

Alcohol and other substance use among a sample of young people in the Solomon Islands

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There have been few studies in the Solomon Islands that examine patterns of alcohol and other substance use by the general population and young people more specifically. This mirrors the situation among Pacific Island countries and territories more generally.¹ Existing studies that have investigated substance use throughout the Solomon Islands²⁻⁴ have not comprehensively defined or indicated levels of substance consumption or certain use patterns, and factors associated with more harmful substance use behaviours. For example, 7% of respondents to the country's recent Household Income and Expenditure Survey⁴ reported drinking alcohol in the past week, and 18% of students (aged 13–15 years) who completed the Global School-based Student Health Survey in 2011 reported consuming at least one alcoholic drink in the previous 30 days;³ however, neither study provided information on consumption patterns (e.g. frequency and quantity of use), which are widely considered fundamental to understanding alcohol use and harm.^{5,6} Indeed, despite a dearth of thorough investigations of alcohol use patterns and related issues in the Solomon Islands, researchers have suggested that it is a primary drug of concern and that heavy alcohol use by the country's general population and throughout the wider Pacific region, including among young people, is a significant and consistent public health problem.⁷ For example, numerous short- and long-term alcohol-related consequences, such as drink-driving, violence and adverse mental health outcomes, are reported to

Abstract

Objective: Investigate alcohol and other substance use, with a focus on harmful alcohol use patterns, among young people in the Solomon Islands.

Methods: A structured, interviewer-administered questionnaire was administered to respondents aged 15–24 years across four of the country's provinces in late 2015.

Results: Four hundred young people completed the questionnaire across urban, peri-urban and rural communities. The most common substances ever used by participants were betel nut (94%), licit/store-bought and/or illicit alcohol (79%) and tobacco (76%). Lifetime and recent substance use was particularly common among male respondents; e.g. 89% of male participants reported ever using any alcohol versus 54% of females ($p < 0.001$). Harmful alcohol use patterns were common.

Conclusions: Our sample generally reported higher levels of substance use compared to previous research in the Solomon Islands, including in relation to the country's relatively recent (2012/13) Household Income and Expenditure Survey.

Implications for public health: Our study made considerable advances in addressing key knowledge gaps regarding alcohol and other substance use among young people in the Solomon Islands. Evidence-based initiatives to address early initiation of alcohol and other substance use and the progression to more problematic use patterns among young people in the Solomon Islands need to be explored.

Key words: Pacific region, epidemiology, alcohol and drug use, young people, policy

be major concerns in the region.¹ In the Solomon Islands, issues associated with harmful alcohol use are further complicated by the consumption of two main types of illicit alcohol, 'homebrew' (typically produced by the fermentation of sugar, yeast and fruit juice in water) and 'kwaso' (a spirit distilled from homebrew). These illicit alcohol types are reportedly popular among low-income and unemployed people and young people (due to factors including low price and high availability) and can have very high alcohol concentrations.^{8,9}

Indicators of the use of substances other than alcohol in the Solomon Islands are

also lacking. For example, although the World Health Organization's (WHO) 2006 STEPS survey collected information on the use of alcohol, tobacco and prescribed pharmaceuticals among respondents,² no data were obtained relating to illicit drug consumption. In contrast, the 2011 Global School-based Survey³ collected limited data on marijuana, with findings showing that only a minority – 14% – of the total sample reported ever using the drug (highlighting an additional limitation of alcohol and other substance-related research in the Solomon Islands, this figure could be an underestimate of marijuana use among the country's

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young people given that only students were surveyed). Further, although chewing of 'betel nut' (a key cultural practice in north-western Pacific nations including the Solomon Islands, Papua New Guinea and Federated States of Micronesia) is reportedly widespread among young Solomon Islanders and the population in general,^{10,11} there is a paucity of literature on the topic. The limited available research notes that some of the adverse consequences of betel nut use include periodontitis (leading to loss of teeth) and other oral health issues, including oral cancer.¹¹

In the context of limited funding and resources to respond to alcohol- and other substance-related harms in the Solomon Islands, interventions focused on young people who engage in substance use may alleviate any resultant impacts on individuals, families and communities, and the country's health, social support and law enforcement sectors. However, such initiatives need to be evidence-based and relevant to local contexts. In consideration of this and the knowledge gaps outlined above, we aimed to: investigate patterns of alcohol and other substance use among a sample of young people recruited from targeted locations across the Solomon Islands; and identify factors associated with more harmful (i.e. heavier and more frequent) alcohol use patterns.

