Johnson, Natalie A.; Kypri, Kypros; McCambridge, Jim; Latter, Joanna; McElduff, Patrick; Saunders, John B.; Saitz, Richard; Attia, John; Dunlop, Adrian; Doran, Christopher; Wolfenden, Luke "Prevalence of unhealthy alcohol use in hospital outpatients". Originally published in Drug and Alcohol Dependence Vol. 144, p. 270-273 (2014)

Available from: http://dx.doi.org/10.1016/j.drugalcdep.2014.08.014

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Accessed from: http://hdl.handle.net/1959.13/1059187
Prevalence of unhealthy alcohol use in hospital outpatients

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Word count = 2093
Abstract (250 words)

**Background:** Few studies have examined the prevalence of unhealthy alcohol use in the hospital outpatient setting. Our aim was to estimate the prevalence of unhealthy alcohol use among patients attending a broad range of outpatient clinics at a large public hospital in Australia.

**Methods:** Adult hospital outpatients were invited to complete the Alcohol Use Disorders Identification Test Consumption questions (AUDIT-C) using an iPad as part of a randomised trial testing the efficacy of alcohol electronic screening and brief intervention. Unhealthy alcohol use was defined as an AUDIT-C score $\geq 5$ among men and $\geq 4$ among women.

**Results:** Sixty percent (3616/6070) of invited hospital outpatients consented, of whom 89% (3206/3616) provided information on their alcohol consumption (either reported they had not consumed any alcohol in the last 12 months or completed the AUDIT-C). The prevalence of unhealthy alcohol use was 34.7% (95% confidence interval [CI]: 33.0-36.3%). The prevalence among men aged 18-24 years, 25-39 years, 40-59 years and 60 years and older, was 74.4% (95% CI: 68.4-80.4%), 54.3% (95% CI: 48.7-59.8%), 44.1% (95% CI: 39.9-48.3%), and 27.0% (95% CI: 23.6-30.4%), respectively (43.1% overall; 95% CI: 40.8-45.5%). The prevalence among women aged 18-24 years, 25-39 years, 40-59 years, and 60 years and older, was 48.6% (95% CI: 39.2-58.1%), 36.9% (95% CI: 31.2-42.6%), 25.2% (95% CI: 21.5-29.0%) and 14.5% (95% CI: 11.7-17.3%), respectively (24.9% overall; 95% CI: 22.7-27.1%).

**Conclusion:** A large number of hospital outpatients who are not currently seeking treatment for their drinking could benefit from effective intervention in this setting.

**Keywords:** unhealthy alcohol use, hospital outpatients, prevalence
1. Introduction

Reducing unhealthy alcohol use, which covers the spectrum of use from that which risks health consequences through to dependence (Saitz, 2005), is a global health priority (World Health Organisation, 2010). Although alcohol screening and brief intervention (SBI) has been shown to reduce alcohol consumption in primary healthcare patients (Kaner et al., 2007), it is not implemented routinely in any country (Makela et al., 2011; Nilsen et al., 2011). In Australia, for example, general practitioners provided almost 129 million occasions of service in 2012-13 (Australian Government Department of Health, 2012) but provided counselling and advice about alcohol at a rate of only 0.2 episodes per 100 general practice encounters even though the prevalence of unhealthy alcohol use was 24% (Britt, Miller, Henderson, Charles, et al., 2013). Barriers include time constraints, insufficient training, and the risk of damaging rapport with patients (Johnson et al., 2011).

Electronic screening and brief intervention (e-SBI), which uses computers, tablets, and mobile phones to deliver SBI, circumvents many provider-level barriers. Although e-SBI has been shown to be efficacious in certain primary healthcare settings (Bendtsen et al., 2011; Kypri et al., 2008; Kypri et al., 2004), it would be unwieldy to set-up and maintain the infrastructure required to deliver it routinely in every general practice. Clinics in large public hospitals, which provide services to patients who have generally been referred from a primary care provider for additional specialty care in the hospital outpatient setting, could provide an additional or alternative point of contact for the routine delivery of e-SBI. In Australia, for example, specialist outpatient clinics in large public hospitals delivered 14.9 million individual outpatient care services in 2012-13 (Australian Institute of Health and Welfare, 2014). Since a large number of patients are attending appointments in a smaller number of locations, this should reduce the cost and complexity associated with setting up and maintaining the infrastructure required to deliver e-SBI routinely.
Few studies have examined the prevalence of unhealthy alcohol use in the hospital outpatient setting. The prevalence of unhealthy alcohol use is very high in studies conducted in oral and maxillofacial clinics, with 78% (Smith et al., 2003) and 95% (Goodall et al., 2008) of patients screening positive for unhealthy alcohol use, and lower in studies conducted in general outpatient clinics (Chang et al., 2011; Emmen et al., 2005; Pengpid et al., 2011; Persson & Magnusson, 1987). Estimates range from 6% in a Dutch hospital (Emmen et al., 2005) to 38% in a South African hospital (Pengpid et al., 2011). Our study adds to this sparse literature by providing an estimate of the prevalence of unhealthy alcohol use among patients attending a broad range of outpatient clinics at a large public hospital in Australia.

