

## A SURVEY OF DUNEDIN TERTIARY STUDENTS' DRINKING BEHAVIOURS: A PILOT STUDY FOR A PROPOSED INTERACTIVE BOTTLE BIN

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### INTRODUCTION

Alcohol is one of the most commonly used and socially acceptable recreational drugs in the world, available in bars, clubs, off-licences and supermarkets, with the largest hazardous drinking age group identified as 18 to 24-year-olds (Stefanogiannis, Mason & Yeh, 2007). One US study showed that 42% of university students had engaged in one or more heavy drinking episodes in the previous month (Hingson, Heeren, Zakocs, Kopstein & Wechsler, 2002). The drinking culture among university students is not just an issue in America; it is also a problem in Sweden, South Africa and Australia (Lindsay, 2005). Young people in Australia have been found to drink excessively; the government is concerned that through aggressive marketing and licencing deregulation this lifestyle is becoming culturally normalised (Lindsay, 2005). Results from surveys in New Zealand have shown that university students, compared to their non-student peers, also consume large amounts of alcohol [correct?] (McLean & Connor, 2009). This behaviour leads to students being more likely to drink hazariously, be involved in acts of violence, offending behaviour and risky sexual behaviours, and have academic problems.

Over recent years, disorderly events in Dunedin have focused attention on alcohol-related harm within the city and particularly on the student population. The population of Dunedin in 2017 is 123,000, with the student population comprising approximately 20% of this total, at 25,000 (<http://www.stats.govt.nz>). A Dunedin-based study (McLean & Connor, 2009) has investigated students with alcohol-related harm receiving treatment at a local hospital's emergency room. Their findings indicated that student flats and houses were the most prevalent location for last drinks to be consumed prior to their injury occurring. Alcohol stores and supermarkets are easily accessible on foot for Dunedin students, leading to increased pressure for alcohol to be purchased and consumed (Kypri, Bell, Hay & Baxter, 2008). Dunedin's notorious student drinking culture has led to Otago University gaining a reputation for anti-social student behaviour, often resulting in streets being littered with broken glass and debris ([www.dunedin.govt.nz](http://www.dunedin.govt.nz)).

The researchers proposed investigating the relationship between students and alcohol consumption in Dunedin. It was proposed that data would be collected using a purpose-built interactive bottle bin inspired by the VW fun theory bottle bank ([www.thefuntheory.com](http://www.thefuntheory.com)). The completed bottle bin (see Figure 1) would capture photographic data about the bottles deposited, enabling the researchers to calculate the units of alcohol consumed over a particular period. Students hosting social events would be offered free use of the bottle bin on the condition that they indicated the number of people who attended the event when the bin was collected. This would provide valuable data about the drinking habits of students studying in Dunedin.



Figure 1. The completed interactive bottle bin

Prior to the deployment of the bottle bin, a pilot study was conducted to obtain data by more traditional means in order to provide a basis for comparison and support the rationale for the utilisation of the bottle bin.

## LITERATURE REVIEW

Numerous studies (Caudwell & Hagger, 2014; Hallett et al., 2012; Kypri, 2002; Kypri, Cronin & Wright, 2005; Kypri, Bell, Hay & Baxter, 2008; McLean & Connor, 2009; Zamboanga et al., 2010) have administered surveys to tertiary students studying at universities, polytechnics and colleges. However, there are concerns with many of these surveys regarding the potential for recall bias, especially when dealing with alcohol consumption and its consequences, such as blacking out and memory loss. Consequently, recall bias can limit such studies, particularly in terms of the volume of alcohol consumed – a factor that the deployment of the bottle bin aimed to address.

Perkins (2002) looked at the culture of American college students and the negative patterns established by their drinking habits and misuse of alcohol. This study analysed survey data trends and patterns of alcohol consumption over a 20-year period. It concluded that males suffered a higher rate of harm in public spaces (such as streets and parks), with more serious adverse consequences than females. Perkins highlighted the prevalence of adverse drinking behaviour in US sororities and fraternities, comparable to halls of residence and student flats in Dunedin. He found a modest correlation between a student's self-perception of being a problem drinker and their actually suffering negative consequences due to alcohol consumption.

