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Authors: Natalie A. Johnson, Kypros Kypri, Joanna Latter, Adrian Dunlop, Amanda Brown, Richard Saitz, John B. Saunders, John Attia, Luke Wolfenden, Christopher Doran, Jim McCambridge

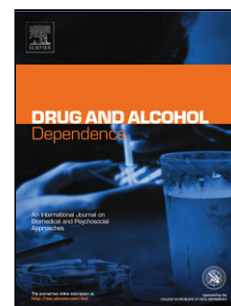
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Effect of electronic brief intervention on uptake of specialty treatment in hospital outpatients with likely alcohol dependence: Pilot randomized trial and qualitative interviews

Natalie A Johnson <sup>a</sup>, Kypros Kypri <sup>a</sup>, Joanna Latter <sup>a</sup>, Adrian Dunlop <sup>a,b</sup>, Amanda Brown <sup>a,b</sup>, Richard Saitz <sup>c</sup>, John B Saunders <sup>d</sup>, John Attia <sup>a,e,f</sup>, Luke Wolfenden <sup>a,g</sup>, Christopher Doran <sup>h</sup>, Jim McCambridge<sup>i</sup>

<sup>a</sup> School of Medicine and Public Health, The University of Newcastle, Callaghan, NSW, 2308 Australia;

<sup>b</sup> Hunter New England Local Health District Drug and Alcohol Clinical Services, Newcastle, NSW, 2300, Australia;

<sup>c</sup> Department of Community Health Sciences, Boston University School of Public Health, Clinical Addiction Research and Education Unit, Department of Medicine, Boston University School of Medicine and Boston Medical Center, Boston, Massachusetts, 02118, USA;

<sup>d</sup> Centre for Youth Substance Abuse Research, University of Queensland, Herston, 4006, Australia;

<sup>e</sup> Department of General Medicine, John Hunter Hospital, New Lambton Heights, NSW, 2305, Australia;

<sup>f</sup> Hunter Medical Research Institute, New Lambton Heights, NSW, 2305, Australia;

<sup>g</sup> Hunter New England Local Health District Population Health, Wallsend, NSW, 2287, Australia;

<sup>h</sup> School of Human Health and Social Sciences, Central Queensland University, Brisbane, 4000, Australia;

<sup>i</sup> Department of Health Sciences, University of York, Heslington, York, YO10 5DD, UK

# **Correspondence:**

Natalie A. Johnson

Level 4 West, HMRI Building

The University of Newcastle

University Drive, Callaghan, NSW, 2308, Australia.

Natalie.johnson@newcastle.edu.au

## Highlights

- Treatment rates for alcohol dependence are low.
- This pilot trial tested the effect of electronic brief intervention on treatment uptake.
- Participants were hospital outpatients with likely alcohol dependence.
- Uptake of specialty treatment was poor and brief intervention made no difference.
- A large scale trial does not appear to be feasible.

## Abstract

Background: A large proportion of hospital outpatients are alcohol dependent (AD) but few are engaged in treatment for their drinking. Brief intervention, designed to raise patients' awareness of their drinking, might encourage uptake of referral to specialty treatment. We assessed the feasibility of conducting a randomized trial evaluating the effectiveness of electronic brief intervention on the uptake of specialty treatment in hospital outpatients with likely AD.

Methods: This study was conducted in the outpatient department of a large public hospital in Newcastle, Australia. We randomly assigned adults who scored  $\geq 10$  on the AUDIT-C and were not currently receiving treatment for their drinking to electronic brief intervention (comprising an assessment of their drinking and personalized feedback) and referral (n=59), or to referral alone (n=64). We pre-specified two co-primary outcomes as the proportions of patients who (1) accepted and (2) attended a Drug and Alcohol outpatient clinic appointment. We interviewed 15 study participants to investigate why they had declined the appointment and what sort of help they might prefer to receive.

Results: Ten patients (five in each group) accepted an appointment, and one patient (control) attended. Most interviewees' did not see their drinking as a problem or were confident they

could manage it by themselves. Those who identified a preferred source of help expressed a preference for treatment by a GP.

