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To cite this article: Kennedy Amone-P'Olak, Wilfred Chilunga, Bernard Omech & Phillip Renison Opondo (2019): Knowledge of alcohol-disease links and socio-demographic factors as predictors of support for alcohol-related policies among university students in Botswana, *Drugs: Education, Prevention and Policy*, DOI: [10.1080/09687637.2019.1664994](https://doi.org/10.1080/09687637.2019.1664994)

To link to this article: <https://doi.org/10.1080/09687637.2019.1664994>



Published online: 23 Sep 2019.



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Knowledge of alcohol-disease links and socio-demographic factors as predictors of support for alcohol-related policies among university students in Botswana

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ABSTRACT

Background: Worldwide, harmful alcohol use is causally related to about 60 diseases and is linked to about 3.3 million deaths annually. Yet, awareness of alcohol-disease links is low.

Objective: This study aims to assess socio-demographic characteristics and knowledge of alcohol-disease links as predictors of support for alcohol-related policies.

Methods: A survey of 615 university students (age = 19.8; SD = 1.6; 18–25) in Botswana assessed alcohol use and knowledge of alcohol-disease links as predictors of support for alcohol-related policies. T-tests and regression analyses were performed to estimate differences and predictors.

Results: Forty per cent of respondents ($n = 245$) use alcohol, 38% ($n = 93$) of whom were hazardous users. Awareness of alcohol-disease links was low for diabetes (39%) and cancer (41%) but high for liver cirrhosis (89%) and injuries (87%). Female gender (relative to male) ($\beta = 0.19$, 95% CI: 0.11, 0.27), harmful alcohol use ($\beta = -0.49$, 95% CI: -0.56 , -0.42), higher maternal education ($\beta = 0.11$, 95% CI: 0.02, 0.18), and more knowledge of alcohol-disease links ($\beta = 0.13$, 95% CI: 0.05, 0.21) predicted support for policies.

Conclusions: Awareness of alcohol-disease links was low. Support for policies was predicted by being female (relative to male), reporting no harmful alcohol use, having more educated mothers, and knowledge of alcohol-disease links. Improving awareness of alcohol-disease links could be an effective intervention to increase support for alcohol-related policies.

ARTICLE HISTORY

Received 26 February 2019

Revised 28 August 2019

Accepted 3 September 2019

KEYWORDS

Diseases; alcohol policy; support; Botswana

Introduction

Worldwide, harmful alcohol use is causally related to about 60 diseases and a risk factor to about 200 other health conditions (Global Status Report on Alcohol and Health, 2018). The global burden of diseases and injuries associated with the harmful use of alcohol is estimated at 3.3 million deaths a year (Global Status Report on Alcohol and Health, 2018). Furthermore, harmful use of alcohol plays a causal role in several diseases such as liver cirrhosis (Buykx, Gilligan, Ward, Kippen, & Chapman, 2015) heart diseases (Ronksley, Brien, Turner, Mukamal, & Ghali, 2011), cancers (Zhao, Stockwell, Roemer, & Chikritzhs, 2016) and a risk factor to HIV/AIDS (Rehm et al., 2017). Besides, harmful alcohol use is associated with reduced social care, loss of productivity, increased crime (Casswell & Thamarangsi, 2009; Mohapatra, Patra, Popova, Duhig, & Rehm, 2010), and domestic violence (Tsai et al., 2011). In this study, harmful alcohol use is defined as 'drinking at levels that lead to significant harm to physical and mental health and at levels that may cause substantial harm to others'. Consequently, harmful alcohol use does not only have adverse implications for overall health but is a social burden as well.

Given the health and social burden of harmful alcohol use, many governments around the world have come up with different policy initiatives to regulate the alcohol industry and individual freedoms to use alcohol. Such policy initiatives include restricting availability, marketing, setting age limits, treatment for heavy users, protecting those affected by harmful alcohol use, and the education and provision of information on health risks associated with harmful alcohol use (World Health Organization, 2014). Particularly in the middle- and low-income countries such as Botswana, most policy initiatives are designed to tackle the supply more than the demand for alcohol. Awareness and knowledge of alcohol-disease links may inform interventions aimed at mitigating factors that shape the harmful use of alcohol. Awareness and knowledge of alcohol-disease links may inform interventions aimed at reducing the harmful use of alcohol. Previous studies indicate that mass media health campaigns lead to changes in knowledge, attitude, and beliefs about alcohol (Young et al., 2018).

Botswana has a population of about 2.3 million with a land mass the size of France. Due to its strong economy and a gross domestic product (GDP) of US\$7,877.00, Botswana is categorised as an upper middle-income country (World

