table 1 presents the demographic descriptive characteristics of participants. Overall, 632 people were approached, of which 479 (75.8%) agreed to participate. All 479 participants completed the screen and received brief advice. Overall, 72.2% of participants reported some level of alcohol consumption in the previous 3-months, with lesser proportions of participants reporting use of tobacco (27.1%), cannabis (15.2%), stimulants (8.2%) or sedatives (5.5%). Opioids (either street or prescription opioids used in a way not intended by the prescriber) were least commonly reported (2.1%).

In terms of risk, 180 participants (37.6%) reported no risky use, with the remaining 299 individuals (62.4%) reporting some level of moderate- and/or high-risk use. Moderate-risk of at-least one substance (but no high-risk use) was indicated by 194 individuals (40.5% of total), and 105 individuals (21.9% of total) reported high-risk use for at least one substance. In terms of severity, 41% rated moderate- and 22% rated high-risk use as their most severe level; with 16% doing so for an illicit substance. Moderate-risk single-substance use was most common, with a total of 130 participants (27%) reporting moderate-risk use for one substance; and over 90% of the individuals rating moderate-risk for an illicit substance, did so for a single substance. Overall, 77 individuals scored moderate-risk for an illicit substance. Of the 105 individuals scoring at least one high-risk rating, 24 participants did so for at-least one illicit substance. At both moderate- and high-risk levels, cannabis and stimulants (e.g., methamphetamine) were the most common illicit substances reported.

In total, 89 individuals reported moderate- or high-risk use of two substances, most frequently involving a combination of either alcohol, tobacco or cannabis. However, eight individuals had moderate-risk stimulant consumption in combination with either alcohol or tobacco. Forty-nine individuals had moderate- or high-risk consumption for three or more substances, of which 33 (67%) indicated risky use of stimulants (e.g., methamphetamine).

Table 2 presents the associations between severity of risk between each substance, as well as associations between risk severity and demographic predictors for each substance. Risk ratings for stimulants were moderately correlated with several other substances, including cannabis ($r_\rho = 0.46$), opioids ($r_\rho = 0.39$), tobacco ($r_\rho = 0.33$) and sedatives ($r_\rho = 0.33$); and weakly correlated with alcohol ($r_\rho = 0.13$). Tobacco was moderately

TABLE 1 Participant demographic characteristics

Variable	*N* (%)
Age, years	-
18–19	38 (7.9)
20–29	159 (33.2)
30–39	90 (18.8)
40–49	82 (17.1)
50–59	69 (14.4)
60–69	23 (4.8)
70–79	17 (3.5)
80+	1 (0.2)
Mean (SD)	37.1 (14.8)
Gender	-
Female	238 (49.7)
Male	241 (50.3)
Employment	-
Unemployed	92 (19.2)
Student	60 (12.5)
Part-time/casual	108 (22.5)
Home duties	20 (4.2)
Full-time	199 (41.5)

Note: $N = 479$.

TABLE 2 Spearman's rho correlations between substance risk and predictor variables

	Tobacco	Alcohol	Cannabis	Stimulants	Sedatives	Opioids	Gender	Employment
Alcohol	**0.15**	–						
Cannabis	**0.40**	**0.19**	–					
Stimulants	**0.33**	**0.13**	**0.46**	–				
Sedatives	**0.12**	0.06	**0.19**	**0.33**	–			
Opioids	**0.17**	0.03	**0.22**	**0.39**	**0.42**	–		
Gender	**−0.10**	**−0.14**	−0.02	**−0.11**	0.01	0.03	–	
Employment	**0.17**	−0.02	0.03	**0.12**	0.07	0.05	**−0.19**	–
Age	−0.07	**−0.18**	**−0.15**	−0.09	0.05	0.05	0.00	**0.32**

Note: $N = 479$. Bold values indicate significant associations ($p < 0.05$).

correlated with cannabis ($r_\rho = 0.40$), and opioid and sedative risks were also moderately correlated ($r_\rho = 0.42$).

