

Prevalence and correlates of alcohol dependence in an Australian Aboriginal and Torres Strait Islander representative sample: using the Grog Survey App

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Competing interests

The authors have none to declare.

Abstract

Introduction

Little is known on the prevalence of current alcohol dependence in Indigenous Australian communities. Here we identify the frequency of reported symptoms, estimate the prevalence and describe the correlates of current alcohol dependence.

Methods

A representative sample of Indigenous Australians (16+) was recruited from an urban and remote community in South Australia. Data were collected between July and October 2019 via a tablet computer-based application. Participants were likely dependent if they reported two or more dependence symptoms (ICD-11; in the last 12-months), weekly or more frequently. Chi-square tests described the relationship between demographics, remoteness and alcohol dependence. Spearman correlations estimated the relationship between symptoms of dependence, consumption characteristics and demographics.

Results

A total of 775 Indigenous Australians participated. The most frequently reported symptoms were prioritising alcohol over other things and loss of control. Overall, 2.2% were likely dependent on alcohol ($n = 17/775$). Prevalence did not vary by remoteness. Participants who drank more and more frequently tended to report more frequent symptoms of dependence. In the urban site, men tended to report more frequent symptoms of dependence than women. Age, income and schooling were not linked to dependence.

Discussion and Conclusions

The prevalence of current alcohol dependence in this representative sample was similar to that of the general Australian and international estimates. Understanding risk factors for current alcohol dependence will be useful to inform allocation of funding and support.

Accurate estimates of the prevalence of current alcohol dependence are important to better identify specialist treatment needs.

Key words

Australia; Aboriginal and Torres Strait Islander peoples; Indigenous; alcohol dependence; prevalence

Introduction

Alcohol is a leading cause of mortality globally, causing 5.3% of all deaths (aged 15+) [1]. In Australia, risky drinking (above recommended guidelines) is common [2] and encouraged in many peer groups [3-5]. For Aboriginal and Torres Strait Islander (hereafter Indigenous) Australians, there can be an increased risk of drinking above recommended guidelines among those who do drink [6, 7]. This is linked to the effects of colonisation [8]. Loss of land and systematic oppressive government policies, including the forced removal of children—the Stolen Generations—has contributed to intergenerational trauma [9] and stress, making alcohol dependence more likely [7, 10]. Most Indigenous Australians were legally banned from accessing alcohol until the 1960s. This discriminatory policy meant that for many drinking became a symbol of one's legal right to drink. Knowing the effects of colonisation and past government policies can help contextualise our understanding of why some Indigenous Australians may be at greater risk of developing alcohol dependence.

Globally, the World Health Organization's International Classification of Diseases (ICD) sets out guidelines to identify current alcohol dependence (ICD-11; last 12-months) [11].

Similarly, the American Psychiatric Association's Diagnostic and Statistical Manual (DSM) sets out criteria for moderate to severe alcohol use disorders (DSM-V) [12]. In earlier editions of the DSM the closest equivalent to this was alcohol dependence. Among nonIndigenous populations globally, one in forty people are estimated to be alcohol dependent (2.6%, aged 15+, last 12-months; ICD-10) [1]. In Australia, the prevalence of alcohol dependence is estimated at 1.4% (aged 16-85, last 12-months; DSM-IV) [13].

Among

Indigenous Peoples in similarly colonised countries (New Zealand, Canada and the United States of America [USA]) the prevalence of current alcohol dependence varies greatly (3.8-16.6%, last 12-months; representative samples) [14]. Variance in estimates may reflect the differences in measures used and the unique challenges and strengths of Indigenous communities.

Little is known on the prevalence of current alcohol dependence in Indigenous Australian communities [14]. The available estimates are unlikely to be representative of communities. For example, previous studies have included prison populations [15, 16] or people living in remote communities with high prevalence of past psychological trauma [9]. A recent metaanalysis demonstrated large variance in alcohol consumption within and between Indigenous Australian communities [17]. Based on that, local estimates—in addition to national—are needed to improve our understanding of alcohol dependence in Indigenous Australians.