Economic Outlook Database, 2018). Despite the excellent economic performance, HIV/AIDS continues to be a significant public health problem with the latest prevalence in the adult population (15–49 years) estimated at 21.9% (Global AIDS Monitoring (UNAIDS/WHO/UNICEF), Spectrum estimates (UNAIDS/WHO) and WHO HIV Country Intelligence Tool, 2017). In addition to the ravages of the HIV/AIDS pandemic, anecdotal reports indicate that harmful alcohol use is a public health concern (Pitso & Obot, 2011). The per capita consumption of pure alcohol in adults (15+ years) is 8.4 litres, higher than the WHO African regional average of 6.3 litres (Global Status Report on Alcohol and Health, 2018). Moreover, the urban population is reported to spend about 21% of their income on alcohol (Central Statistics Office, 1997). The prevalence of alcohol use disorders and harmful use of alcohol is said to be 7.1%, nearly double the WHO Africa regional average of 3.7% (Global Status Report on Alcohol and Health, 2018). Heavy episodic drinking (i.e., consuming 60 grams or more of pure alcohol on at least one sitting in the past 30 days) is estimated at 19% in the general population and 59.4% among drinkers only aged 15 and above (Global Status Report on Alcohol and Health, 2018). Besides the health risks, hazardous alcohol use accounts for 54.7% of liver cirrhosis, 35.4% of road traffic accidents (Global Status Report on Alcohol and Health, 2018), is the primary driver of the spread of HIV/AIDS through risky sexual behaviours and is associated with domestic and sexual violence, especially against women (Tsai et al., 2011).

As a result of the health risks and social problems attributed to harmful alcohol use, the then President of Botswana proposed to introduce a 70% levy on alcohol products in 2008 (Pitso & Obot, 2011; The Republic of Botswana, 2008). The levy was later reduced to 30% (The Republic of Botswana, 2008). The proposal to levy a tax on alcohol, popularly known as the 'Alcohol Levy', aimed to curb alcohol abuse, excessive drinking, underage drinking and intoxication, and to regulate the availability of alcohol (Pitso & Obot, 2011; The Republic of Botswana, 2008). Botswana has well-written national policies and action plans such as legal minimum age and premise for alcohol sales, maximum permissible blood alcohol concentration when driving a vehicle (World Health Organization, 2014). Notwithstanding these policies and action plans, enforcement remains poor (Ferreira-Borges, Esser, Dias, Babor, & Parry, 2015). Public health approach to reducing demand for alcohol, especially among the youth, is nearly absent with poor support for community action. For example, students in institutions of higher learning are of particular interest because of their unique alcohol consumption culture, which requires preventive strategies. Similarly, alcohol abuse among university students impedes upward social mobility and hinders human resource development for the country. Alcohol abuse is associated with poor grades, school drop-out, road accidents, and drives the spread of HIV/AIDS. These associations impact on the quality of the future human resources and subsequent economic development.

Generally, alcohol policies that result in price increases and restrict access receive less support globally (Moskalewicz, Wiczorek, Karlsson, & Österberg, 2013). Other factors such as

being female, older age, and abstinence or using less alcohol are associated with support for alcohol-related policies (Li et al., 2017; Pechey, Burge, Mentzakis, Suhrcke, & Marteau, 2014). However, gender, age, and using less or no alcohol are mostly non-modifiable factors that are not helpful for purposes of designing interventions. Modifiable factors that are related to support for alcohol-related policies include enforcement of existing policies, education and awareness. For example, higher education and knowledge are associated with more support for policies such as price increases and access restriction (Esser & Jernigan, 2018; Li et al., 2017). Also, awareness of the social and health impacts of harmful alcohol use such as crime, domestic violence, cancers, and heart diseases is linked to more significant support for alcohol policies such as price increases and restriction on availability (Li et al., 2017). Consequently, factors such as knowledge and awareness of possible social and health risks are important determinants of public support for alcohol policies. Moreover, education and awareness are modifiable factors that may provide a window of opportunity for intervention to enhance public support for alcohol policies.

Specifically, the study aimed to assess: (1) alcohol use, (2) awareness of the health risks associated with harmful alcohol use, (3) support for alcohol policies, and (4) predictors of support for alcohol-related policies. To adopt a public health approach to reduce risks associated with hazardous consumption of alcohol among the youth, knowledge about the health risks associated with harmful alcohol use and predictors of support for alcohol policies are crucial for designing interventions.

Method

Design and sample

The study utilised a cross-sectional survey of students at a public university in Botswana. Altogether, 658 students took part in the survey. However, data from 43 students were excluded because of incomplete or invalid responses. Consequently, data from 615 students were used in the analyses representing 93.5% of those who took part in the study. Data were collected between August and October 2018 using questionnaires. The sample size was determined by a realistic assessment of the number of students enrolled in various faculties without performing power calculations.

The quota sampling strategy was used to draw participants from the various faculties where students are registered and to ensure the sample was representative of the population of the different faculties of the university. The sample size was based on student enrolment by faculty.

Measurements and data collection procedures

Demographic information

The socio-demographic characteristics assessed included age, gender, maternal and paternal educational attainment (never went to school, primary, secondary, vocational, and tertiary education), place of upbringing (urban, rural, or both), academic performance indicated by different levels of cumulative

grade point average (CGPA: pass, second class lower, second class upper, and first class) and type of secondary schools attended (public, private, or both).

Alcohol policies

A list of 20 alcohol-related policy statements was used to assess support for alcohol policies. Participants responded to the following question: 'To what extent would you support or oppose the following policies to reduce the problems linked to harmful alcohol use?' followed by the list of alcohol-related policy statements. Some of the alcohol-related policy statements were adapted from the Australian National Drug Strategy Household Survey (Australian Institute of Health and Welfare, 2011) and a UK survey (Li et al., 2017) while others were self-made. The alcohol-related policies covered four specific domains: (1) *price and availability*, (2) *marketing and information*, (3) *harm reduction*, and (4) *drink-driving*.