Kypri (2002) aimed to determine the prevalence of hazardous drinking and the negative consequences of alcohol consumption among New Zealand tertiary students, as well as establish predictors of hazardous drinking across a six-month period. This study discussed the impact of social influence and peer pressure on an individual when making decisions about alcohol consumption and alcohol-influenced behaviours. The author sought to determine the prevalence of these behaviours in New Zealand tertiary education settings and the negative consequences on individuals and their community. The study was conducted in Dunedin, New Zealand, recruiting students living in halls of residence who had completed the Alcohol Use Disorders Identification Test (AUDIT), and recording their

drinking habits and alcohol consumption. The survey was repeated throughout a single year and data was compared between the different collection stages. The findings showed that 60% of male and 58.2% of female respondents drank more than the "sensible upper limits." This study provided a baseline of the drinking habits of students in Dunedin.

Kypri, Cronin and Wright (2005) used the same AUDIT survey utilised in the present study and administered it to two groups for direct comparison. One group was Otago University students studying in 2002 and the other comprised non-student youths. The findings showed that the student group exceeded their non-student counterparts in the AUDIT survey in relation to both excessive drinking and alcohol-related harm.

In a New Zealand-wide study, Kypri, Bell, Hay and Baxter (2008) demonstrated an increased incidence of alcohol outlets in student areas, potentially contributing to increased levels of alcohol-related harm among university students. Their findings suggested a positive link between alcohol outlet density and individual drinking behaviours, along with the problems associated with drinking. This study used international cross-sectional data to investigate the associations between the geographic density of alcohol outlets and the incidence of alcohol-related harm. The researchers noted several case studies including an increase in alcohol-related violence investigated by Norwegian police concurrent with an increase in alcohol outlets; and the prevalence of gonorrhoea in high-density outlet areas in California. They concluded that the promotion of alcohol in student-dense areas, due to the business competition between outlets in close proximity to each other, was leading to higher consumption of alcohol, hazardous drinking and alcohol-related harm.

Zamboanga et al. (2010) used the AUDIT self-report questionnaire to collect data from students at 30 universities across the United States. Data was collected about students' drinking attitudes, behaviours and their participation in drinking games. The respondents (n=2230) were categorised into four groups: low frequency/low consumption (n=1047); low frequency/high consumption (n=453); high frequency/low consumption (n=326); and high frequency/high consumption (n=404). Drinking games were defined as a social contest consisting of a set of rules or guidelines that facilitated heavy alcohol use. Involvement in drinking games could lead to a reversal of competence – that is, as players became more intoxicated, their skills diminished and they became more likely to cause harm to themselves and others. The results showed that the frequency and duration of consumption created negative outcomes including higher injury rates, adverse social consequences and the development of dependence on alcohol.

Hallett et al. (2012) used an online survey to investigate university student drinking behaviour. Invitations were sent randomly to 13,000 undergraduate students attending university in Australia. Responses were received from 7237 students, all of who were considered eligible to participate in the study. Ninety percent of the students who participated in this study confirmed they had drunk alcohol in the previous 12 months, 34% meeting the criteria for hazardous drinking. There has been considerable interest in hazardous drinking by tertiary students in the media. Another Australian study (Hallett et al., 2013) reported that 70-96% of university students regularly consumed alcohol, with 50% drinking to intoxication at least once per week. Half the male and a third of the female respondents reported hazardous levels of drinking, suggesting a need for interventions to reduce hazardous drinking at university.

Pengpid, Peltzer, Van der Heever and Skaal (2013) conducted a randomised controlled trial among university students in South Africa. This trial tested the effectiveness of the Screening and Brief Intervention for students with alcohol problems. Students registered their interest by attending public recruitment venues around their respective campuses. Students were screened for alcohol problems and those eligible (n=152) were randomised into either the intervention arm or control group. The intervention group received one brief counselling session on alcohol risk reduction, while the control received a health education leaflet. One hundred and forty-seven students attended the twelve-month follow up. Data gathered from the follow up indicated that depression scores decreased over the duration of the intervention and that the brief intervention made a realistic change when utilised with university students. The findings suggested potential benefits from running screening and brief interventions to reduce alcohol-

related harm among tertiary students.