2. Methods

2.1 Design

This is a secondary analysis of baseline data collected for a randomised trial (ACTRN12612000905864) testing the efficacy of e-SBI in hospital outpatients with hazardous or harmful drinking (Johnson, Kypri, Saunders, et al., 2013). As described elsewhere, our target sample size was 772 (Johnson, Kypri, Saunders, et al., 2013). Approval was obtained from the Hunter New England Human Research Ethics Committee (12/05/16/4.04) and the University of Newcastle Human Research Ethics Committee (H-2012-0272).

2.2 Setting

The study was conducted in one of the two large waiting areas in the Ambulatory Care Centre of a large public hospital whose service area includes a major metropolitan centre, several large regional centres and many smaller rural and remote communities. Patients attending appointments at the following clinics were approached: cardio-thoracic surgery, colorectal surgery, general surgery, neurosurgery, ophthalmology, oral and maxillofacial surgery, orthopaedics and
rehabilitation, otolaryngology, pain management, pre-operative assessment, renal surgery and transplant, vascular disease prevention, vascular surgery, and urology. These patients, following a referral from a primary healthcare provider, may have travelled up to 500 kilometres to attend their appointment because the widest range of services is provided by large public hospitals.

2.3 Procedure

Hospital outpatients were approached while they were waiting for their appointment and consenting outpatients completed the baseline questionnaire via an iPad without moving from their seat. We adopted this procedure, despite concerns about privacy, because our pilot study showed that outpatients felt uncomfortable about leaving their seat in the large waiting area in case they missed their appointment (Johnson, Kypri, & Attia, 2013). Page 1 of the program described the study, page 2 asked basic demographic questions (gender and age group), page 3 asked respondents if they had consumed alcohol in the last 12 months (yes / no), page 4 asked respondents if they were currently receiving treatment for alcohol-related problems (yes / no), and page 5 comprised the AUDIT-C (Bradley et al., 2007).

2.4 Eligibility

Adult hospital outpatients were invited to participate in the trial of e-SBI if they could provide written informed consent, self-administer the questionnaire using an iPad, and were not moving to an as yet unknown address in the next 12 months (i.e., would be lost to follow-up). Consenting hospital outpatients who reported via the iPad that they had not consumed any alcohol in the last 12 months or were receiving care for their drinking were excluded from the trial prior to randomisation (i.e., did not complete the AUDIT-C). While the former were included in the present study as non-drinkers (allocated an AUDIT-C score of 0), the latter could not be included as we had no information on their alcohol consumption.
2.5 Unhealthy alcohol use

Unhealthy alcohol use was classified as an AUDIT-C (Crawford et al., 2013) score ≥5 for men and ≥ 4 for women, which is consistent with other Australian research (Britt, Miller, Henderson, Bayram, et al., 2013).

2.6 Analysis

Descriptive statistics were used to estimate the proportion of hospital outpatients with unhealthy alcohol use overall, and by gender and age group. Multiple logistic regression was used to determine whether age and gender were independently associated with unhealthy alcohol use (no other variables were entered into the model). A sensitivity analysis was conducted to place bounds around our prevalence estimate that reflect the effects of extreme selection bias (White et al., 2011). First we assumed that adult hospital outpatients who agreed to participate but did not complete the AUDIT-C because they were called for their appointment (non-completers) did not differ from those who completed the AUDIT-C: a missing at random (MAR) assumption. Accordingly, these adult hospital outpatients were allocated the mean value for participating hospital outpatients of the same gender and age. Second, we assumed that adult hospital outpatients who did not complete the AUDIT-C because they declined to participate, could not provide informed consent, could not self-administer the questionnaire using an iPad, were moving to an as yet unknown address, or were receiving treatment for their drinking differed markedly from those who completed the AUDIT-C: a missing not at random (MNAR) assumption. We ran two MNAR scenarios giving these adult hospital outpatients an AUDIT-C score (a) 50% higher and (b) 50% lower than the mean scores obtained by participating hospital outpatients of the same age and gender, on the assumption that the age and gender distributions were the same among participants and non-participants. While this is unlikely to be the case, we assumed equivalence because we lacked an empirical basis for estimating the distributions.
3. Results

3.1 Participants

The median number of hospital outpatients attending clinic appointments was 258 per day (minimum: 119, maximum: 359). The median number of people approached per day was 108 (minimum: 37, maximum: 189). Of the 7107 people we approached, 1037 were not eligible because they were not adults (<18 years) or were friends or relatives of a hospital outpatient. Among the 6070 adult hospital outpatients we approached, 338 did not meet the trial inclusion criteria. Although the number of adult hospital outpatients who were not eligible was carefully documented during the 81 day recruitment period, the reason for ineligibility was only documented on the last 34 days due to a miscommunication between the Project Manager and the research assistants. In the data from the 34 days with full documentation, 4.4% of hospital outpatients were unable to self-administer the questionnaire using the iPad, 0.6% were unable to provide written informed consent; and 0.6% were moving to an unknown address in the next 12 months.