Awareness of the link between harmful alcohol use and diseases

Awareness of the risks of harmful alcohol use and diseases were assessed in two stages. First, by an open question; 'which, if any, health conditions do you think can result from drinking too much alcohol?' Respondents were expected to list, unprompted, health conditions for which harmful alcohol use was a risk factor. Second, the respondents were, later on towards the end of the questionnaire, asked to indicate which, if any of the ten listed (prompted) health conditions would result from harmful use of alcohol. Respondents were required to indicate 'yes' = 2, 'no' = 1, and 'don't know' = 0. Harmful alcohol use is a known risk factor for all the known health conditions on the list (Global Status Report on Alcohol and Health, 2018).

Alcohol use

Alcohol Use Disorders Identification Test (AUDIT) was used to assess alcohol use. The AUDIT (Saunders, Aasland, Babor, De la Fuente, & Grant, 1993) is a 10-item self-report measure for screening risky drinking habits (e.g., 'How many drinks containing alcohol do you have on a typical day when you are drinking?'). The AUDIT is a standard measure for identifying harmful alcohol use in primary health care and among the general population. The items on the AUDIT scale are scored from 0 to 4, with the total scores ranging from 0 to 40. Scores of 8 and above are generally considered indicative of harmful or likely alcohol dependence (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Saunders et al., 1993). The internal consistency of the AUDIT scale for this study was acceptable ($\alpha = .81$).

Questionnaires were used to collect data from different lecture rooms in different faculties where students are enrolled. Research assistants got permission from faculty administrators of the faculties and lecturers to collect data from their respective lecture rooms. Before the questionnaires were distributed, the objectives of the study were explained,

respondents were informed that participation was voluntary and that the information they would provide would be treated with utmost confidentiality and anonymity. Respondents comprised students enrolled in different faculties at different levels of study (i.e., year 1 till year 5). Respondents completed the questionnaire in about 10 minutes in the presence of the research assistants who helped to clarify any query that the respondents could have. Finally, analyses were based on data obtained from 615 students (55% female; $n = 378$) with an average age of 19.84 (SD = 1.64) and a minimum age of 18 and maximum of 25.

Ethical considerations

First, permission to conduct the study was granted by the Institutional Review Board of the University of Botswana. Next, the objectives of the study were explained, and respondents were guaranteed confidentiality and anonymity. Finally, respondents were debriefed after data collection and information on psychological support services within and outside the university were provided for those who may have been affected by the study. Expressly, contact telephone numbers for the Psychology Clinic and Student Counselling Centre, both located within the University of Botswana campus, were provided to the students.

Statistical analyses

Descriptive statistics were computed to assess the prevalence of alcohol use, levels of support for alcohol-related policies, and awareness of the link between harmful alcohol use and risk for diseases. *T*-tests were performed to assess gender differences in alcohol use and support for alcohol-related policies. Furthermore, univariable regression models were fitted to determine the extent to which socio-demographic characteristics (e.g., gender, age, place of upbringing, type of school attended, academic performance, parental educational attainment) and the extent to which knowledge of alcohol-disease links predicts support for overall alcohol-related policies and four specific domains of the alcohol-related policies. To group the policy items into the factors that form alcohol-related support, principal component analysis (PCA) was performed with the 20 policy items obliquely rotated (Promax) to permit correlations between factors (Field, 2017). In the end, the following four factors were extracted: pricing, availability, drink-driving, and advertising/marketing. The four PCA factor scores were then used as dependent variables with gender, age, place of upbringing, types of the school attended, alcohol use, academic performance, maternal education and knowledge of alcohol-disease links as predictors in four linear regression analyses corresponding to the four policy domains extracted in PCA. Finally, multivariable regression analyses were fitted to assess the unique and independent effects of socio-demographic characteristics, alcohol use and knowledge of alcohol-disease links would predict support for overall alcohol-related policies and four specific domains of the alcohol-related policies. Data analyses were conducted using IBM SPSS statistical software, version 25 for

Windows (IBM Corp, 2017). The p -values of less than .05 were considered statistically significant.

Results

The socio-demographic characteristics of the study participants are presented in Table 1. Participants included 378 female students (61.5%) and were, on average, 19.8 years of age ($SD = 1.6$; 18–25). Altogether, 40% ($n = 245$) reported that they use alcohol. Among the alcohol users, 38% ($n = 93$) reported harmful use (i.e., AUDIT score ≥ 8). In general, support was stronger for *drink-driving* and *harm reduction* domains of alcohol-related policies than for *prices and availability* and *marketing and information* domains of alcohol-related policies.

After inquiring about health conditions associated with harmful use of alcohol, awareness was generally low except for liver cirrhosis, which was mentioned by about 67% of the respondents (see Figure 1). When a list of potential diseases related to harmful use of alcohol was presented to the respondents (i.e., when they were prompted), awareness improved for liver cirrhosis, injuries, heart disease, and high blood pressure but awareness of alcohol-disease links remained below 50% for diabetes, stroke, respiratory diseases, cancer, and pancreatitis (Figure 1).

Support for alcohol-related policies were stronger for *drink-driving* (e.g., random breath alcohol testing for drivers) and *harm reduction* (e.g., health workers asking about alcohol use and offering advice) domains of the policies than *price and availability* (e.g., increasing the cost of alcohol) and *marketing and information* (e.g., banning alcohol companies from sponsoring sporting events) domains (Figure 2).