Method

Our study incorporated a multidisciplinary and collaborative approach to investigate alcohol and other substance use among young people in the Solomon Islands. We obtained input from relevant local stakeholders (e.g. government representatives, healthcare workers) during September 2015 to complement literature review in designing the study. The resultant study involved two key components:

1. A structured survey administered to a non-representative sample of young people
2. A series of focus group discussions with stakeholders and also young people.

We focus here solely on the quantitative data collected from young survey participants.

Sample

We recruited participants during October and November 2015 throughout four provinces in the Solomon Islands: Choiseul, Guadalcanal (Honiara), Malaita and Western. In consultation with stakeholders working in each of these provinces, specific recruitment

locations (i.e. towns/villages) were chosen with the intention of sourcing a range of young people from urban, peri-urban and rural/regional communities. We used targeted sampling measures, i.e. trained fieldworkers approached potential participants (young people) in public areas of the recruitment locations, informed them about the study and invited them to participate if they were eligible. Participants were not reimbursed.

Eligibility criteria

Potential respondents were required to: be aged between 15 and 24 years; reside in one of the aforementioned provinces at the time of recruitment; and, be able to provide informed consent or assent prior to undertaking the survey. (Parental consent was not required of any participant; however, community leaders and 'gatekeepers', e.g. chiefs, church leaders and elders, were informed about the project before recruitment/data collection.) For potential participants aged less than 18 years (i.e. 15 to 17-year-olds for the purpose of our study), 'assent' refers to agreeing to participate in the research. Assent is not legally binding; however, obtaining assent from individuals aged under 18 is necessary because failing to object to completing the survey should not be interpreted as agreeing to participate in the research.¹²

Questionnaire design and administration

The structured survey comprised tailored questions to collect information on various domains. These included: participant socio-demographics (e.g. age, sex, education history, employment status, residential location type); use of alcohol and other substances; use of alcohol and other substances by people who share the same household; self-perceived social support;¹³ sexual behaviours; and general/physical and mental health.^{14,15} Validated instruments (see Measures) were included in the survey; however, we are not aware of any studies that have validated these instruments specifically for young people in the Solomon Islands. Prior to data collection, a draft survey was disseminated to stakeholders in the Solomon Islands for feedback and input (e.g. in relation to the appropriateness and relevance of questions and specific terms), and each question was translated into Pijin (the country's lingua franca, although English is the official language).¹⁶

Questionnaires were administered face-to-face by trained fieldworkers from a locally based non-government organisation (Save the Children) in each of the four provinces. Data were collected manually on hardcopy forms. No identifying information (e.g. name, address, telephone details or date of birth) was recorded on the questionnaires. Prior to data collection, each questionnaire was allocated a unique sequential number for data entry and analysis purposes. Hardcopy data were entered into an electronic database by trained research assistants.

Measures

Licit and illicit alcohol types: In the Solomon Islands, licit alcohol is purchased from bottleshops/liquor retailers, bars/nightclubs and restaurants and includes imported and locally brewed beer (e.g. Solbrew, Special Brew), wine, 'hard' liquor/spirits (e.g. gin, vodka, whisky) and premixed drinks.⁹ In addition, there are two dominant forms of illicit alcohol: homebrew and kwaso. Previous research has suggested that kwaso is a preferred type of alcohol among young people due to factors including availability, ease of production, greater alcohol content (compared to beer, for example), and because it can be consumed in a variety of ways (e.g. combined with soft drink, 'coffee mix' or coconut water).⁸

Survey participants were asked about lifetime, past-year and 'recent' (past four weeks) use of store-bought alcohol, homebrew and kwaso. Those who reported recent alcohol use were asked to estimate the number of days they had drunk each alcohol type in the past four weeks, in addition to the number of drinks they 'usually' consumed per session of alcohol use. Following stakeholder consultation, measures of consumption included 'cans' (mainly for store-bought beer), 'buckets' (homebrew), 'bottles' (store-bought beer and kwaso) and cups (kwaso).

According to the country's *Liquor Act*,¹⁷ the minimum legal drinking age for purchasing licit alcohol or consuming it in licensed premises is 21 years. However, anecdotal evidence from local stakeholders consulted during and after this project indicates this is rarely enforced.