3.1 | Demographic predictors

3.1.1 | Gender

Table 3 presents a summary of the risk ratings and tests of association according to each risk level and gender. Gender differences across substance risk were assessed using Mann–Whitney *U*-tests of association. Results found significantly higher risk ratings among males for tobacco ($U(2) = 26{,}090$, $p = 0.029$, $\eta^2 = 0.01$, $r_\rho = 0.10$), alcohol ($U(2) = 24{,}200$, $p = 0.002$, $\eta^2 = 0.02$, $r_\rho = 0.14$) and stimulants ($U(2) = 26{,}937$, $p = 0.018$, $\eta^2 = 0.01$, $r_\rho = 0.11$). No significant differences were found for cannabis ($p = 0.612$), sedatives ($p = 0.838$) and opioids ($p = 0.507$).

3.1.2 | Employment type

Differences in substance-specific risk severity across employment type were assessed using Kruskal–Wallis *H*-tests of association. Overall results showed significant group differences in risk for tobacco ($H(4) = 40.6$, $p < 0.001$), alcohol ($H(4) = 34.2$, $p < 0.001$) and stimulants ($H(4) = 10.8$, $p = 0.030$); but not for the remaining substances.

3.2 | Regression models

3.2.1 | Risky use

Table 4 presents the results from the primary multinomial logistic regression model which assessed the likelihood of risky substance use (i.e., no/low-risk vs. moderate/high-risk) for all substances according to age, gender and employment status. When controlling for age and employment status, the likelihood of risky use of alcohol and stimulant use was around two times higher for males, but no significant differences were found between genders for tobacco. The likelihood of risky use decreased with age for tobacco (odds ratio 0.97, confidence interval [0.95, 0.98], $p < 0.001$), alcohol (odds ratio 0.97, confidence interval [0.95, 0.98], $p < 0.001$), cannabis (odds ratio 0.96, confidence interval [0.94, 0.98], $p < 0.001$) and stimulants (odds ratio 0.96, confidence interval [0.93, 0.99], $p = 0.004$). Non-significant decreases were observed for sedatives and opioids. With respect to employment status, significant differences were found between the likelihood of risky use for unemployed individuals across the majority of substances. Unemployment was associated with significantly increased likelihoods of risky tobacco (5.2-times), opioid (4.6-times), stimulant (2.9-times) and cannabis (1.9-times) use compared to employed individuals.

Table 4 also presents the likelihood of risky use according to type of employment. Controlling for gender and age, employment type was significantly associated with risk severity for all drugs (except sedatives). Compared with full-time workers, unemployed individuals were less likely (0.5 times) to report risky alcohol use, but were 11 times more likely to report risky opioid use, 6 times more likely to report risky tobacco and 2 times more likely to report risky stimulant use. Unemployed individuals also had an increased likelihood of risky use of tobacco and stimulants compared to students and part-time workers. Unemployed individuals also had greater likelihood of risky cannabis use than students. There was insufficient data to determine whether home-duties differed on risks. All other employment comparisons were non-significant (see Table 4).

TABLE 3 Overall substance use characteristics for each drug by gender and employment, with respective non-parametric tests of association