An online survey was utilised by Caudwell and Hagger (2014) to investigate pre-drinking behaviour. Undergraduate students at an Australian university (n=144) completed an online survey that assessed pre-drinking motives, pre-drinking cost motives and “alcohol identity.” The findings suggested that a dual-system approach, like that utilised by Pengpid, Peltzer, Van der Heever and Skaal (2013), had the ability to predict alcohol consumption and harm and showed that there was a need for interventions to reduce alcohol harm and excessive consumption. The research showed that pre-drinkers in the Australia were four times more likely to consume as much as five times the recommended safe drinking limit over an evening, and more than twice as likely to become involved in a confrontation in the night-time environment than non-pre drinkers (Caudwell & Hagger, 2014).

Hernandez, Leontini and Harley (2013) conducted interviews with six randomly selected participants between the ages of 18 and 21 at an Australian university. The interviews lasted an hour, each being conducted in private. The six students reflected on the “harm” associated with drinking; all shared the same belief that when drinking in their friendship groups they felt they would not be at risk. All indicated that they drank between two and 20 alcoholic beverages in a single session, and during the interview discussed sensitive topics such as drinking-associated violence, drink-driving, underage drinking, their family history of drinking and drug use. This study showed that there was a need for a campaign that would raise students’ awareness of alcohol-related harm minimisation.

Mclean and Connor (2009) conducted a cross-sectional study in Dunedin, New Zealand, where patients (16 years and older) presented with an injury at one of three primary care facilities in the city. A consultation was conducted and an anonymous survey completed by participants. This included questions about sociodemographic factors, type of injury and whether participants had consumed alcohol within the last six hours, with a specific location named. A total of 317 participants completed the survey; 17% reported that they had consumed alcohol in the six hours prior to injury. The mean drinking age was 21 and women outnumbered men. Student flats and houses were identified as the most common location for respondents’ last drink prior to injury. If participants were too intoxicated to provide consent, they were excluded.

## METHODS

The purpose of the present study was to collect pilot data regarding students’ drinking behaviours at a New Zealand tertiary education institution.

While it was acknowledged that concerns exist regarding the potential for recall bias with alcohol-related surveys, reliable baseline, comparative data was required. Therefore, a brief questionnaire was adopted using standardised questions from the Alcohol Use Disorders Identification Test (AUDIT) template. The AUDIT is recommended for use in primary care (WHO, 2017) and has been used widely in previous research (Kypri, 2002; Kypri, Cronin & Wright, 2005; Zamboanga et al., 2010). The questionnaire consisted of ten questions relating to alcohol consumption and hazardous alcohol-based behaviours. Questions 1 to 3 related to alcohol consumption, 4 to 6 to alcohol-related harm, and 7 to 10 to alcohol-reduced harm. Each question had five alternative answer responses except for the last two questions, which had three options.

The questionnaire was distributed using the Web-based platform Survey Monkey, and was accessible to university and polytechnic students based in Dunedin. Inclusion criteria required participants to be resident in Dunedin. All participants were volunteers recruited via open source methods such as researcher-created public Facebook pages linked to existing student pages. Potential participants were invited to private-message the researchers, who then contacted them to participate via private email. Students who responded and expressed interest in participating were emailed a Web-link to the survey, which included an information page, consent form and the survey itself. An exit button was provided and participants could leave at any point prior to submitting their responses. Potential

respondents were given 22 days to complete the survey. Security and other restrictions were put in place to ensure that each student could only complete the survey once and to maintain the anonymity of participants. No names or emails were collected for use in publications.

## Ethics

Prior to applying for ethics approval, researchers undertook Māori consultation with Otago Polytechnic's Kaitohutohu Office. Once this was completed, ethics approval was applied for and granted by the Polytechnic's Research Ethics Committee. All guidelines and limitations were complied with during the completion of this research.