Harmful short-term ('binge') alcohol use (i.e. quantity consumed): Previous, similar research in the Pacific defined harmful alcohol use as an average consumption of six or more standard drinks on a day when alcohol was consumed.¹⁸ However, for this

study we defined harmful alcohol use as the self-reported consumption of more than six alcoholic drinks in a 'typical' or 'usual' session, as initial exploration of the data showed that few participants (n=24) reported usually drinking less than six drinks per session. Only licit/store-bought alcohol was used in our study because it was impossible to ascertain the alcoholic content of homebrew or kwaso consumed by participants in the previous month. Further, illicit alcohol is consumed in inconsistent quantities and measures (e.g. homebrew is commonly consumed in 'buckets', with multiple people reportedly drinking from the same bucket).

Other substances: Questions were included regarding lifetime and recent (past four weeks) use of substances other than alcohol, including betel nut, tobacco, marijuana, inhalants (i.e. spray paint/'chroming', petrol and glue) and magic mushrooms. Participants were also asked about injecting drug use (IDU) and afforded the opportunity to report use of any other drugs (e.g. methamphetamine, cocaine, heroin).

ENRICHD Social Support Inventory (ESSI): The ESSI is a measure of self-perceived social support and comprises seven items relating to emotional (caring), structural (partner) and instrumental (tangible help) support.¹³ ESSI scores range from 8–34; higher scores indicate greater levels of self-perceived social support.

Personal Wellbeing Index (PWI): The PWI contains seven 'satisfaction' items; each corresponds to different quality of life domains: health; standard of living; personal achieving in life; safety; relationships; future security; and, community-connectedness.¹⁵ Respondents score each domain on a scale from 0 to 10; 0 indicates that they are completely unsatisfied with respect to that life domain, whereas 10 means they are completely satisfied. Participants also rate their personal circumstances and life overall. These scores are converted into units of Percentage of Scale Maximum (%SM), which is achieved using the formula: (score/x)*100, whereby 'x' represents the highest response category and scores range from 0–100.¹⁹

Self-rating of overall health: Participants were asked to provide a subjective rating of their overall health in the past four weeks/month (similar to the first item of the Short Form-8, which has shown to be independently and significantly associated with outcomes including respondents' sociodemographic

characteristics, specific health problems, health service utilisation and mortality).¹⁴ Likert scale responses ranged from 'excellent' to 'very poor' (Table 1).

Design and statistical analysis

Descriptive statistics were calculated to characterise the study sample as a whole and investigate outcomes of interest (e.g. use of alcohol and other substances). Bivariate analyses examined significant associations between variables in relation to participant sex and age around the median (15–19 years vs. 20–24 years), in addition to harmful alcohol use; specific methods included the

Mantel-Haenszel Chi-square and Fisher's exact tests for categorical variables, the Wilcoxon signed-rank test for examining associations between continuous/non-parametric variables and dichotomous categorical variables, and the Kruskal-Wallis test for investigating associations between continuous/non-parametric variables and independent variables with more than two levels. A multivariate logistic regression analysis was used to identify factors that were independently associated with harmful alcohol use. Similarly, a multivariate linear regression model was developed to identify factors that were significantly associated with

Table 1: Sample characteristics by sex, n (%)

