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Effect of electronic screening and brief intervention on hazardous or harmful drinking among adults in the hospital outpatient setting: A randomized, double-blind, controlled trial

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ABSTRACT

Background: Most trials of electronic alcohol screening and brief intervention (e-SBI) have been conducted in young people. The aim of this study was to evaluate the effect of e-SBI in adults with hazardous or harmful drinking.

Methods: This individually randomized, parallel, two-group, double-blind controlled trial was conducted in the outpatient department of a large public hospital in Australia. Consenting adults who scored 5–9 on the AUDIT-C (837/3225; 26%) were randomized in a 1:1 ratio by computer to screening alone (442/837; 53%) or to 10 min of assessment and personalized feedback on their alcohol consumption (comparisons with medical guidelines and age and sex-specific norms), peak blood alcohol concentration, expenditure on alcohol, and risk of alcohol dependence (395/837; 47%). The two primary outcomes, assessed six months after randomization, were the number of standard drinks (10 g ethanol) consumed by participants in the last seven days and their AUDIT score.

Results: 693/837 (83%) and 635/837 (76%) participants were followed-up at 6 and 12 months, respectively. There was no statistically significant difference between the groups in the median number of standard drinks consumed in the last seven days (intervention: 12; control: 10.5; rate ratio, 1.12 [95% confidence interval, 0.96–1.31]; P = .17) or in their median AUDIT score (intervention: 7; control: 7; mean difference, 0.28 [-0.42 to 0.98]; P = .44).

Conclusion: These results do not support the implementation of an e-SBI program comprising personalized feedback and normative feedback for adults with hazardous or harmful drinking in the hospital outpatient setting.

1. Introduction

Globally, over three million deaths per annum (one in 20) are caused by alcohol consumption (World Health Organization, 2014a). Alcohol screening and brief intervention (SBI), which is "a structured set of questions designed to identify individuals at risk for alcohol use problems, followed by a brief discussion between an individual and a service provider, with referral to specialized treatment as needed" (American Public Health Association and Education Development Center Inc, 2008), is estimated to reduce alcohol consumption by 20 g per week (95% CI: −28 to −12) in non-dependent patients presenting for primary healthcare (Kaner et al., 2018). However, SBI is not well implemented despite being recommended

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by the World Health Organization (World Health Organization, 2014b) and national bodies such as the U.S. Preventive Services Task Force (Moyer, 2013), the National Institute of Clinical Excellence (National Institute for Health and Clinical Excellence (NICE), 2011), and the Royal Australian College of General Practitioners (Royal Australian College of General Practitioners, 2015). Research conducted in the USA, for example, found that only 4% of ambulatory care patients with past-month heavy episodic drinking (but not an alcohol disorder) reported being advised to decrease their alcohol consumption (Glass et al 2016). Similarly, Australian research has shown that General Practitioners provided counselling or advice in relation to alcohol at a rate of only 4 per 1000 encounters, even though one in four patients reported drinking at a level that increases their risk of harm from alcohol (hazardous drinking (World Health Organization, 1994)) or at a level that is already causing harm (harmful drinking (World Health Organization, 1994)) (Britt et al., 2013).

There is evidence that electronic screening and brief intervention (e-SBI), which refers to the delivery of key elements of traditional SBI using computers, telephones, or mobile devices, is also effective (Dedert et al., 2015; Donoghue et al., 2014; Kaner et al., 2017; Tansil et al., 2016). The primary meta-analysis (41 trials; 19,241 participants) in the most recent of these reviews found participants who received an electronic intervention drank 23 g of alcohol per week (95% CI: 15–30 g) less than participants who received no or minimal intervention (Kaner et al., 2017). However, when the primary meta-analysis was conducted separately in young people (27 trials; 13,477 participants < 29 years of age) and adults (14 trials; 5764 participants aged > 18 years), the effect was smaller in young people (-13.4 g per week; 95% CI: -19 to −8 g) than in adults (-56.1 g per week; 95% CI: -82 to -30 g) (Kaner et al., 2017). The substantial heterogeneity in both groups of trials, I^2 of 52% and 89%, respectively, calls into question the methodological quality of the trials (Fletcher, 2007). Indeed, only one of the 14 trials in adults blinded the participants, and nine used advertisements e.g., online newspapers (Brendryen et al., 2014) or Facebook (Brief et al., 2013) to recruit people who presumably were concerned about their drinking. Accordingly, there is a need for high quality research evaluating the effect of e-SBI in adults. The aim of this double-blind randomized trial was to evaluate the effect of e-SBI on hazardous or harmful drinking among adults. We recruited adults in the hospital outpatient setting because one in three people report hazardous or harmful drinking in this setting (Johnson et al., 2014), compared with one in four in primary healthcare (Britt et al., 2013) and one in five in the Australian general population (Australian Institute of Health and Welfare, 2008). The intervention we evaluated was based on social norms theory, which posits that correcting people's misperceptions about their peers' behaviour influences their own behaviour (McAlaney et al., 2011). This approach seemed reasonable given it was almost identical to an intervention shown to reduce alcohol consumption in university students (Kypri et al., 2008, 2004) and review-level evidence showing older people also "adopt or share drinking habits of their partner, family members or peers" (Kelly et al., 2018).