Correlational studies can help determine which individuals are more likely to need support within a community, but little research has examined the correlates of current alcohol dependence among Indigenous Peoples from similarly colonised countries [14]. In the USA, men and individuals with lower income were at increased risk of current alcohol dependence (in two Native American samples, n = 3084, 1997 to 1999) [18]. But, in Australia no Indigenous-specific data are available on likely risk factors for current alcohol dependence [14].

To improve our understanding of current alcohol dependence among Indigenous Australians we surveyed two communities—urban and remote. We aimed to: 1) identify the frequency of reported symptoms of current alcohol dependence (ICD-11) in two representative community samples; 2) estimate the prevalence of current alcohol dependence; and 3) describe the correlates of current alcohol dependence.

Methods

Aboriginal leadership

This study was designed by study investigators (including KL, KC, RR, NH) in consultation with the Aboriginal Drug and Alcohol Council of South Australia (SW, JP). The lead author (TW) is an Aboriginal Australian of the Kamilaroi and Anaiwan nations.

Ethical approval

Ethical approval was obtained from the Aboriginal Health Council of South Australia (Ref: 04/15/621) and (as this was part of a larger study) from Metro South Health Human Research Ethics Committee in Queensland (Ref: HREC/16/QPAH/293).

Setting

The study was conducted in two sites in the Australian state of South Australia—urban and remote. Community names have been withheld to preserve their anonymity. There were no alcohol restrictions in either site.

Urban: a sample of Indigenous Australians was drawn from an Indigenous area (as defined by the Australian Bureau of Statistics) [19]. More than 2% of residents were Indigenous Australian [19]. The community has a range of amenities, including shopping centres, food outlets, fuel stations, health services, government and non-government service providers, entertainment venues, parks, playgrounds, childcare services, public and private schools, and further training and education providers.

Remote: a sample of Indigenous Australians was drawn from a 'very remote' town as classified by the Australian Statistical Geography Standard [20]. The town is more than 1,000 kilometres from the nearest capital city and more than half of the residents were Indigenous Australian. The community has grocery stores, service providers including a health clinic, a public school, police station and licensed venues ('pubs').

Eligibility

To participate in the study, individuals needed to be Aboriginal and/or Torres Strait Islander, aged 16 years or older, and living in one of the two study sites (including individuals sleeping rough or “couch surfing”).

Recruitment

Research assistants confirmed an individual’s eligibility and set them up with an iPad and headphones. Participants completed the App survey anonymously. No names or birth dates were recorded. On survey completion, participants were reimbursed for their time with a store voucher (\$20 for urban; \$25 for remote—reflecting higher cost of living). Recruitment was responsive to field research assistants’ and local service recommendations (e.g. when to stay longer at data collection events, or to postpone events due to ‘sorry business’ or death in the community, or for other unforeseen community events). Research assistants received one day of face-to-face training in study methods and survey administration from two study investigators (KL, KC).

Urban: Ten research assistants (7 Aboriginal, 3 non-Indigenous; 6 men and 4 women) collected survey data. Aboriginal research assistants included health professionals (n = 4; JP), a PhD candidate (n = 1; TW), a medical student (n = 1), and a research administrative assistant (n = 1). Four of the Aboriginal research assistants lived and worked in the study site for more than 25 years each and had strong connections with the local Aboriginal community. The non-Indigenous staff were project officers (n = 2; MF) and a study investigator (n = 1; KL). A quota-based convenience sample stratified by age, gender and socioeconomic status was used to recruit a representative sample [21]. Recruitment was conducted for 36 days over 3.7 months (July, September to October 2019). Recruitment included a mix of planned events in local services, local groups (cultural and hobby groups), public events in public spaces (e.g. local parklands, beaches, skate parks or shopping

centres) and unplanned events in public spaces (e.g. local shopping centres, beaches, skate parks). Recruitment is described in further detail elsewhere [21].