	Total sample (N=400)	Males (n=281)	Females (n=119)	p
Age (years)				
Median (range)	19 (15-24)	-	-	
15-19	205 (51)	131 (47)	74 (62)	
20-24	195 (49)	150 (53)	45 (38)	0.004
Female	119 (30)	-	-	-
Education		n=279	n=118	
<i>Currently studying^c</i>	163 (41)	99 (35)	64 (54)	<0.001
<i>Highest level achieved^d</i>		n=280		
No formal schooling	10 (3)	7 (3)	3 (3)	
Less than primary	46 (12)	33 (12)	13 (11)	
Primary	232 (58)	157 (56)	75 (63)	
Secondary	104 (26)	79 (28)	25 (21)	
Tertiary	7 (2)	4 (1)	3 (3)	0.530
Main employment last month^b			n=177	
Unemployed	311 (78)	211 (75)	100 (85)	
Full-time worker	20 (5)	17 (6)	3 (3)	
Casual/part-time worker	24 (6)	16 (6)	8 (7)	
Self-employed	36 (9)	30 (11)	6 (5)	
Other	7 (2)	7 (2)	0 (0)	0.060
Sexual identity^a		n=280		
Heterosexual	383 (96)	267 (95)	116 (97)	
Bisexual	13 (3)	10 (4)	3 (3)	
Homosexual	3 (1)	3 (1)	0 (0)	0.635
Relationship status^a		n=280		
Single	155 (39)	117 (42)	38 (32)	
Married /de facto/living together	53 (13)	38 (14)	15 (13)	
Stable relationship (not living together)	191 (48)	125 (45)	66 (55)	0.123
Community classification				
Urban	88 (22)	61 (22)	27 (23)	
Peri-urban	54 (14)	32 (11)	22 (18)	
Rural/regional	258 (65)	188 (67)	70 (59)	0.135
Social Support (ENRICHD Social Support Inventory), median (range)	20 (8-34)	20 (8-31)	21 (9-34)	0.007
Personal Wellbeing Index (% of Scale Maximum), median (range)	68.8 (2.5-100)	67.5 (2.5-100)	70.0 (12.5-100)	0.065
Overall health past four weeks^d		n=256	n=113	
Excellent/very good	181 (45)	120 (47)	61 (54)	
Good/fair	155 (39)	106 (41)	49 (43)	
Poor/very poor	33 (8)	30 (12)	3 (3)	0.011

a: Missing data for one respondent

b: Missing data for two respondents

c: Missing data for three respondents

d: Missing data for 31 respondents

self-reported frequency of any (i.e. licit and/or illicit) alcohol use in the previous four weeks. To reach the final models in both of these analyses, variables with at least a marginal association ($p < 0.10$) with the outcomes on a bivariate level were included. Both analyses controlled for age and sex; interactions between these two factors and others included in the multivariate models (e.g. age, employment and relationship status) were explored but were not significant.

All data analyses were conducted using Stata Version 13 (Statacorp LP, Texas, USA), with a significance level of $p < 0.05$. All reported percentages are rounded to the nearest whole number.

Ethics approval was obtained from the Alfred Health Human Research Ethics Committee (project number: 433/15). Official endorsement was granted from the Solomon Islands' Ministry of Women, Youth, Children and Family Affairs.

Results

Sample characteristics

Four hundred young people were administered the structured questionnaire across the four provinces of interest; 113 participants in Guadalcanal, 105 in Malaita, 83 in Choiseul and 99 in Western province. A median age of 19 years was recorded and most (70%) participants were male and identified as heterosexual (96%; Table 1). Younger participants (i.e. those aged 19 years or less) were significantly more likely to be enrolled in any education at the time of interview (60% vs. 21% of those aged ≥ 20 years; $p < 0.001$). Accordingly, participants aged over 19 years were significantly more likely to be employed (33% vs. 11% of

those aged ≤ 19 years; $p < 0.001$). However, 41% of the entire sample was not enrolled in education or employed at the time of interview.

About two-thirds (67%) of the sample reported currently living with both parents. The median number of people living in the same household in addition to participants was six (range: 1–17).

Although there was no apparent correlation between age and total ESSI (social support) score, female participants (median=21, range: 9–34) were significantly ($p = 0.007$) more likely to record higher levels of self-perceived social support than males (median=20, range: 8–31). Conversely, there was no significant difference in total PWI score between male and female participants, but there was a significant negative correlation between PWI score and age ($p = 0.015$; 95% CI: -1.32 – -0.14).

Substance use

Table 2 displays the percentages of participants who reported lifetime and recent (past four weeks) use of licit and illicit alcohol types and other substances.

Betel nut was the most commonly used substance among the sample in terms of both lifetime and recent use. Most participants reported using it on a daily basis. Although there was no significant difference in betel nut use (ever or recently) according to age ($p = 0.461$ and $p = 0.287$, respectively), it was the only substance for which there was no significant difference in prevalence of lifetime or recent use among male versus female participants (94% vs. 94% [$p = 0.859$] and 90% vs. 84% [$p = 0.105$], for lifetime and recent use, respectively). Males were significantly more likely to have engaged in use of all other substances.

Most respondents reported lifetime use of any type of alcohol (89% males vs. 54% females; $p < 0.001$); licit alcohol was most commonly used by these participants (ever and recently), followed by kwaso and homebrew. The median age of first use of store-bought alcohol was 15 years (range: 6–24 years; this question was not asked for other substances). In consideration of the country's minimum legal drinking age of 21 years, 35% of the sample reported engaging in underage drinking of store-bought alcohol in the month prior to interview.