Results of univariable regression analyses of the socio-demographic characteristics of the predictors of support for alcohol-related policies are presented in Table 2. Overall, four factors consistently predicted all domains of alcohol-related policies: gender, alcohol use, maternal education, and knowledge of alcohol-disease links (Table 2). Female students significantly scored higher than their male counterparts on all domains of alcohol-related policy domains (Table 1). Support for alcohol-related policies was significantly higher among non-consumers than consumers of alcohol and low among students with low maternal educational attainment. Finally, knowledge of alcohol-disease links significantly predicted nearly all domains of alcohol-related policies (Table 2). Each regression coefficient represents the number of SD change in the outcome variable per SD change of the independent variable. For example, the regression of total support for alcohol-related policies on alcohol use means that a change of 1 SD in alcohol use is associated with a -0.51 SD change in support for alcohol-related policies. The proportion of explained variance for the models ranged from $R^2 = 0.04$ ($F_{(2,613)} = 22.32$, $p < .01$) when gender was regressed on support for alcohol policies to $R^2 = 0.21$ ($F_{(2, 613)} = 154.05$, $p < .001$) when alcohol use was regressed on support for alcohol policies.

Results of the multivariable regression analysis to assess the unique and independent effects of alcohol use, knowledge of alcohol-disease links and socio-demographic characteristics on alcohol-related policies are presented in Table 3. Preliminary moderation analyses of gender and age with the predictors were not significant. As in the univariable regression analyses, gender, alcohol use, and knowledge of alcohol-disease links consistently predicted all domains of alcohol-related policies (Table 3). Each regression coefficient

Table 1. Socio-demographic characteristics of the sample in the study.

Variables	Total ($N = 615$, 100%)	Female ($n = 378$, 61.50%)	Male ($n = 237$, 38.50%)	t -test
Age (M , SD , 18–25)	19.8 ($SD = 1.6$; 18–25)	19.7 ($SD = 1.5$; 18–25)	20.1 ($SD = 1.8$; 18–25)	$t(613) = 2.62$, $p < .05$
Place of upbringing				
Urban setting (relative to urban rural setting)	300 (48.8)	180 (60.0)	120 (40.0)	
Rural setting	315 (51.2)	192 (61.0)	123 (39.0)	
Type of secondary school attended				
Public school (relative to private school)	510 (82.9)	317 (62.2)	183 (37.8)	
Private school	105 (17.1)	61 (58.1)	44 (41.9)	
Academic performance (CGPA/5)				
2.00–2.99	146 (23.7)	83 (22.0)	63 (26.6)	
3.00–3.99	284 (46.2)	187 (49.5)	97 (40.9)	
4.00–4.69	111 (18.0)	64 (16.9)	47 (19.9)	
4.70+	75 (12.1)	43 (11.4)	32 (13.5)	
Maternal educational attainment				
No formal education (n , %)	27 (4.4)	12 (44)	15 (56)	
Primary education (n , %)	58 (9.4)	38 (65.5)	20 (34.5)	
Secondary education (n , %)	173 (28.1)	109 (63)	64 (37)	
Vocational education (n , %)	79 (12.8)	48 (61)	31 (39)	
University education (n , %)	278 (45.2)	173 (62)	105 (38)	
Alcohol use				$t(613) = 2.27$, $p < .05$
Yes (n , %)	245 (40)	135 (35)	110 (46)	
No (n , %)	370 (60)	239 (65)	131 (54)	
Non-hazardous (AUDIT score < 8) (n , %)	152 (62)	99 (65)	53 (35)	
Hazardous (AUDIT score ≥ 8) (n , %)	93 (38)	32 (34)	51 (66)	
Support for policies (total score) (M , SD , min–max)	3.4 (0.73; 1–5)	3.5 (0.71; 1–5)	3.3 (0.73; 1–5)	$t(613) = 4.29$, $p < .05$
Price and availability (M , SD , min–max)	3.3 (0.99; 1–5)	3.5 (0.95; 1–5)	3.1 (1.03; 1–5)	$t(613) = 4.83$, $p < .05$
Marketing and information (M , SD , min–max)	3.2 (0.79; 1–5)	3.3 (0.79; 1–5)	3.2 (0.77; 1–5)	$t(613) = 2.16$, $p < .05$
Harm reduction (M , SD , min–max)	3.6 (0.81; 1–5)	3.7 (0.78; 1–5)	3.5 (0.84; 1–5)	$t(613) = 2.36$, $p < .05$
Drink-driving (M , SD , min–max)	4.0 (0.97; 1–5)	4.1 (0.94; 1–5)	3.8 (1.00; 1–5)	$t(613) = 3.20$, $p < .05$
Knowledge of alcohol-disease link (M , SD)	12.2 (4.7; 0–20)	12.2 (4.5; 0–20)	12.2 (5.0; 0–20)	$t(613) = 0.13$, $p > .05$

AUDIT: Alcohol Use Disorders Identification Test; N : total sample, n : subpopulation sample; %: per cent; min: minimum score; max: maximum score; ns: not significant; CGPA: Cumulative Grade Point Average