Remote: Due to the small number of eligible community members (n = 57) [19] we endeavoured to recruit everyone who was eligible. Four research assistants (3 Aboriginal, 1 non-Indigenous; 2 men, 2 women) collected survey data. Of the three Aboriginal research assistants, all were well known to the local community. There were two drug and alcohol workers (n = 1, local resident; n = 1, 10+ years visiting for work; JP) and an Aboriginal health worker. The non-Indigenous staff member was a project officer (MF). Recruitment took place over two trips totalling 14 days (July to August, October 2019). The project was promoted through local services, with recruitment taking place at planned events (e.g. barbeques at women's centre, council office, general stores) and ad hoc events in public spaces.

Data collection

Grog Survey App

Data were collected as part of a five-year Australian National Health and Medical Research Council project grant. The overall aim of that project was to develop and test a tablet computer-based App. The App was designed to help Indigenous Australians describe if they drink alcohol and if so, what they drink and how much. The App has been described in detail elsewhere [22] and has been shown to be an acceptable [23] and accurate [24] survey tool.

The App collects information on demographics (including age, gender, language spoken, highest educational attainment, individual income per week: <200; 200-399; 400-599; 600-799; 800+ \$AUD), alcohol consumption (modified Finnish method [25, 26] and Timeline Followback [27]), money spent on alcohol (0-25; 26-50; 51-75; 76-99; 100+ \$AUD), frequency of symptoms of alcohol dependence (ICD-11), harms to self or others, treatment access, and participants' feedback on using the App [22]. All survey data were collected offline and synchronised daily to a secure server hosted by the University of Sydney. The

App is available in plain English and Pitjantjatjara (an Aboriginal language commonly spoken in areas bordering South Australia, Western Australia and the Northern Territory).

Symptoms of current alcohol dependence

The term 'alcohol dependence' has been used as a concept replacing "alcoholism" or "alcohol addiction" since the late 1970s [28]. There has been recognition that the concept of dependence is culture-bound to some extent [29]. However, World Health Organization studies have found substantial cross-cultural recognition of the three major criteria included in the ICD-11 definition of alcohol dependence [30]. In preparation for this study, careful consultation with Indigenous Australian community members, Indigenous (SW, JP, NH) and non-Indigenous health professionals (KC) and researchers (KC, RR, KL) was undertaken to operationalise these guidelines for an Indigenous Australian audience.

Three dependence questions were developed and based on ICD-11 guidelines (last 12months; Table 1) [11]. Only current drinkers (last 12-months) were asked dependence items. Participants were asked about: 1) Loss of control—"Some people feel like grog is the boss of them. In the last 12 months how often do you feel grog makes all the decisions (so you could not stop drinking, even if you tried)?"; 2) Alcohol withdrawal tremors ('grog shakes')—"Some people's hands shake when they stop drinking or before their first drink of the day. In the last 12 months how often does this happen to you?"; and 3) Prioritising alcohol over other things—"Some people spend more time drinking than doing other things they need to do, like looking after family, culture or work. In the last 12 months how often does this happen with you?". Responses for each item were indicated on a five-point Likert scale ranging from:

a) never; b) 'once in a blue moon' (hardly ever, less than once a month); c) sometimes (1-3 times a month); d) weekly; to e) most days or every day.

(Insert Table 1 about here)

Data analysis

Data cleaning and analysis were performed using R (version 4.0.4) [31]. Age was recoded into four categories to match those of the Australian Bureau of Statistics (16-24, 25-44, 45-64, 65+). Completion of schooling, training, and university were recoded into six categories to determine the highest level of educational attainment: university; apprenticeship or TAFE (Technical and Further Education); Year 12; Year 11; Year 10; Year 9 or below.

Demographic characteristics and symptoms of dependence (among current drinkers) were described by remoteness.

Participants were classified as likely to be dependent if they reported any two or more symptoms of dependence, weekly or more frequently [11, 32]. This threshold was chosen based on its face validity and because of likely impact of symptoms of this frequency on participants and their communities. Chi-square tests described the relationship between demographic characteristics, remoteness and likely alcohol dependence.

A total symptom frequency score was calculated for all current drinkers by summing the three dependence responses ('never' = 0 to 'most days or every day' = 4; maximum score of 12). Spearman correlations were used to estimate the relationship between the total symptom frequency score, alcohol consumption characteristics, gender, remoteness, age, income earned, schooling and money spent on alcohol.