Despite different numbers of participants reporting use of each alcohol type, all three were used on a median of eight days during the last four weeks (i.e. approximately twice per week). Of participants who reported any recent alcohol consumption ($n = 259$), around two-fifths reported sometimes drinking alone, possibly indicating more problematic alcohol use patterns among this sub-group.

Lifetime and recent use of any alcohol type was significantly more common among participants aged ≥ 20 years compared to younger participants (87% vs. 71% [$p < 0.001$] and 75% vs. 55% [$p < 0.001$], respectively). Specifically, older participants were significantly more likely to use all licit and illicit alcohol types (ever and recently).

Close to half (48%) the total sample reported ever using marijuana (58% males vs. 24% females, $p < 0.001$). Lifetime and recent marijuana use was more frequently reported among participants aged 20–24 versus those aged 15–19 years (57% vs. 39% [$p < 0.001$] and 42% vs. 33% [$p = 0.049$], respectively).

Self-reported use of other substances was minimal. Six per cent of participants reported ever sniffing petrol, with 3% doing so in the last four weeks, and 4% reported

Table 2: Lifetime and recent use of licit and illicit alcohol and other substances among survey participants ($n = 400$).

Substance	Lifetime use ^a			Past four weeks			Median days used past month (range) ^b	Sometimes use alone ^{b,c}
	TOTAL N=400	Males n=281	Females n=119	TOTAL N=400	Males n=281	Females n=119		
Betel nut ^e	374 (94)	263 (94)	111 (93)	351 (88)	259 (90)	99 (83)	28 (2–28)	-
Marijuana ^f	191 (48)	163 (58)	28 (24)	148 (37)	129 (46)	19 (16)	12 (1–28)	-
Tobacco ^f	304 (76)	236 (84)	68 (57)	277 (70)	223 (79)	54 (45)	28 (1–28)	-
Store-bought alcohol	312 (78)	249 (89)	63 (53)	245 (61)	202 (72)	44 (37)	8 (1–28)	89 (36)
Homebrew	199 (50)	179 (64)	20 (17)	132 (33)	117 (42)	15 (13)	8 (1–28)	42 (32)
Kwaso	238 (60)	209 (74)	29 (24)	183 (46)	159 (89)	24 (86)	8 (1–28)	66 (36)
ANY alcohol ^d	315 (79)	251 (89)	64 (54)	259 (65)	213 (76)	46 (39)	-	109 (42)

a: All gender differences were significant ($p < 0.001$) other than betel nut ($p = 0.859$)

b: Among those who had used each substance in the last four weeks

c: Question only asked regarding consumption of different alcohol types

d: I.e., use of store-bought alcohol, homebrew and/or kwaso

e: Missing data for one respondent

f: Missing data for two respondents

lifetime magic mushroom use, with 1% reporting having done so recently. Two per cent reported lifetime use of spray paint; 1% reported use in the last four weeks. One per cent of participants (n=5) reported ever injecting a drug not prescribed by a doctor or other health professional; one participant (<1%) reported doing so recently.

Harmful alcohol use

A total of 177 participants reported engaging in harmful alcohol use (i.e. typically consuming >6 drinks per session) in the previous four weeks. Table 3 displays the final multivariate logistic regression model for factors associated with harmful consumption levels of licit/store-bought alcohol in the past four weeks among participants who reported drinking such alcohol (n=245). Three factors (i.e. residential location, relationship status and self-reported overall health in the past four weeks) were found to be independently associated with usually consuming more than six licit alcoholic drinks per session during that time. Employment, age and sex were not significantly associated with harmful use of store-bought alcohol in the final model.

Alcohol use frequency

Table 4 displays the final multiple linear regression model for factors associated with frequency of licit and illicit alcohol consumption in the previous four weeks. Similar to the results above, a higher frequency of alcohol use was significantly associated with being married/de facto compared to being single. Living with neither parent was negatively associated with higher alcohol use frequency during that time compared to living with one parent. Reporting lifetime use of marijuana was positively associated with frequency of alcohol consumption in the past four weeks.