			Gender				Employment						
					Mann–Whitney *U* test							Kruskal–Wallis *H* test	
Substance	**Risk**	**Overall** *N* (%)	**Female** *N* (%)	**Male** *N* (%)	***U***	***p***	**Unemployed** *N* (%)	**Student** *N* (%)	**Casual/part-time** *N* (%)	**Home duties** *N* (%)	**Full-time** *N* (%)	***H***	***p***
Tobacco	Low	349 (73)	184 (77)	165 (69)	**26089.5**	**0.029**	44 (48)	45 (75)	83 (76)	15 (75)	162 (81)	**40.55**	**<0.001**
	Mod.	69 (14)	30 (13)	39 (16)			24 (26)	11 (18)	11 (10)	2 (10)	21 (11)		
	High	61 (13)	24 (10)	37 (15)			24 (26)	4 (7)	14 (13)	3 (15)	16 (8)		
Alcohol	Low	238 (50)	136 (57)	102 (42)	**24199.5**	**0.002**	55 (60)	21 (35)	66 (61)	18 (90)	78 (40)	**34.24**	**<0.001**
	Mod.	187 (39)	81 (34)	106 (44)			24 (26)	32 (53)	31 (28)	2 (10)	98 (49)		
	High	54 (11)	21 (9)	33 (14)			13 (14)	7 (11.7)	11 (10)	0 (0)	23 (11)		
Cannabis	Low	406 (84)	203 (85)	203 (84)	28199.5	0.612	74 (81)	50 (83)	93 (86)	17 (85)	172 (87)	2.08	0.721
	Mod.	61 (13)	31 (13)	30 (12)			16 (17)	8 (13)	11 (10)	3 (15)	23 (11)		
	High	12 (3)	4 (2)	8 (4)			2 (2)	2 (3)	4 (3)	0 (0)	4 (2)		
Stimulants	Low	438 (91)	225 (94)	213 (88)	**26936.5**	**0.018**	78 (85)	55 (91)	104 (97)	20 (100)	181 (92)	**10.75**	**0.030**
	Mod.	31 (7)	9 (4)	22 (9)			9 (10)	4 (7)	3 (3)	0 (0)	15 (7)		
	High	10 (2)	4 (2)	6 (3)			5 (5)	1 (2)	1 (0)	0 (0)	3 (1)		
Sedatives	Low	452 (94)	224 (94)	228 (95)	28803.0	0.838	83 (90)	57 (95)	104 (97)	19 (95)	189 (95)	3.89	0.421
	Mod.	22 (5)	12 (5)	10 (4)			7 (7)	1 (2)	3 (2)	1 (5)	10 (5)		
	High	5 (1)	2 (1)	3 (1)			2 (3)	2 (3)	1 (1)	0 (0)	0 (0)		
Opioids	Low	469 (98)	232 (7)	237 (98)	28928.0	0.507	87 (94)	59 (98)	105 (97)	20 (100)	198 (100)	8.20	0.085
	Mod.	4 (1)	2 (1)	2 (1)			2 (2)	0 (0)	2 (2)	0 (0)	0 (0)		
	High	6 (1)	4 (2)	2 (1)			3 (3)	1 (2)	1 (1)	0 (0)	1 (0)		

Note: $N = 479$. Bold values indicate significant differences groups across risk ($p < 0.05$).
Abbreviation: Mod, moderate.

TABLE 4 Multinomial regression model comparing the likelihood of risky substance use classification according to age, gender, employment status and type

Predictor	Tobacco $N = 479$ AOR (95% CI)	Alcohol $N = 479$ AOR (95% CI)	Cannabis $N = 479$ AOR (95% CI)	Stimulants $N = 479$ AOR (95% CI)	Sedatives $N = 479$ AOR (95% CI)	Opioids $N = 479$ AOR (95% CI)
Age	**0.97 (0.95, 0.98)**	**0.97 (0.95, 0.98)**	**0.96 (0.94, 0.98)**	**0.96 (0.93, 0.99)**	1.02 (0.99, 1.04)	1.01 (0.97, 1.05)
Gender	–	–	–	–	–	–
Female	1.00	1.00	1.00	1.00	1.00	1.00
Male	1.48 (0.94, 2.23)	**1.93 (1.33, 2.82)**	1.06 (0.63, 1.77)	**2.22 (1.11, 4.46)**	0.85 (0.39, 1.87)	0.56 (0.15, 2.02)
Employment status	–	–	–	–	–	–
Employed	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	**5.15 (3.07, 8.63)**	0.67 (0.41, 1.10)	**1.86 (1.01, 3.43)**	**2.90 (1.41, 5.98)**	2.06 (0.87, 4.91)	**4.64 (1.23, 17.00)**
Employment type[a]	–	–	–	–	–	–
Unemployed	1.00	1.00	1.00	1.00	1.00	1.00
Student	**6.12 (2.74, 13.71)**	0.61 (0.29, 1.28)	**2.57 (1.02, 6.45)**	**3.69 (1.15, 11.85)**	1.55 (0.35, 6.94)	3.28 (0.31, 3.19)
Part-time/casual	**4.22 (2.21, 8.06)**	1.12 (0.61, 2.04)	1.83 (0.84, 3.99)	**5.13 (1.58, 16.63)**	2.71 (0.78, 9.42)	2.19 (0.48, 2.08)
Home duties	2.48 (0.79, 7.73)	4.36 (0.96, 21.35)	1.08 (0.27, 4.37)	[b]	2.40 (0.28, 20.65)	[b]
Full-time	**6.03 (3.40, 10.71)**	**0.48 (0.29, 0.80)**	1.80 (0.92, 3.53)	**2.15 (1.02, 4.62)**	1.89 (0.73, 4.91)	**11.10 (1.26, 97.46)**