Results

Participants

A total of 775 Indigenous Australians (47.1% men, 52.9% women; Table 2) completed the App from two study sites (urban 91.1%, n = 706; remote 8.9%, n = 69).

(Insert Table 2 about here)

Demographic characteristics

Participants had a mean age of 37.8 years (SD = 16.2) and 40.0 years (SD = 15.1) in the urban and remote communities respectively. Just under half of the sample were men in both sites (urban: 47.3%; remote: 44.9%; Table 2). The majority of participants reported their highest level of educational attainment as between year 10 and year 12 (urban: 51.7%; remote: 39.1%). Just under one third (29.2%) of participants in the urban site had completed further training or university as their highest educational attainment, whilst approximately half (47.8%) of the remote site had completed either year 9 or lower at school. Between one in five (20.8%) and one in four (24.6%) participants worked full-time in the urban and remote communities, respectively. In the remote site, more than half (56.5%) of the participants were unemployed. In the urban site, more women (38.0%) were unemployed than men (30.6%) X^2 (df = 1) = 4.1, $p = 0.04$. Most participants earned between \$200 and \$599 each week (urban: 49.4%; remote: 53.6%), with the remainder split between earning more and earning less than this. In the remote site approximately one quarter of participants' first language was an Australian Aboriginal language (23.2%), but this was less common in the urban site (6.4%).

Alcohol consumption

More than one in five (23%) participants did not consume any alcohol in the last 12 months, and so were excluded from the remaining analyses. There were 597 (77%) current drinkers (urban: $n = 554$, 92.8%; remote: $n = 43$, 7.2%).

Frequency of current alcohol dependence symptoms (ICD-11)

Overall, the most frequently reported symptoms of dependence were prioritising alcohol over other things and loss of control, and then tremors (Figure 1). In the remote site,

approximately one in ten (9.3%) current drinkers experienced loss of control over their drinking most days or every day.

(Insert Figure 1 about here)

Prevalence of current alcohol dependence (ICD-11)

For the overall sample, 2.2% were likely alcohol dependent (n = 17/775; urban and remote).

Similar proportions were likely dependent in each site (urban: 2.3%, n = 16/706; remote: 1.4%, n = 1/69).

Among current drinkers, 2.8% were likely alcohol dependent (n = 17/597; urban and remote).

Similar proportions of current drinkers were likely dependent in each site (urban: 2.9%, n = 16/554; remote: 2.3%, n = 1/43).

Correlates of current alcohol dependence (ICD-11)

Table 3 shows the correlations between the total symptom frequency score (0-12), and alcohol consumption characteristics, gender, remoteness, age, income, level of completed schooling and money spent on alcohol. Individuals who consumed more alcohol when they drank and who drank more frequently, reported more frequent symptoms of dependence. There was a moderate to strong correlation between each of the three dependence symptoms ($r_s = 0.54-0.63$). Men tended to drink more frequently and have more drinks per occasion or per day than women, but men were only slightly more likely to report symptoms of dependence. Age was not linked to total symptom frequency score in either study site (urban: $r_s = 0.06$, $p = 0.13$; remote: $r_s = 0.11$, $p = 0.49$). In the urban site, men reported more frequent symptoms of dependence than women ($r_s = 0.12$, $p = 0.004$). Individuals who drank more frequently or consumed more drinks per occasion, spent more money on alcohol.

(Insert Table 3 about here)

Discussion

We aimed to measure the proportion of Indigenous Australians in two communities who are dependent on alcohol and how dependence is associated with demographic factors. We found that the prevalence of likely current alcohol dependence in these representative samples is similar to that of the general Australian population [13]. This is important to inform planning for treatment services and health promotion strategies. This finding is also important given the common negative stereotyping of Indigenous Australians and their use of alcohol as portrayed in Australian society and media [7, 33]. As expected, symptoms of dependence were more common in those who drink more alcohol more frequently. Also, in the urban site, men were more likely to be dependent. These data help us understand who might be at increased risk of developing current alcohol dependence, and to tailor prevention and treatment efforts accordingly.