Sixty percent (3616/6070) of the invited hospital outpatients consented, of whom 89% (3206/3616) provided information on their alcohol consumption (either reported they had not consumed any alcohol in the last 12 months or completed the AUDIT-C). The mean age of these participants was 52 years (SD 19 years) and 54% (1716/3206) were men.

3.2 Prevalence of unhealthy alcohol consumption and association with gender and age group

The prevalence of unhealthy alcohol use among participants was 34.7% (95% confidence interval [CI]: 33.0-36.3%). The prevalence among men aged 18-24 years, 25-39 years, 40-59 years and 60 years and older, was 74.4% (95% CI: 68.4-80.4%), 54.3% (95% CI: 48.7-59.8%), 44.1% (95% CI: 39.9-48.3%), and 27.0% (95% CI: 23.6-30.4%), respectively (43.1% overall; 95% CI: 40.8-45.5%). The prevalence among women aged 18-24 years, 25-39 years, 40-59 years, and 60 years and older, was 48.6% (95% CI: 39.2-58.1%), 36.9% (95% CI: 31.2-42.6%), 25.2% (95% CI: 21.5-29.0%) and...
14.5% (95% CI: 11.7-17.3%), respectively (24.9% overall; 95% CI: 22.7-27.1%). Gender and age group were associated with unhealthy alcohol use in univariate and multivariate analyses as shown in Table 1. The proportions with each AUDIT-C score stratified by gender and age group are shown in Table 2 to enable calculation of the prevalence of unhealthy drinking using other cut-points.

3.3. Sensitivity analysis

Under the extreme assumptions of our sensitivity analysis, the overall prevalence of unhealthy alcohol use in hospital outpatients could be as low as 21% or as high as 54%.

4. Discussion

Our secondary analysis of baseline data collected for a trial testing the efficacy of e-SBI in hospital outpatients with hazardous or harmful drinking (Johnson, Kypri, Saunders, et al., 2013) showed that approximately one in three adult hospital outpatients had unhealthy alcohol use. This is higher than the Australian primary healthcare estimate of one in four adults (Britt, Miller, Henderson, Charles, et al., 2013) and the Australian general population based estimate of one in five adults (Australian Institute of Health and Welfare, 2011). In light of the well documented causal association between alcohol consumption and injury (World Health Organization, 2007), it is plausible that the prevalence of unhealthy alcohol use is higher in the outpatient setting than in the primary care setting because clinics that provide care to patients with injuries contribute patients to this population (for example, oral and maxillofacial surgery, orthopaedics and rehabilitation services following an emergency department attendance or hospital admission). Further research is required to test this hypothesis as we thought it too intrusive to ask patients the reason for their outpatient clinic appointment and therefore lack a breakdown by clinic.
Our findings, which are consistent with those reported in South Africa (Pengpid et al., 2011), suggest that a large number of hospital outpatients who are not seeking treatment for their drinking could benefit from effective intervention in this setting. This may be particularly true for men aged 18-24 years because the proportion reporting unhealthy alcohol use was considerably higher in this study than in studies conducted in the primary healthcare setting, where 50% reported unhealthy alcohol use (Britt, Miller, Henderson, Bayram, et al., 2013).

Strengths of the study include the use of a valid screening instrument (Bradley et al., 2007), a pre-tested study procedure (Johnson, Kypri, & Attia, 2013), and the large sample size. Although self-reported alcohol consumption via computers has been shown to be reliable (Bonevski et al., 2010; Lotfipour et al., 2012), the main limitation of this study is the reliance on self-report, especially since many participants completed the AUDIT-C in close proximity to other people. Another limitation was the non-collection of alcohol consumption data from 40% of the adult hospital outpatients we invited. Because we suspected these outpatients were non-drinkers who felt they could contribute little to our study or heavy drinkers who did not want to report their drinking, we conducted a sensitivity analysis, to place bounds around our prevalence estimate reflecting the effects of extreme selection bias (White et al., 2011), which suggested that the prevalence of unhealthy alcohol use may be as low as one in five hospital outpatients or as high as one in two.

To our knowledge, this is the first study to estimate the prevalence of unhealthy alcohol use in hospital outpatients in Australia and one of only a few such studies globally. Our findings suggest that a large number of patients who are not seeking treatment for their drinking could benefit from effective intervention in this setting.
References


Table 1: Prevalence of unhealthy alcohol use by gender and age group and the association between these demographic characteristics (N=3206)

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Table 2: AUDIT-C score (%) by gender and age group (N = 3206)

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