Discussion

We sought to examine the prevalence and frequency of alcohol and other substance use among 400 young people recruited from targeted locations across four provinces of the Solomon Islands. Our sample reported higher levels of substance use compared to samples recruited for previous research in the Solomon Islands (note that the extent to which our sample was representative of the general population of interest is unknown). For example, among WHO STEPS respondents aged 15–24 years in 2006, 78% of males and

66% of females reported chewing betel nut at least once in the previous year,² whereas 88% of our total sample (90% of males and 84% of females, respectively, within the same age range) reported use in the previous four weeks alone. Further, about 70% of our sample reported recent tobacco use, mainly on a daily basis; in comparison, 22% of respondents to the recent Household Income and Expenditure Survey aged 10 years and over (from close to 4,500 households) reported using tobacco in the previous week.⁴ Similarly, while only 7% of Household Survey respondents reported drinking unspecified alcohol types in the past week,⁴ around two-thirds of our sample reported drinking licit and/or illicit alcohol in the past four weeks on a median of eight occasions (i.e. about twice/week). In this instance, even if only licit alcohol is taken into account (i.e. if illicit alcohol was not explicitly considered by the Household Survey), a higher percentage (60%) of our sample reported consuming store-bought drinks in the last four weeks. Due to the lack of disaggregated findings presented in the Household Income and Expenditure Survey report, generating comparisons between our sample and Household Survey participants in the same age bracket is inherently difficult. However, consistent with anecdotal information from stakeholders we consulted, the high rate of alcohol consumption among our sample could be indicative of greater levels of alcohol consumption among young people in the Solomon Islands compared with the country's general population, which would be a significant public health concern. People engaging in heavy alcohol use patterns are at risk of experiencing numerous short- and long-term related harms which can have pervasive effects on individuals, families and communities. Prevalent harmful alcohol consumption could also result in costly and preventable impacts on the country's limited health, social support and legal systems. Further research investigating the true extent of alcohol use – including illicit alcohol consumption patterns and related harms – among young Solomon Islanders is therefore warranted.

Among participants who reported past-month alcohol consumption, we aimed to identify factors that were associated with participants engaging in more harmful alcohol use patterns. The association between rural location and heavier store-bought alcohol consumption conflicts with findings

Table 3: Factors independently associated with typically consuming more than six store-bought (licit) alcoholic drinks per session in the last four weeks.

	Adjusted Odds Ratio	95% Confidence Interval
Age		
<19 years	1	-
20+ years	1.50	0.75–2.96
Sex		
Male	1	-
Female	0.72	0.32–1.65
Employment status		
Unemployed	1	-
Employed	2.18	0.94–5.07
Residential location		
Urban/peri-urban	1	-
Rural	2.26	1.14–4.45*
Relationship status		
Married/de facto	1	-
Stable/steady relationship (not living together)	0.24	0.06–0.91*
Single	0.21	0.05–0.84*
Overall health past four weeks		
Excellent/very good	1	-
Good/fair	3.29	1.63–6.61*
Poor/very poor	2.40	0.76–7.55

* $p < 0.05$

Table 4: Factors independently associated with frequency of any alcohol consumption in the four weeks prior to interview.

	β	95% Confidence Interval
Age		
<19 years	1	-
20+ years	0.21	-1.55 – 1.98
Sex		
Male	1	-
Female	0.17	-2.04 – 2.38
Relationship status		
Married/de facto	1	-
Stable/steady relationship	-2.53	-5.12 – 0.05
Single	-3.36	-6.09 – -0.63*
Overall health past four weeks		
Excellent/very good	1	-
Good/fair	0.84	-0.99 – 2.66
Poor/very poor	2.25	-0.58 – 5.08
Live with parents?		
Yes, one parent	1	-
No, neither	-4.08	-6.87 – -1.30*
Yes, both parents	-1.07	-3.27 – 1.13
Highest level education completed		
<Primary (incl. no education)	1	-
Primary	-1.47	-3.77 – 0.83
Secondary/tertiary	-2.01	-4.60 – 0.57
Lifetime marijuana use (yes)	2.09	0.25 – 3.92*

* $p < 0.05$

from the country's Household Survey, which indicated a higher prevalence of use among respondents residing in urban areas (including greater alcohol-related expenditure in such locations).⁴ As noted above, the Household Survey's aggregated findings (in addition to a lack of information regarding type, frequency and amount of alcohol consumed) make it difficult to identify any trends associated with specific age groups; therefore, it is possible that youth in rural locations engage in heavier store-bought alcohol use patterns than their urban/peri-urban counterparts.