Frequency of current alcohol dependence symptoms (ICD-11)

Alcohol withdrawal tremors ('grog shakes') were the least reported dependence symptom. This is perhaps not surprising as episodic drinking can be common for Indigenous Australians [22] and tremors are typically seen in people with chronic daily heavy alcohol consumption [6]. Withdrawal is also not an essential feature for a diagnosis of alcohol dependence [32] and is not always experienced when a dependent drinker stops drinking [34].

One in ten (9.3%) individuals in the remote sample reported loss of control most days or every day. Loss of control is a key feature of alcohol dependence [35]. However, in some cultures, people freely admit to drinking alcohol with the goal of losing control [36]. In an Australian Indigenous context, loss of control can be a form of escapism—from trauma, racism and systematic government oppression [37]. Whether the loss of control preceded or resulted from alcohol dependence we cannot say from this study. However, in our sample,

frequency of loss of control correlated well with the frequency of other dependence symptoms.

Prevalence of current alcohol dependence (ICD-11)

The prevalence of current alcohol dependence in this representative sample is similar to both general Australian and worldwide estimates (1.4% and 2.6%, respectively) [1, 13]. We found a lower prevalence of current alcohol dependence compared with Indigenous Peoples from New Zealand, Canada and the USA. Among these Indigenous Peoples, studies that used stratified sampling or methods that involved contacting all eligible participants (representative samples) reported prevalences of 3.8-16.6% [14]. More work is needed to co-design studies with Indigenous researchers, communities and Elders, and to use representative sampling and recruitment methods that best suit the local context.

Correlates of current alcohol dependence (ICD-11)

Identifying factors that are linked to increased risk of current alcohol dependence can help determine where prevention and treatment efforts should be targeted. In the urban area, we found men tended to report more frequent symptoms of dependence than women, which is consistent with previous literature of general populations [38, 39]. Overall, there was heavier drinking among males than among females reporting dependence symptoms. We also found that people who earned more money each week or had a higher education were less likely to report symptoms of dependence. In keeping with this, USA studies of First Nations [18] and general populations [38] have found that individuals who had either not graduated from high school [18] or had a lower income [18, 38] had a higher risk of current alcohol dependence. It is not clear if educational attainment or income earned can be protective against alcohol dependence, or if risk factors in the family environment (e.g. an immediate family member being alcohol dependent) make it harder for individuals to stay in school or pursue higher education, or if early alcohol-related problems interfere with both education and employment.

Among the overall sample, age was not associated with dependence. This is consistent with findings from earlier USA-based studies (with both First Nation American [40] and general populations [39]). However, other general population studies, including an Australian national survey [13], found alcohol dependence was more prevalent in young people (aged under 30) [13, 40, 41] or older people (aged 50-64) [41]. Further study of the distribution of dependence across age groups would be useful. In the meantime, our finding illustrates the importance of appropriate treatment and specialist care that is accessible to individuals across all ages.

Implications for policy, practice and research

While this study helps to address the gap in understanding alcohol dependence in Aboriginal communities, more research on dependence among Indigenous Australians conducted with study communities is needed. Specifically, researchers should consider recruiting representative samples across multiple communities that can reflect the diverse history, experiences, remoteness, living situations and policies affecting Indigenous Australians being surveyed. In both research and clinical settings, tools to screen for or assess dependence may need to be operationalised for Indigenous Australians so they can more accurately detect current alcohol dependence [14].

Limitations

This study presents data from one urban and one remote community of Indigenous Australians from one state of Australia and therefore is not generalisable to other Indigenous communities in Australia. It is possible some participants could have completed the survey more than once, however recruitment strategies were designed to minimise this occurring. For example, research assistants, who were known in each study site, greeted each participant before setting them up on an iPad. At the time of data collection, the App was not able to systematically record refusals to take part in a survey. A modification has since been

made to the App. Prevalence estimates could have been affected to some degree by nonresponse in the urban setting. This is unlikely to be the case for the remote community as our sample exceeded the local population according to the 2016 Australian Census of Population and Housing [19]. Alcohol dependence in this study was defined as two or more symptoms reported occurring at least weekly or more frequently. Different thresholds for symptom frequency will result in different prevalence estimates. The alcohol dependence items have not been formally validated, however, each dependence item showed a correlation, as expected, with other dependence items, gender, and with indicators of drinking. Also, ICD-11 dependence features were operationalised with input from Aboriginal health professionals (JP, SW, NH).