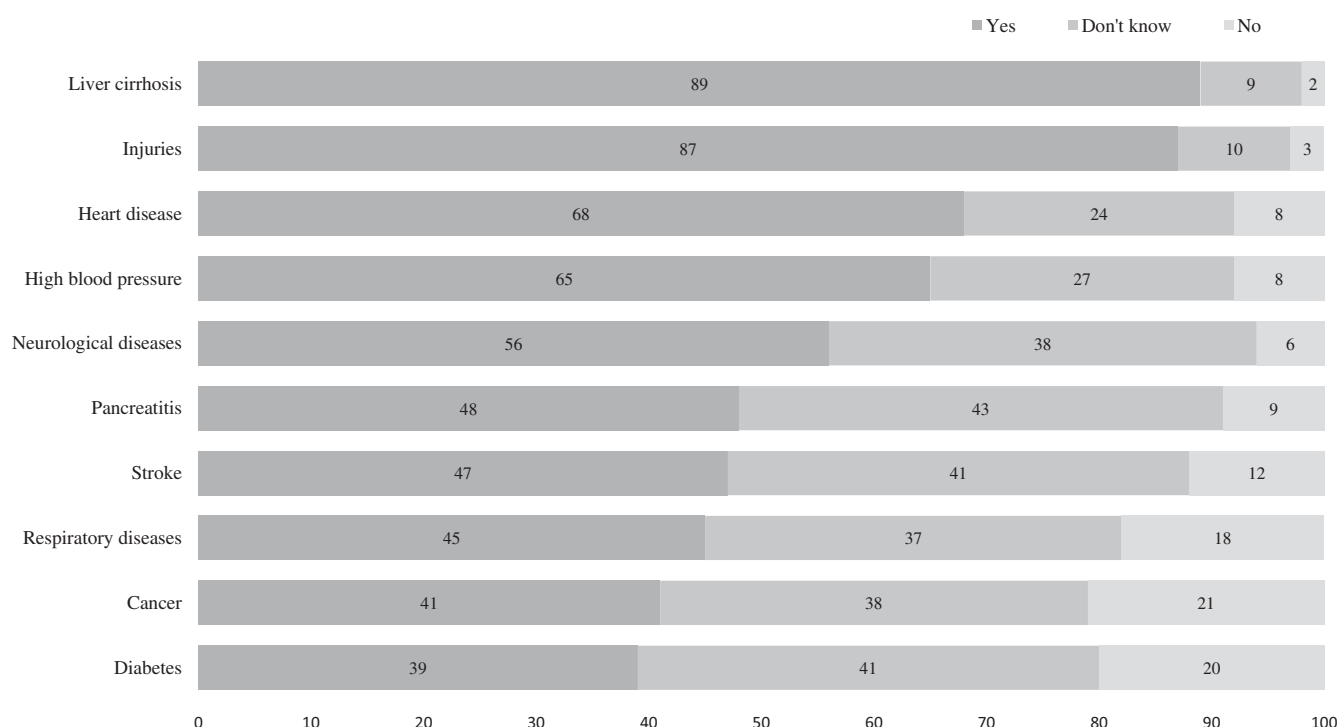


Figure 1. Knowledge of alcohol-disease link (%).



Figure 2. Level of support for alcohol-related policies (%).

represents the number of SD change in the outcome variable per SD change of the independent variable. For example, the regression of total support for alcohol-related policies on alcohol use means that a change of 1 SD in alcohol use is independently and uniquely associated with a -0.49 SD change in support for price and availability domain of

alcohol-related policies. The proportion of explained variance for the multivariable regression analyses is presented in Table 3. Generally, the proportion of explained variance increased for all multivariable regression analyses indicating improved model fit (Table 3) from the univariable regression analyses.

Table 2. Univariable regression analyses: predictors of support for alcohol-related policies ($N = 615$).

Predictors	Price and availability β (95% CI)	Marketing and information β (95% CI)	Harm reduction β (95% CI)	Drink-driving β (95% CI)	Total support β (95% CI)
Female gender (relative to male)	0.21 (0.13, 0.28)***	0.10 (0.02, 0.17)*	0.11 (0.03, 0.19)**	0.13 (0.05, 0.21)**	0.19 (0.11, 0.27)***
Age	-0.07 (-0.14, 0.02) ns	-0.02 (-0.06, 0.10) ns	-0.06 (-0.14, 0.02) ns	-0.10 (-0.18, -0.03)*	-0.06 (-0.14, 0.02) ns
Alcohol use (relative to non-alcohol use)	-0.51 (-0.61, -0.47)***	-0.31 (-0.38, -0.23)***	-0.30 (-0.37, -0.22)***	-0.22 (-0.30, -0.15)***	-0.49 (-0.56, -0.42)***
Academic performance	0.01 (-0.09, 0.10) ns	0.02 (-0.12, 0.08) ns	-0.02 (-0.12, 0.08) ns	0.04 (-0.06, 0.14) ns	-0.01 (-0.10, 0.10) ns
Maternal educational attainment	0.12 (0.04, 0.20)**	0.10 (0.01, 0.17)*	0.01 (-0.08, 0.08)	0.04 (-0.05, 0.12)	0.11 (0.02, 0.18)**
Knowledge of alcohol-disease link	0.11 (0.03, 0.19)**	0.13 (0.05, 0.21)**	0.09 (0.01, 0.16)*	0.06 (-0.02, 0.14)	0.13 (0.05, 0.21)**

*** $p < .001$; ** $p < .01$; * $p < .05$; β : standardised beta; CI: confidence interval; ns: not significant.

Table 3. Multivariable regression analysis: predictors of support for alcohol-related policies ($N = 615$).