## Data Analysis

The data collected was analysed and summarised for each question. Each participant's survey response was scored with a maximum of four points for each question and their scores were summed to create a total AUDIT score. If a participant scored seven or below, there was deemed to be no cause for concern around their drinking behaviour. Those scoring between eight and 15 were thought to require focussing on reducing their drinking. Scoring 16-19 indicated a need to monitor participants' drinking or receive limited counselling. For those scoring 20 or above, further diagnostic evaluation was warranted. Averages were calculated for all the participants' responses to the AUDIT questionnaire. The results were compared to previous AUDIT studies.

## RESULTS

A total of 145 participants attempted the questionnaire and 141 (97.24%) completed it fully. Incomplete questionnaire responses were removed from the data set for analysis.

Participants' responses to the first question, "How often do you have a drink containing alcohol?", are summarised in Table 1.

	<b>Never</b>	<b>Monthly or less</b>	<b>2 – 4 times per month</b>	<b>2 – 3 times per week</b>	<b>4 or more times per week</b>
Question 1 – How often do you have a drink containing alcohol	2% (n = 3)	15% (n = 21)	51% (n = 72)	25% (n = 35)	7% (n = 10)

Table 1. Participants responses to questionnaire (question 1)

The number of drinks respondents consumed on a typical day when drinking are set out in Table 2.

	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
Question 2 - How many drinks containing alcohol do you have on a typical day when you are drinking?	8.5% (n = 12)	11.5% (n = 16)	18.5% (n = 26)	27% (n = 38)	34.5% (n = 49)

Table 2. Participants responses to questionnaire (question 2 )

Participants' responses to questions 3-8 in the AUDIT questionnaire are summarised in Table 3.

	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
Question 3 - How often do you have 6 or more drinks on one occasion?	7% (n = 10)	21% (n = 30)	25% (n = 35)	44% (n = 62)	3% (n = 4)
Question 4 - How often during the last year have you found you were not able to stop drinking once you started?	58% (n = 82)	15% (n = 21)	13% (n = 18)	12% (n = 17)	2% (n = 3)
Question 5 - How often during the last year have you failed to do what was normally expected of you because of drinking?	48% (n = 68)	35% (n = 49)	12% (n = 17)	4% (n = 6)	1% (n = 1)
Question 6 - How often during the last year have you needed a drink in the morning to get yourself going after a heavy drinking session?	87.5% (n = 123)	7.5% (n = 11)	1.5% (n = 2)	2% (n = 3)	1.5% (n = 2)
Question 7 - How often during the last year have you had a feeling of guilt or remorse after drinking?	31% (n = 44)	42% (n = 59)	17% (n = 24)	8.5% (n = 12)	1.5% (n = 2)
Question 8 - How often during the last year have you been unable to remember what happened the night before because of your drinking?	22.5% (n = 32)	41% (n = 58)	27.5% (n = 39)	7.5% (n = 10)	1.5% (n = 2)

Table 3. Participants response to questionnaire (questions 3 to 8)

For the two final questions in the AUDIT questionnaire, participants were able to choose one of three responses. Participants were asked whether they "or someone else had ever been injured due to their [own] drinking" and whether "anyone had ever shown concerns or suggested they cut down their drinking." Participants' responses are summarised in Table 4.

	No	Yes, but not in the last year	Yes, during the last year
Question 9 - Have you or someone else been injured because of your drinking?	47.5% (n = 67)	21.5% (n = 30)	31% (n = 44)
Question 10 - Has a relative, friend, doctor or other health care worker been concerned about your drinking or suggested you cut down?	78.5% (n = 111)	4% (n = 6)	17.5% (n = 24)

Table 4. Participant response to questionnaire (questions 9 & 10)

The highest proportion of respondents scored between 8 and 15. As Table 5 shows, 40.43% (n=57) of participants scored between 8 and 15. The second highest group scored 7 or below, with 21.99% (n=31) of respondents fitting this category. 19.86% (n=28) of respondents scored an average of 20 points or above. The last group represented those who scored between 16 and 19 points – 17.73% (n=25).