Conclusion

This study found that prevalence of current alcohol dependence in two representative samples of Indigenous Australians was similar to that of general Australian populations but just less than Indigenous populations internationally. Understanding factors that increase an individual's risk of developing current alcohol dependence can help inform where funding and support is most needed in Indigenous communities. Accurate estimates of the prevalence of current alcohol dependence can better inform planning for specialist treatment needs.

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Table 1 Comparison of items on past year alcohol dependence using the Grog Survey App with ICD-11 descriptions of alcohol dependence and DSM-5 description of alcohol use disorder

App item	ICD-11 [11, 42]	DSM-5 ^a [12]
“Some people feel like grog is the boss of them. In the last 12 months how often do you feel grog makes all the decisions (so you could not stop drinking, even if you tried)?”	Impaired ability to control use	1. Alcohol is often taken in larger amounts or over a longer period than was intended
		2. There is a persistent desire or unsuccessful efforts to cut down or control alcohol use
		4. Craving, or a strong desire or urge to use alcohol
“Some people’s hands shake when they stop drinking or before their first drink of the day. In the last 12 months how often does this happen to you?”	Physiological features of dependence	10. Tolerance, as defined by either of the following: a. A need for markedly increased amounts of alcohol to achieve intoxication or desired effect. b. A markedly diminished effect with continued use of the same amount of alcohol.
		11. Withdrawal, as manifested by either of the following: a. The characteristic withdrawal syndrome for alcohol (refer to Criteria A and B of the criteria set for alcohol withdrawal, pp. 499–500). b. Alcohol (or a closely related substance, such as a benzodiazepine) is taken to relieve or avoid withdrawal symptoms.
“Some people spend more time drinking than doing other things they need to do, like looking after family, culture or work. In the last 12 months how often does this happen with you?”	Increasing priority given to use over other activities and persistence of use despite harm or negative consequences	3. A great deal of time is spent in activities necessary to obtain alcohol, use alcohol, or recover from its effects
		5. Recurrent alcohol use resulting in a failure to fulfill major role obligations at work, school, or home
		6. Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol
		7. Important social, occupational, or recreational activities are given up or reduced because of alcohol use
		9. Alcohol use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by alcohol

^a Numbering as presented in DSM-5 Alcohol Use Disorder. Diagnostic Criteria 8 (Recurrent alcohol use in situations in which it is physically hazardous) did not align with ICD-11 and is deliberately omitted.

Table 2 Participant demographic characteristics (n = 775)

Variable	Urban (n = 706) n (%)	Remote (n = 69) n (%)	Total (n = 775) n (%)
Age			
16-24	188 (26.6)	12 (17.4)	200 (25.8)
25-44	276 (39.1)	28 (40.6)	304 (39.2)
45-64	191 (27.1)	25 (36.2)	216 (27.9)
65+	51 (7.2)	4 (5.8)	55 (7.1)
Gender			
Female	372 (52.7)	38 (55.1)	410 (52.9)
Male	334 (47.3)	31 (44.9)	365 (47.1)
Level of highest educational attainment			
University	38 (5.4)	-	38 (4.9)
TAFE ^a or apprenticeship	168 (23.8)	9 (13.0)	177 (22.8)
Year 12	97 (13.7)	6 (8.7)	103 (13.3)
Year 11	124 (17.6)	13 (18.8)	137 (17.7)
Year 10	144 (20.4)	8 (11.6)	152 (19.6)
Year 9 or below	135 (19.1)	33 (47.8)	168 (21.7)
Employment status			
Full-time	147 (20.8)	17 (24.6)	164 (21.2)
Part-time	36 (5.1)	6 (8.7)	42 (5.4)
Casual	30 (4.2)	1 (1.4)	31 (4.0)
'Work for the dole'/ CDP ^b	4 (0.6)	6 (8.7)	10 (1.3)
Other	5 (0.7)	-	5 (0.6)
None	484 (68.6)	39 (56.5)	523 (67.5)
Individual weekly income (\$AUD)			
<200	137 (19.4)	10 (14.5)	147 (19.0)