Note: Bold values indicate significant differences compared to reference group ($p < 0.05$). OR values indicate likelihood of risky use compared to reference categories (signified by values of 1.00).
Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.
[a]Employment type is inversely scored (i.e., odds ratio values indicate likelihood of low-risk use compared to unemployed [referent category]).
[b]Insufficient cases for comparison.

TABLE 5 Multinomial regression model assessing likelihood of any moderate- or high-risk illicit substance use according to age, gender and employment status

Predictor	Any moderate-risk illicit $N = 479$ AOR (95% CI)	Any high-risk illicit $N = 479$ AOR (95% CI)
Age	**0.98 (0.96, 0.99)**	0.98 (0.95, 1.01)
Gender	–	–
Female	1.00	1.00
Male	1.11 (0.70, 1.77)	1.33 (0.58, 3.08)
Employment status	–	–
Employed	1.00	1.00
Unemployed	**1.99 (1.14, 3.46)**	**2.48 (1.01, 6.13)**

Note: Bold values indicate significant differences compared to reference group ($p < 0.05$).
Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.

3.2.2 | Illicit use

Table 5 presents the results of the secondary multinomial logistic regression which assessed the likelihood of reporting any illicit substance-use based on age, gender and employment status. The table is stratified by moderate and high-risk use. The model found unemployed individuals twice as likely to report moderate-risk use of any illicit substance, and 2.5 times as likely to report any high-risk use of any illicit substance. Age was also predictive of moderate-risk illicit use (see Table 5).

4 | DISCUSSION

This study used the ASSIST-Lite to examine the substance-related risk profiles of a sample of ED attendees at an inner-city hospital, across a period of four weekends. Relationships between basic demographic characteristics and risk severity were also assessed, in order to identify where opportunities for targeted screening and brief advice might be appropriate. This study found majority of ED presenters had used at-least one substance in the 3-months prior to their presentation. Alcohol, tobacco and cannabis were most common across all risk levels and, although relatively strong associations were found between risk levels for most drugs, illicit substances showed the strongest correlations between risk. Risky illicit substance use was related to age and employment status, particularly in the case of opioids, stimulants (i.e., methamphetamine) and sedatives.

In this study, males, younger individuals and those without employment were more likely to report higher-risk use across most substances. Unemployment was associated with increased risk of both moderate- and high-risk illicit substance use, with those individuals more likely to report higher-risk use of cannabis, stimulants and opioids. The results found here are consistent with nationally representative data from Australia [13]. The major difference from this study was reflected in the 10-fold higher proportion (around 12%) of individuals aged 20–29 reporting high-risk alcohol consumption. Though such a discrepancy is likely to be a function of the collection window in this study (i.e., weekend nights).

The rate of high-risk polysubstance use among respondents (which included methamphetamine in two-thirds of the cases) is also a source of concern. Polysubstance use increases the likelihood of physical and psychosocial harms [30, 31] and other risky behaviours, including injecting [32]. unsafe sex [33, 34] and antisocial behaviours [35]. While the use of illicit substances, in particular methamphetamine and opioids, contributes to a significant burden on public health [36–38]. Even moderate use is associated with significant healthcare and opportunity costs [36, 39, 40]. Illicit substance-related presentations in the ED are also likely to involve other costs, including police or paramedic involvement [41]; with those presenters more likely to re-visit the ED in the future [3]. Finding effective ways to identify and respond to risky illicit substance use is an ongoing challenge.