Interestingly, participants who reported being married/living with their partner were significantly more likely to report both consuming a greater amount of licit/store-bought drinks and a higher frequency of any alcohol use in the past four weeks than their non-married/non-de facto counterparts (oddly enough, living with neither parent was significantly associated with a reduced frequency of any alcohol consumption in the past four weeks compared to participants who lived with just one parent). Given that there were no interactions identified between relationship status and other factors such as age, sex and employment, we are unsure about explanations for these findings. It is possible that other cultural factors not investigated by our study played a role in such findings, and this warrants further research. Regardless, these findings could be important for developing targeted interventions for specific sub-groups such as married couples, particularly in consideration of previous research in the Solomon Islands which demonstrated high levels of domestic violence nationwide, and the common role of alcohol in such cases.²⁰

Our findings suggest that intervention and education initiatives are needed to prevent early initiation of alcohol and other substance use among young Solomon Islanders and the progression to more harmful use patterns, and to disseminate information about the potential consequences of substance use. For example, researchers have previously suggested a multi-pronged approach to tackling tobacco use in the Solomon Islands is needed, including enhancing bans on advertising, establishing a national telephone cessation support 'quitline', and increasing the number of public locations where tobacco use is prohibited.²¹ Efforts targeting specific sub-groups (e.g. rural/regional communities or males) could also be beneficial.

Additionally, in the context of limited funding and resources for the country's healthcare sector,²² leveraging informal mechanisms or processes could be an efficient and effective means of addressing problematic alcohol and other substance use in the Solomon Islands. This might entail equipping community leaders and gatekeepers with appropriate knowledge and skills to prevent and respond to such issues, e.g. informing them of available services and appropriate referral mechanisms. Prevention and harm reduction approaches can disrupt transitions to more frequent and heavy use patterns by addressing factors associated with alcohol and other substance consumption and related personal and societal costs, such as involvement in criminal and other antisocial and risk behaviours.^{1,8,23}

Limitations

The targeted and convenience sampling methods used for recruiting participants mean that the sample might not be representative of young people in the provincial communities, or of young people in the Solomon Islands generally (participants were recruited from only four of the country's nine provinces). In this context, it is possible that 'hidden' members of the target population might not have been accessed. The cross-sectional nature of our study precluded the investigation of temporal relationships and causality between factors associated with, or predictive of, outcomes of interest. The data collection process for our study means that the data were possibly subject to social desirability bias and recall bias; however, respondents were informed that their participation or refusal to participate would not affect any ongoing service provision. The translation from English to Pijin (in addition to other difficulties with local dialects) might have resulted in the loss of accurate context or meaning with some questions. Our inability to accurately measure amounts of illicit alcohol consumed by participants (in addition to the potency of such alcohol) may have resulted in underestimates of harmful alcohol consumption among the sample. Lastly, difficulties in data collection in remote areas (e.g. the use of hardcopy versus electronic data recording and entry, monitoring local fieldworkers on a full-time basis and reminding them to record non-responses) precluded the generation of a reliable non-response rate.

Conclusion

Our study addressed important knowledge and data gaps around the consumption of alcohol and other substances among young people in the Solomon Islands. Crucially, our sample frequently reported consumption of tobacco and both licit and illicit alcohol types. Additionally, harmful alcohol use patterns were common, even though we suspect such patterns were underestimated. Evidence-based initiatives to address early initiation of substance use and the progression to more problematic use patterns need to be explored. These could entail better equipping stakeholders and services with appropriate and adequate information and resources to respond to such issues. Future research could further explore illicit alcohol use and associated consequences among young people and the wider population in the Solomon Islands.

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References

1. Power R, Schmich L, Nosa V. A response for substance and harm reduction in pacific island countries and territories. *Harm Reduct J*. 2015;12(1):48.
2. World Health Organization. *Solomon Islands NCD Risk Factors STEPS REPORT*. Suva (FJI): WHO Western Pacific Region; 2010.
3. World Health Organization. *Global School-based Student Health Survey Solomon Islands: Fact Sheet* [Internet]. Geneva (CHE):WHO; 2011 [cited 2103 Apr 18]. Available from: http://www.who.int/chp/gshs/2011_GSHS_FS_Solomon_Islands.pdf
4. Solomon Islands National Statistics Office, *Solomon Islands 2012/13 Household Income and Expenditure Survey: National Analytical Report (Volume 1)*. Honiara (SLB): Ministry of Finance and Treasury Solomon Islands National Statistics Office; 2015.