Predictors	Price and availability β (95% CI)	Marketing and information β (95% CI)	Harm reduction β (95% CI)	Drink-driving β (95% CI)	Total support β (95% CI)
Female gender (relative to male)	0.17 (0.10, 0.24)***	0.08 (0.01, 0.16)*	0.09 (0.01, 0.17)*	0.12 (0.04, 0.20)**	0.16 (0.09, 0.23)***
Age	-0.02 (-0.09, 0.05) ns	-0.05 (-0.03, 0.12) ns	-0.03 (-0.11, 0.05) ns	-0.09 (-0.17, 0.01)*	-0.02 (-0.09, 0.06) ns
Alcohol use (relative to nonusers)	-0.49 (-0.55, -0.42)***	-0.28 (-0.36, -0.20)***	-0.26 (-0.34, -0.18)***	-0.18 (-0.26, -0.10)**	-0.46 (-0.53, -0.39)***
Maternal educational attainment	0.05 (-0.12, 0.09) ns	0.05 (-0.12, 0.09) ns	0.02 (-0.06, 0.10) ns	0.01 (-0.08, 0.08) ns	0.04 (-0.12, 0.04) ns
Knowledge of alcohol-disease link	0.09 (0.02, 0.16)*	0.12 (0.04, 0.19)**	0.07 (-0.01, 0.15) ns	0.06 (-0.02, 0.14) ns	0.11 (0.04, 0.18)**
	$R^2 = 0.31$ ($F_{(6, 609)} = 53.89$, $p < .01$)	$R^2 = 0.11$ ($F_{(6, 609)} = 15.35$, $p < .01$)	$R^2 = 0.10$ ($F_{(6, 609)} = 12.20$, $p < .01$)	$R^2 = 0.15$ ($F_{(6, 609)} = 18.08$, $p < .01$)	$R^2 = 0.26$ ($F_{(6, 609)} = 41.30$, $p < .01$)

*** $p < .001$; ** $p < .01$; * $p < .05$; β : standardised beta; CI: confidence interval; ns: not significant.

Discussion

The current study set out to assess alcohol use, awareness of the health risks associated with harmful alcohol use, support for alcohol policies, and predictors of support for alcohol-related policies among young adults. Of the 40% ($n = 245$), who indicated that they use alcohol, 38% ($n = 93$) of them reported harmful use (Figure 1). Support for alcohol policies was generally low, especially for *pricing and availability* and *marketing and information* domains of alcohol-related policies. There were, however, more support for policies on *drink-driving* and *harm reduction* domains of the alcohol-related policies (Figure 2). Generally, being female (relative to male), reporting lower levels of alcohol use, higher maternal educational attainment, and awareness of alcohol as a risk factor for the disease was consistently associated with support for alcohol-related policies. Being female (relative to male), abstinence or lower levels of alcohol use, and knowledge of alcohol-disease links uniquely and independently predicted support for alcohol-related policies (Table 3).

The results of this study agree with previous findings that indicated the female gender (relative to male gender), lower levels of alcohol use, knowledge of alcohol-disease links (Buykx et al., 2015; Grønbaek et al., 2001; Wakefield, Loken, & Hornik, 2010) as predictors of support for alcohol-related policies. Maternal education univariably predicted all support for alcohol-related policies (Jalilian et al., 2015) except drink-driving and harm reduction. Overall, knowledge of alcohol-disease links is critical for public backing of most alcohol-related policies.

Overall, more female (relative to male) students supported alcohol-related policies than their male counterparts. Similarly, those who do not use alcohol support alcohol-related policies more actively than users. Except for the policy domains of *harm reduction* and *drink-driving*, maternal education significantly predicted all the other domains of alcohol-related policy initiatives (Figure 2).

Elsewhere, maternal education has also been linked to low drug and substance use among adolescents in general (Jalilian et al., 2015). The relations of maternal educational levels with support for alcohol-related policies may be due to several factors. First, maternal education may be related to public health policy and positive attitudes towards public health policies that may stem from health care service use in general. On average, women utilise health care service more than men. Second, higher maternal education may equip mothers with crucial knowledge and skills about the dangers of harmful alcohol use and support for public health policies, which, they may have been able to communicate more clearly with their children. Last, maternal education may be associated with awareness of their children's drug and substance use problems, especially harmful alcohol use.

Generally, the students are supposed to be better educated and more knowledgeable about alcohol-disease links than out-of-school youth with low or minimal education. Besides lack of knowledge about alcohol-disease links among the students, there are specific drinking cultures unique to students such as 'room parties', 'leavers' parties', and 'Thank

God it's Friday (TGIF) parties', where students indulge in binge drinking. At one of the universities in Botswana, the student bar had to be closed due to excessive alcohol intake by students. Nevertheless, it is difficult to conclude whether excessive consumption among students and out of school youth due to lack of studies on alcohol use among different subpopulations. On the contrary, the students' knowledge of disease risks associated with harmful alcohol use is low, especially for diabetes, stroke, pancreatitis and heart diseases. The little knowledge on alcohol-disease links indicates that public education on the health risks associated with harmful alcohol use has not been prioritised, especially when the Alcohol Levy was introduced in Botswana. The high support for alcohol-related policies on *drink-driving* may be due to interventions such as random breath alcohol testing for drivers and continuous media campaigns by the Botswana Police Service to reduce drink-driving as a result of the high road traffic accidents.