Variable	Urban (n = 706) n (%)	Remote (n = 69) n (%)	Total (n = 775) n (%)
200-399	193 (27.3)	15 (21.7)	208 (26.8)
400-599	156 (22.1)	22 (31.9)	178 (23.0)
600-799	80 (11.3)	9 (13.0)	89 (11.5)
>800	140 (19.8)	13 (18.8)	153 (19.7)
Language spoken at home			
English	651 (92.2)	51 (73.9)	702 (90.6)
Aboriginal or Torres Strait Islander	45 (6.4)	16 (23.2)	61 (7.9)
Other	10 (1.4)	2 (2.9)	12 (1.5)

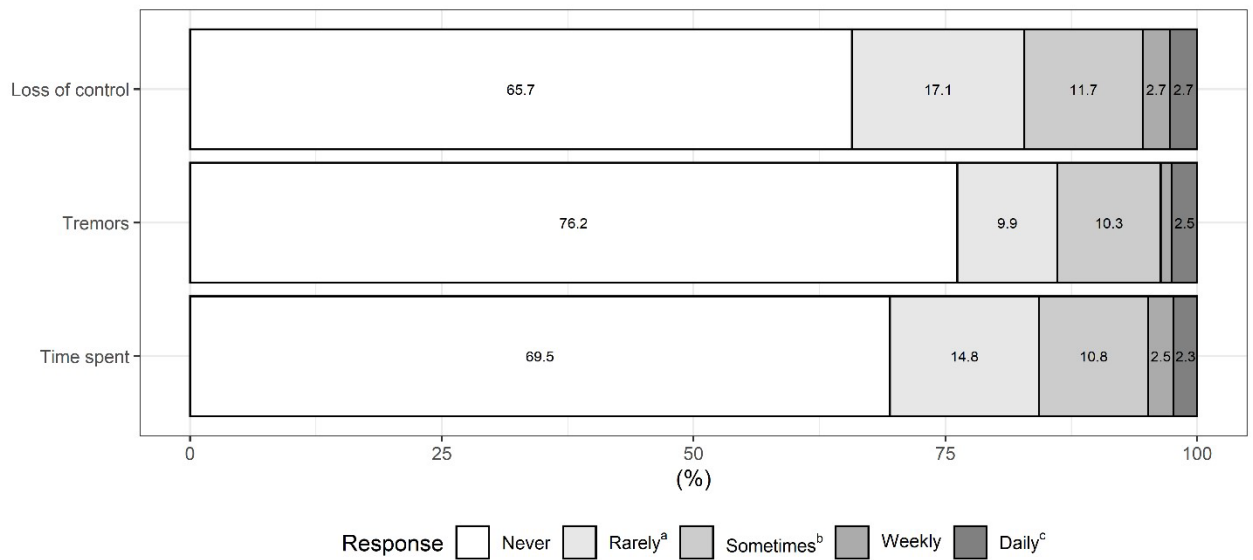
Footnotes:

^a TAFE: Technical and Further Education

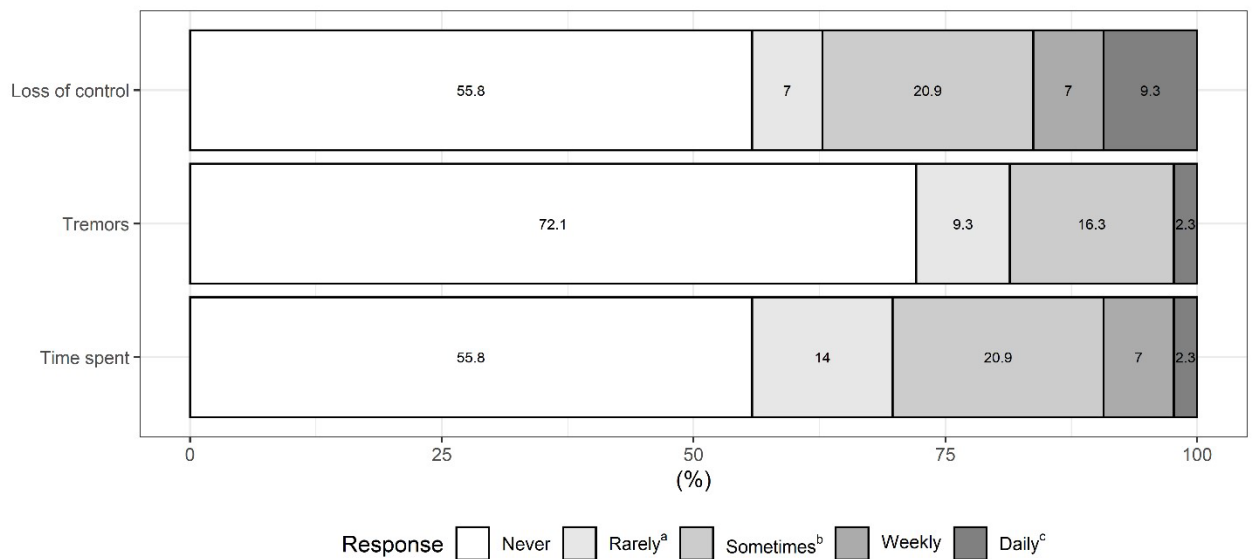
^b CDP: Community Development Program (Australian Government remote employment and development service)

Figure 1 Frequency of alcohol dependence symptoms (ICD-11) among current drinkers (n = 597) by remoteness

Urban (n = 554)



Remote (n = 43)



^a 'Once in a blue moon' (hardly ever, less than once a month)

^b Sometimes (1-3 times a month)

^c Most days or every day

Table 3 Spearman correlations of alcohol dependence symptoms (ICD-11), alcohol consumption characteristics and demographics among current drinkers (n = 597)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Loss of control	-											
2. Tremors	.54*	-										
3. Time spent	.63*	.60*	-									
4. Symptom frequency score	.86*	.75*	.84*	-								
5. Drinking frequency	.24*	.23*	.30*	.30*	-							
6. Drinks per occasion	.19*	.18*	.24*	.25*	.23*	-						
7. Drinks per day (mean)	.27*	.26*	.34*	.35*	.87*	.66*	-					
8. Male	.05	.10*	.11*	.12*	.24*	.25*	.31*	-				
9. Remote	.08*	.03	.09*	.08	.05	.04	.06	-.01	-			
10. Age	.08*	.09*	.09*	.07	.01	-.19*	-.07	-.05	.02	-		
11. Income	-.12*	-.11*	-.11*	-.13*	.06	-.08*	-.02	.02	.05	.33*	-	
12. Schooling	-.19*	-.19*	-.22*	-.21*	-.06	-.06	-.07	-.05	-.09*	-.23*	.11*	-
13. Money spent on alcohol	.21*	.18*	.24*	.27*	.37*	.42*	.48*	.12*	.14*	-.08	.06	-.05

Note: * $p < 0.05$; Loss of control = diminished control over drinking; Tremors = alcohol withdrawal tremors; Time spent = prioritising alcohol over other things; Symptom frequency score = total score of three dependence responses, ranging from 0-12; Drinking frequency = number of drinking occasions per month; Drinks per occasion = number of standard drinks per drinking occasion; Drinks per day = number of standard drinks averaged across all days; Male = binary, participant is male; Remote = binary, participant is from a remote area; Age = age in years; Income = individual weekly income categories, recoded 1-5; Schooling = years of completed schooling; Money spent on alcohol = recoded 1-5; Male and Remote were coded as dummy variables, to find the values for females, and urban areas, these correlations can be multiplied by -1