5. Agius P, Taft A, Hemphill S, Toumbourou J, McMorris B. Excessive alcohol use and its association with risky sexual behaviour: A cross-sectional analysis of data from Victorian secondary school students. *Aust N Z J Public Health*. 2013;37(1):76-82.
6. Thompson KD, Stockwell T, MacDonald S. Is there a 'low-risk' drinking level for youth? The risk of acute harm as a function of quantity and frequency of drinking. *Drug Alcohol Rev*. 2012;31(2):184-93.
7. Schmich L, Power R. *Situational Analysis of Drug and Alcohol Issues and Responses in the Pacific 2008-09*. ANCD Research Paper 21. Canberra (AUST): Australian National Council on Drugs; 2010.
8. Jourdan C. *Youth and Mental Health in Solomon Islands: A Situational Analysis: Tingting Helti, Tingting Sikil*. Suva (FJI): Foundation of the Peoples of the South Pacific International; 2008.
9. Kuschel R, Takiika AFT, Angiki K. Alcohol and Drug Use in Honiara, Solomon Islands: A Cause for Concern. In: Marsella AJ, Austin AA, Grant B, ed. *Social Change and Psychosocial Adaptation in the Pacific Islands: Cultures in Transition*. New York (NY): Springer; 2005. p. 211-54.
10. Natuzzi ES. Bullets, betel nut, and bacteria: Medicine in the Solomon Islands. *Bull Am Coll Surg*. 2010;95(3):16-23.
11. World Health Organization. *Review of Areca (Betel) Nut and Tobacco Use in the Pacific: A Technical Report*. Manila (PHL): WHO Western Pacific Region; 2012.
12. Kuther TL. Medical decision-making and minors: Issues of consent and assent. *Adolescence*. 2003;38(150): 343-58.
13. Mitchell PH, Powell L, Blumenthal J, Norten J, Ironson G, Pitula CR et al. A short social support measure for patients recovering from myocardial infarction: The ENRICH Social Support Inventory. *J Cardiopulm Rehabil*. 2003;23(6):398-403.
14. Bowling A. Just one question: If one question works, why ask several? *J Epidemiol Community Health*. 2005;59(5):342-5.
15. International Wellbeing Group. *Personal Wellbeing Index*. 5th ed. Melbourne (AUST): Deakin University Australian Centre on Quality of Life; 2013.
16. Central Intelligence Agency. *The World Factbook 2016-17* [Internet]. Fairfax (VA): CIA; 2016 [cited 2016 Jul 13]. Available from: <https://www.cia.gov/library/publications/the-world-factbook/index.html>
17. Pacific Islands Legal Information Institute. *Criminal Law in Solomon Islands: Chapter 50: Liquor Act*. Port Vila (VUT): University of the South Pacific School of Law; 1978 [cited 2017 Jan10]. Available from: <http://www.pacii.org/sb/criminal-law/ch50-liquor-act.htm>
18. Kessaram T, McKenzie J, Girin N, Roth A, Vivili P, Williams G, et al. Alcohol use in the Pacific region: Results from the STEPwise approach to surveillance, Global School-Based Student Health Survey and Youth Risk Behavior Surveillance System. *Drug Alcohol Rev*. 2015;35(4): 412-23.
19. EuroQol Group. *EuroQol - a new facility for the measurement of health-related quality of life*. Health Policy. 1990;16:199-208.
20. Secretariat of the Pacific Community. *Solomon Islands Family Health and Safety Study: A Study on Violence Against Women and Children* [Internet]. Noumea (NCL): SPC; 2009 [cited 2015 Aug 25]. Available from: http://www.spc.int/hdp/index2.php?option=com_docman&task=doc_view&gid=49&
21. World Lung Foundation. *The Tobacco Atlas: Solomon Islands Factsheet* [Internet]. New York (NY): WLF; 2015 [cited 2016 Jul 7]. Available from: <http://www.tobaccoatlas.org/country-data/solomon-islands/>
22. Hodge N, Slatyer B, Skiller L. Solomon Islands Health System Review. *Health Syst Transit*. 2015;5(1).
23. Blignault I, Bunde-Birouste A, Ritchie J, Silove D, Zwi AB. Community perceptions of mental health needs: A qualitative study in the Solomon Islands. *Int J Ment Health Syst*. 2009;3(1):6.