Increasing awareness of alcohol-disease links through educational campaigns might be an essential intervention to increase support for alcohol-related policy initiatives. A previous study in New Zealand indicated continuous public support for alcohol-related policies when campaigns to raise awareness were sustained than in places where campaigns were not maintained (Casswell, Gilmore, Maguire, & Ransom, 1989). Similarly, previous studies also showed that public campaigns could improve awareness and support for policy initiatives (Buykx et al., 2015) which are critical in reducing disease and social burden of harmful alcohol use. Nonetheless, in designing public campaigns to improve awareness and support for alcohol-related policies, it is vital to include not only the negative impact of harmful alcohol use but to include positive outcomes alongside. These benefits may consist of good health associated with abstinence. Previous studies have demonstrated that when positive health outcomes and choices are presented alongside policy initiatives, such policies were supported (Pechey et al., 2014). Consequently, well-thought-out policy initiatives should be accompanied by vigorous public education to engender public support. Likewise, there should be a monitoring and evaluation mechanism put in place to evaluate levels of public support for alcohol-related policies and whether the policies are achieving their overall desired goals.

Some shortcomings need to be considered given these findings. First, the sample consisted of university students who may have different characteristics and are at a different developmental stage from the general population. Hence, it is difficult to extrapolate the results of this study to the general population of other young adults, such as out-of-school youths. The student population is of interest due to their unique alcohol consumption culture, which requires alcohol prevention strategy targeting their unique culture discussed earlier. Similarly, alcohol abuse among university students impedes upward social mobility and hinders human resource development for the country. Alcohol abuse is associated with poor grades and drop-out at universities, which impacts on the quality of the workforce and subsequent economic growth.

Second, the sample was drawn from university students currently enrolled at a public university in Botswana. The quota sampling strategy was used to realise a representative sample of young adults based on age, gender, and faculty where the students were enrolled, to limit the bias associated with sampling from one source. Generally, the results of the current study focussed mainly on awareness of alcohol as a risk factor for several diseases. It is possible that knowledge of alcohol-related risks for specific conditions such as liver cirrhosis may engender more support for alcohol policies than other relatively unknown diseases such as pancreatitis. Personal experiences might have also influenced the levels of support for policies. For example, Botswana reports high incidents of traffic accidents, domestic violence, and child sexual abuse (Philip & Amone-P'Olak, 2018). Participants with personal experiences of traffic accidents, domestic violence, and sexual abuse as a result of harmful alcohol use may support alcohol-related policies more than those without such experiences. Finally, support for alcohol-related policies was based on self-report that could be biased because it is difficult to know whether the support reported translate into real support.

Future research should focus on more longitudinal analyses based on continuous and periodic evaluation of support for alcohol policy initiatives among different subpopulations to determine factors that predict levels of support. Similarly, future studies should assess whether exposure to information translates into actual support for policy initiative or whether support is a result of a confluence of factors that include increased awareness of alcohol-disease links accompanied by positive information on staying free of alcohol.

Generally, knowledge of alcohol-disease links is low, even among more educated youth. Gender, maternal educational attainment, alcohol use and understanding of alcohol-disease links are predictors of support for alcohol-related policies. A consistent public campaign to increase awareness of alcohol-disease links might be an essential strategy to improve support for policy initiatives.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

- Australian Institute of Health and Welfare. (2011). *2010 National Drug Strategy Household Survey Report*.
- Babor, T.F., Higgins-Biddle, J.C., Saunders, J.B., & Monteiro, M.G. (2001). *AUDIT: The Alcohol Use Disorders Identification Test: Guidelines for use in primary health care* (2nd ed.). Geneva: World Health Organization.
- Buykx, P., Gilligan, C., Ward, B., Kippen, R., & Chapman, K. (2015). Public support for alcohol policies associated with knowledge of cancer risk. *International Journal of Drug Policy*, 26, 371–379. doi:10.1016/j.drugpo.2014.08.006
- Casswell, S., Gilmore, L., Maguire, V., & Ransom, R. (1989). Changes in public support for alcohol policies following a community-based campaign. *British Journal of Addiction*, 84(5), 515–522.