AUDIT Score	Participants	Percentage
7 or below	31	21.99%
8 to 15	57	40.43%
16 to 19	25	17.73%
20 plus	28	19.86%

Table 5. Participants AUDIT scores and percentage of sample

A total of 141 participants completed the survey in full and were scored according to their response to the AUDIT questionnaire: 0-7 = moderate levels of drinking; 8-15 = hazardous levels of drinking; 16-19 harmful levels of drinking; and 20 and above meant a dependence on alcohol. The largest group of participants (40%) scored between 8 and 15, indicating that they were hazardous drinkers. A major cause for concern were the 20% of participants who scored 20 or above, representing a high risk of alcohol dependence.

## DISCUSSION

This study has demonstrated that the AUDIT survey can be a useful tool in identifying hazardous drinking and the drinking trends of tertiary students in Dunedin. All the participants who completed the questionnaire were current drinkers or had consumed alcohol within the last year. The results showed a high prevalence of hazardous drinking, with over 40% of participants scoring between eight and 15 points on the AUDIT survey. This result can be compared to the Australian-based undergraduate study by Hallett et al. (2012), which recorded a high prevalence

of hazardous drinking, with 48% of participants scoring between eight and 15 points.

The second question in the AUDIT questionnaire used in our study, relating to hazardous drinking levels, indicated that binge drinking in the Dunedin context was five standard drinks for men and four standard drinks for women (Kypri, Cronin & Wright, 2005). A total of 79.72% of participants in our study indicated that they had on occasion consumed more than five drinks in one night. Similar observations were made by Kypri, Cronin and Wright (2005), who found that college students in the US had heavier drinking periods consisting of five or more drinks for men and four or more drinks for women on a monthly basis, compared to their non-college counterparts.

Over half the number of participants (52.41%) in our study indicated that they had injured themselves or someone else while intoxicated at some time, and 31.03% had been injured during the previous year. This was consistent with another New Zealand study (McLean & Connor, 2009), which observed that 17% of participants who reported to Dunedin emergency services with injuries were intoxicated. They also noted that this group were younger than non-drinkers, having an average age of 21. The study revealed that 64% of the drinkers had exceeded the guidelines about the safe number of drinks to be consumed in one drinking occasion.

As with other similar studies, the present study may have been biased by recall validity, which as we have seen can compromise studies dealing with alcohol (hence the need to develop an objective, unbiased means of collecting data such as the bottle bin). It should also be noted that the age and gender of participants were not recorded, so the study was unable to consider the impact of these factors (e.g., gender-specific safe drinking recommendations).

## CONCLUSION

The results of this study provide up-to-date data and a baseline for future studies to use for comparison when investigating alcohol consumption and its attendant behaviours in the lives of tertiary students in Dunedin. Our results add to the growing body of evidence that emphasises not only the need for effective alcohol interventions, but also effective ways of evaluating alcohol consumption and its effects on behaviour in a naturalistic social environment. In this study, it is cause for concern that within the tertiary setting only 21.99% of the participants achieved a score of 7 or less in the AUDIT questionnaire. Previous research (Pengpid, Peltzer, Van der Heever & Skaal, 2013) has suggested that the first stage in reducing alcohol-related harm among tertiary students is identifying the problem. The AUDIT survey used in this study indicated that a problem exists, and it is hoped that the bottle bin protocol will provide additional, more detailed data on the extent of the problem.

**Richard Humphrey** began his academic career at the University of Southampton (UK), where he taught sport studies and sport management and development. Following some postgraduate study at the University of Bristol, he emigrated to New Zealand in 2013 and took up a lecturing position at the Institute of Sport and Adventure at Otago Polytechnic. Richard teaches and supervises undergraduate research in the fields of exercise, health and research methods. His research interests include the therapeutic use of exercise and substance misuse, particularly in the case of people with coexisting mental health issues.

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