The large proportion of single moderate-risk substance users found here highlights an opportunity to identify and intervene early for these individuals. Single-substance moderate-risk users are ideal candidates for targeted brief advice as the time required to provide an effective intervention is significantly shorter. In addition, the high proportion of moderate- and high-risk users of multiple substances also raises the possibility of the need for access to a specialist Consultation-Liaison (CL) alcohol and other drugs service for the ED. The lack of specialist CL service in the Royal Adelaide Hospital ED meant that referral for higher-risk cases was to the ADIS telephone assessment and referral service. There is a risk that this group, who have more complex issues such as dependence, may fail to engage with ADIS once they leave the ED. Individuals reporting high-risk use of multiple illicit substances would likely benefit from an active referral to a CL service, given brief advice alone may not be sufficient enough in promoting risk reduction.

The application of SBIRT approaches in ED settings shows early signs of promise in the reduction of risk of harm [42, 43]. However (except in the case of opioid use disorders), limited investigation into their effectiveness for illicit substance use has occurred through randomised controlled trials [44]. Despite these signs of promise, ED physicians have also yet to embrace the role they can play in scaling up preventive approaches in clinical practise [45]. The findings here add to growing calls for more adequate funding and resourcing to implement, monitor and evaluate the effectiveness and performance of SBIRT models in ED settings [46]. One of the challenges with this view however is that the most salient risk factor in this study (unemployment) is not necessarily attended to most effectively in an ED setting.

While the data from this study provide valuable insights into the illicit and polysubstance use characteristics of individuals presenting to an ED, there are a number of limitations with this study that require discussion. First, those patients deemed by ED staff to need immediate care, or those overtly intoxicated or under 18 years of age were excluded from this study, and no data were collected around the number of exclusions based on these criteria. Although these criteria were necessary for ethical reasons, it does raise questions around the overall representativeness of the sample. Relatedly participants were not asked about their ethnicity, their Aboriginal or Torres Strait Islander status, nor in relation to comorbid mental health and physical health disorders. Future research is needed to capture the risk profiles of individuals within these populations, given differences in risky substance use behaviour is typically reported among these groups.

The lack of randomisation and follow-up protocol is also a methodological limitation. Unfortunately, due to hospital ethics and availability of research associates, a more comprehensive investigation was not possible. However, based on the evidence presented here, future research in the form of randomised controlled trials with adequate follow-up, is needed to understand the medium and longer-term effectiveness of SBIRT approaches in ED settings. Key questions remain regarding the frequency, intensity and duration of which brief intervention approaches are most effective; which components and methods of delivery are most appealing to clinicians and consumers; and the associations between substance use and other behaviours that are high-risk-to-health [47]. Other research might also seek to investigate the patient experience more robustly, potentially through a mixed-methods approach involving qualitative interview. In addition, the data collection window (i.e., Thursday to Sunday nights) is likely to have introduced a sampling bias. This had the highest probability of yielding a broad range of risk profiles for comparison, but future research should investigate whether differences in risky use are more likely to present at other times.

The pooling of moderate- and high-risk substance use in the primary regression model may also be a limitation. The primary statistical justification for combining the groups was to compare those at no level of risk to those at some level of risk, which was important to help

identify differences based on basic demographic characteristics. To avoid conflating the two groups, a secondary analysis investigated demographic differences between moderate- and high-risk groups' use of illicit substances.

The pooling of at-risk groups may also have implications for any subsequent intervention. For example, while there is robust evidence for the efficacy of brief interventions for moderate-risk alcohol and tobacco use, the evidence for the efficacy of such interventions for other substances is less established, though still promising [42, 43]. In the context of EDs, time and resource pressures constrain the ability of staff to deliver more intensive interventions, and therefore brief advice, rather than intervention, may offer a more attractive solution. However future research is also required to understand whether brief advice alone is sufficient for moderate-risk poly illicit substance use, or whether a more intensive approach should be taken for these individuals. Similarly, further research is also needed to assess whether simple referral to a specialist alcohol and other drug telephone assessment and counselling service is sufficient for the high-risk group, or whether a more active referral process (e.g., to a CL service) is required.