- Casswell, S., & Thamarangsi, T. (2009). Reducing harm from alcohol: Call to action. *The Lancet*, 373, 2247–2257. doi:10.1016/S0140-6736(09)60745-5
- Central Statistics Office (CSO). (1997). 1996, *Household Income and Expenditure Survey Report*.
- Esser, M.B., & Jernigan, D.H. (2018). Policy approaches for regulating alcohol marketing in a global context: A public health perspective. *Annual Review of Public Health*, 39, 385–401. doi:10.1146/annurev-publhealth-040617-014711
- Ferreira-Borges, C., Esser, M.B., Dias, S., Babor, T., & Parry, C.D. (2015). Alcohol control policies in 46 African countries: Opportunities for improvement. *Alcohol and Alcoholism*, 50, 470–476. doi:10.1093/alcalc/aggv036
- Field, A. (2017). *Discovering statistics using IBM SPSS statistics: North American edition*. Sussex, UK: Sage.
- Global AIDS Monitoring (UNAIDS/WHO/UNICEF), Spectrum estimates (UNAIDS/WHO) and WHO HIV Country Intelligence Tool. 2017. Retrieved from http://www.who.int/hiv/data/Country_profile_Botswana.pdf?ua=1
- Global Status Report on Alcohol and Health. (2018). Retrieved from http://apps.who.int/iris/bitstream/handle/10665/112736/9789240692763_eng.pdf
- Grønbaek, M., Strøger, U., Strunge, H., Møller, L., Graff, V., & Iversen, L. (2001). Impact of a 10-year nation-wide alcohol campaign on knowledge of sensible drinking limits in Denmark. *European Journal of Epidemiology*, 17, 423–427. doi:10.1023/a:1013765827585
- IBM Corp. 2017. *IBM SPSS Statistics for Windows, Version 25.0*. Armonk, NY: IBM Corp.
- Jalilian, F., Karami Matin, B., Ahmadpanah, M., Ataee, M., Ahmadi Jouybari, T., Eslami, A.A., & Mirzaei Alavijeh, M. (2015). Socio-demographic characteristics associated with cigarettes smoking, drug abuse and alcohol drinking among male medical university students in Iran. *Journal of Research in Health Sciences*, 15, 42–46.
- Li, J., Lovatt, M., Eadie, D., Dobbie, F., Meier, P., Holmes, J., ... MacKintosh, A.M. (2017). Public attitudes towards alcohol control policies in Scotland and England: Results from a mixed-methods study. *Social Science & Medicine*, 177, 177–189. doi:10.1016/j.socscimed.2017.01.037
- Mohapatra, S., Patra, J., Popova, S., Duhig, A., & Rehm, J. (2010). Social cost of heavy drinking and alcohol dependence in high-income countries. *International Journal of Public Health*, 55, 149–157. doi:10.1007/s00038-009-0108-9
- Moskalewicz, J., Wiecek, Ł., Karlsson, T., & Österberg, E. (2013). Social support for alcohol policy: Literature review. *Drugs: Education, Prevention and Policy*, 20, 361–374. doi:10.3109/09687637.2012.687794
- Pechey, R., Burge, P., Mentzakis, E., Suhrcke, M., & Marteau, T.M. (2014). Public acceptability of population-level interventions to reduce alcohol consumption: A discrete choice experiment. *Social Science & Medicine*, 113, 104–109. doi:10.1016/j.socscimed.2014.05.010
- Phillip, O., & Amone-P'Olak, K. (2018). The influence of self-reported childhood sexual abuse on psychological and behavioural risks in young adults at a university in Botswana. *South African Journal of Psychology*, 49(3), 353–363. doi:10.1177/0081246318801723
- Pitso, J., & Obot, I.S. (2011). Botswana alcohol policy and the presidential levy controversy. *Addiction*, 106, 898–905. doi:10.1111/j.1360-0443.2011.03365.x
- Rehm, J., Gmel, G.E., Gmel, G., Hasan, O.S.M., Imtiaz, S., Popova, S., ... Shuper, P.A. (2017). The relationship between different dimensions of alcohol use and the burden of disease – An update. *Addiction*, 112, 968–1001. doi:10.1111/add.13757
- Ronksley, P.E., Brien, S.E., Turner, B.J., Mukamal, K.J., & Ghali, W.A. (2011). Association of alcohol consumption with selected cardiovascular disease outcomes: A systematic review and meta-analysis. *BMJ*, 342, d671. doi:10.1136/bmj.d671
- Saunders, J.B., Aasland, O.G., Babor, T.F., De la Fuente, J.R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*, 88, 791–804. doi:10.1111/j.1360-0443.1993.tb02093.x
- The Republic of Botswana. (2008). Control of Goods (Intoxicating Liquor Levy) (Amendment) Regulations, 2008 - S.I. No. 111 of 2008. Government Gazette Extraordinary, XLVI (84), Gaborone.
- Tsai, A.C., Leiter, K., Heisler, M., Iacopino, V., Wolfe, W., Shannon, K., ... Weiser, S.D. (2011). Prevalence and correlates of forced sex perpetration and victimisation in Botswana and Swaziland. *American Journal of Public Health*, 101, 1068–1074. doi:10.2105/AJPH.2010.300060
- Wakefield, M.A., Loken, B., & Hornik, R.C. (2010). Use of mass media campaigns to change health behaviour. *Lancet*, 376, 1261–1271. doi:10.1016/S0140-6736(10)60809-4
- World Economic Outlook Database. (2018, April). Retrieved from <http://www.imf.org/external/pubs/ft/weo/2018/01/weodata/index.aspx>
- World Health Organization. (2014). Global Status Report on Alcohol and Health, 2014. Geneva: Management of Substance Abuse Unit, World Health Organization. Retrieved from http://www.who.int/substance_abuse/publications/global_alcohol_report/en/
- Young, B., Lewis, S., Katikireddi, S.V., Bauld, L., Stead, M., Angus, K., ... Langley, T. (2018). Effectiveness of mass media campaigns to reduce alcohol consumption and harm: A systematic review. *Alcohol and Alcoholism*, 53, 302–316. doi:10.1093/alcalc/aggx094
- Zhao, J., Stockwell, T., Roemer, A., & Chikritzhs, T. (2016). Is alcohol consumption a risk factor for prostate cancer? A systematic review and meta-analysis. *BMC Cancer*, 16, 845. doi:10.1186/s12885-016-2891-z