2. Methods

2.1. Design

We conducted a single-center, individually randomized, parallel, two-group, double-blind controlled trial (Johnson et al., 2013a,b). Ethical approval was granted by the Hunter New England (12/05/16/4.04) and the University of Newcastle (H-2012-0272) Human Research Ethics Committees, and participants provided signed consent. We registered the trial with the Australian New Zealand Clinical Trials Register (12612000905864) before recruiting the first patient.

2.2. Setting

The trial was conducted in one wing of the outpatient department in a large public hospital in Newcastle, Australia, which provides services for 870,000 people in a region the size of England (NSW Health, 2018). The clinics operating were cardio-thoracic surgery, colorectal surgery, general surgery, neurosurgery, ophthalmology, oral and maxillofacial surgery, orthopedics and rehabilitation, otolaryngology, pain management, pre-operative assessment, renal surgery and transplant, vascular disease prevention, vascular surgery, and urology.

2.3. Participants and procedure

We invited adults (18+ years) waiting for an appointment, between 28 August and 21 December 2012, who were able to read and respond to questions presented to them in English using an iPad, without assistance from anyone else, to participate. Those who consented were screened for hazardous or harmful drinking using an iPad while seated in the large central waiting area. We considered this approach necessary, despite concerns about privacy, because we had previously found that patients rushed through the online program when taken to another area to complete it, fearing they might miss their appointment (Johnson et al., 2013a,b).

2.4. Screening

The screening component of the e-SBI program comprised five screens (pages) of questions. It took approximately 5 min to complete and was delivered via an iPad without human interaction aside from technical support. Page 1 introduced the Hospital Outpatient Alcohol Project (HOAP) as a "survey of alcohol use among hospital outpatients … [that] will take approximately 5 to 15 min to complete and is confidential". Page 2 collected demographic data (gender, age, postcode [used to determine an Index of Relative Socio-economic Advantage and Disadvantage score [25]-) and email address. Page 3 asked patients if they had consumed alcohol in the last 12 months (yes/no), and page 4 asked if they were currently receiving treatment for alcohol-related problems (yes/no). Those who responded "no" and "yes", respectively, were excluded at this point. Page 5 comprised only the brief, 3-item, Alcohol Use Disorders Identification Test–Consumption subscale (AUDIT-C) (Bradley et al., 2007) because answering questions on drinking in brief intervention trials may itself alter subsequent self-reported behavior (McCambridge and Kypri, 2011). Upon clicking the continue button on page 5, AUDIT-C scores were calculated (range 0–12 with higher scores reflecting heavier drinking). We excluded participants who scored < 5 because Australian research has shown that 5 is the optimal cut-off for detecting hazardous drinking (sensitivity 91%; specificity 86%) (Vitesnikova et al., 2014). We also excluded participants who scored > 9 because, at this level of drinking, most patients are likely to be alcohol dependent (Rubinsky et al., 2010) and probably require more than brief intervention (Saitz, 2010). We referred these patients for specialist care.

2.5. Randomization, concealment, and blinding

We allocated participants in a 1:1 ratio using simple randomization (no blocking or stratification) to either electronic screening alone (control) or to electronic screening, additional assessment, and personalized feedback (intervention). We concealed treatment allocation using computer-generated random assignment (SecureRandom.random_number method (Britt and Neurogami, 2015)) via the iPads immediately following screening. We did not inform participants of the true nature of the study and asked them to participate in a series of surveys on their alcohol use without indicating they had been randomized in an intervention trial.

2.6. Intervention

The brief intervention component of the e-SBI program comprised additional assessment and personalized feedback. It took approximately 5–10 min to complete and was delivered via an iPad without human interaction aside from technical support. The additional assessment was