5 | CONCLUSIONS

This study piloted the ASSIST-Lite to assess the substance use characteristics of individuals attending the Royal Adelaide Hospital ED. Variations in licit, illicit and polysubstance use were found across demographic characteristics, indicating possible areas where targeted screening and preventive approaches might be useful. Though preliminary, the findings in this study provide insights into patterns of illicit substance use among ED presenters, and may be informative for future research and clinical practise. This pilot study addressed several key barriers associated with the wider implementation of SBIRT in ED settings. First self-completion removed time constraints on ED staff; and second, app-delivered brief advice mitigated limitations on staff knowledge and skill capacity to deliver an effective brief intervention. However, the rates of moderate and high-risk use identified here indicate several areas for future research, particularly into how and which type of brief intervention might best be deployed to prevent future risk of harm. Importantly, for those at higher-risk, this study also highlights that a more active referral, through connection to CL service may be preferable, rather than a passive connection to an ADIS telephone referral and assessment service.

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AUTHOR CONTRIBUTIONS

Each author certifies that their contribution to this work meets the standards of the International Committee of Medical Journal Editors.

CONFLICT OF INTEREST

The authors declare no competing interests. The authors alone are responsible for the content and writing of this manuscript.

ETHICS STATEMENT

Ethics approval was obtained from the Central Adelaide Local Health Network Human Research Ethics Committee (Approval number HREC/17/RAH/120).

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APPENDIX A

ASSIST-LITE QUESTIONNAIRE

Instructions

The questions ask about psychoactive substance use in the past 3 months only.

Ask about each substance in order and only proceed to the supplementary questions if the person has used that substance. On completion of all the questions, count the number of 'yes' responses to obtain a score for each substance, and mark the risk category.

Provide a brief intervention relevant to the risk category.

Guide to a Brief Intervention

Low risk: General health advice and encourage not to increase use.

Moderate risk: Provide a brief intervention using the FRAMES Model and offer take home information.

High risk: Provide a brief intervention using the FRAMES Model and encourage further assessment by a specialist drug and alcohol service. Facilitate referral and provide take home information.

Note: FRAMES—Feedback, Responsibility, Advice, Menu of options, Empathy, Self-efficacy.

In the past 3 months	Yes	No
1. Did you smoke a cigarette containing tobacco?		
1a. Did you usually smoke more than 10 cigarettes each day?		
1b. Did you usually smoke within 30 minutes after waking?		
Score for tobacco (count "yes" answers) Risk category: Low (0) Moderate (1 or 2) High (3)		
2. Did you have a drink containing alcohol?		
2a. On any occasion, did you drink more than 4 standard drinks of alcohol?		
2b. Have you tried and failed to control, cut down or stop drinking?		
2c. Has anyone expressed concern about your drinking?		
Score for alcohol (count "yes" answers) Risk category: Low (0 or 1) Moderate (2) High (3 or 4)		
3. Did you use cannabis?		
3a. Have you had a strong desire or urge to use cannabis at least once a week or more often?		
3b. Has anyone expressed concern about your use of cannabis?		
Score for cannabis (count "yes" answers) Risk category: Low (0) Moderate (1 or 2) High (3)		
4. Did you use an amphetamine-type stimulant, or cocaine, or a stimulant medication not as prescribed?		
4a. Did you use a stimulant at least once each week or more often?		
4b. Has anyone expressed concern about your use of a stimulant?		
Score for stimulants (count "yes" answers) Risk category: Low (0) Moderate (1 or 2) High (3)		
5. Did you use a sedative or sleeping medication not as prescribed?		
5a. Have you had a strong desire or urge to use a sedative or sleeping medication at least once a week or more often?		
5b. Has anyone expressed concern about your use of a sedative or sleeping medication?		
Score for sedatives (count "yes" answers) Risk category: Low (0) Moderate (1 or 2) High (3)		
6. Did you use a street opioid (e.g., heroin) or an opioid-containing medication not as prescribed?		
6a. Have you tried and failed to control, cut down or stop using an opioid?		
6b. Has anyone expressed concern about your use of an opioid?		
Score for opioids (count "yes" answers) Risk category: Low (0) Moderate (1 or 2) High (3)		
7. Did you use any other psychoactive substances? If yes, what did you take? (Not scored, but prompts further assessment)		