Conclusion: Uptake of specialty treatment in hospital outpatients with likely AD was low regardless of whether they received brief intervention. Accordingly, a large randomised trial does not appear to be feasible.

**Keywords:** alcohol dependence, outpatients, screening, brief intervention, referral, electronic

## 1. Introduction

Alcohol dependence (AD), defined by the WHO as “a cluster of physiological, behavioural, and cognitive phenomena in which the use of [alcohol] takes on a much higher priority for a given individual than other behaviours that once had greater value” (World Health Organization, 1992), significantly increases an individual’s risk of all-cause mortality (Laramee et al., 2015). Despite this, treatment rates for AD are low. For example, only 12%-13% of the people with AD who participated in two large national surveys on alcohol use reported having had specialist treatment for an alcohol use disorder (Edlund et al., 2012). This is a concern given that only one-third of people with AD remit within the first decade after the onset of dependence (Lopez-Quintero et al., 2011), and the evidence suggesting that an increase in treatment coverage to 40% would reduce alcohol-attributable mortality by 13% in men and 9% in women (Rehm et al., 2013).

Screening and brief intervention is the currently accepted evidence-based approach to reducing risky drinking among patients presenting for healthcare (Moyer, 2013; National Institute for Health and Clinical Excellence (NICE), 2011; Royal Australian College of General Practitioners, 2016). This relatively low cost strategy has been shown to reduce alcohol consumption by 41 grams per week (95% CI: -57 to -25) in non-dependent patients presenting to primary care (Kaner et al., 2007) but it is not widely implemented (Bachhuber

and Bradley, 2016; Nilsen, 2010). Barriers to implementation include providers' attitudes and knowledge about alcohol and concerns about the effect of addressing alcohol use on relationships with patients (Derges et al., 2017; Johnson et al., 2011). Electronic screening and brief intervention refers to the delivery of key elements of traditional screening and brief intervention using computers, telephones or mobile devices. It has been judged effective in non-dependent drinkers (Tansil et al., 2016) and has the advantage of circumventing provider-level barriers. However, there is no evidence that brief intervention is effective in patients with very heavy use or dependence (Saitz, 2010), and it is standard practice for dependent drinkers who "typically need more intensive treatment" to be referred for specialty treatment (American Public Health Association and Education Development Center Inc, 2008).

As discussed elsewhere, referral to treatment alone is unlikely to motivate patients who are not seeking treatment for their drinking to do so (Bachhuber and Bradley, 2016). Given the purpose of brief intervention "is to increase the person's awareness of his or her alcohol use and its consequences and then motivate the person to either reduce risky drinking or seek treatment" (American Public Health Association and Education Development Center Inc, 2008), it is plausible that brief intervention would increase the uptake of specialty treatment in patients with likely AD if it were to be delivered immediately prior to an explicit referral. Although systematic reviews have failed to find evidence that brief intervention increases the uptake of alcohol-related services (Glass et al., 2015; Glass et al., 2016; Simioni, Cottencin, et al., 2015; Simioni, Rolland, et al., 2015) most of the trials included in these reviews were not designed to assess this (Glass et al., 2015). In addition, only four trials contained sufficient data for outcome analyses in the subgroup of dependent drinkers (Bischof et al., 2008; Kuchipudi et al., 1990; Liu et al., 2011; Saitz et al., 2007). Accordingly, there is a need for rigorous trials testing the effectiveness of brief intervention on the uptake

of specialty treatment with referral to treatment as a primary outcome among dependent drinkers.

The aim of this pilot trial was to determine the feasibility of conducting a definitive trial testing the effect of electronic brief intervention on the uptake of specialty treatment in hospital outpatients with likely AD. We chose the hospital outpatient setting because the prevalence of risky drinking is high there: one in three patients in this setting report risky drinking (15% of whom may be dependent) (Johnson et al., 2014), compared with one in four in the primary care setting (Britt et al., 2013) and one in five in the general population in Australia (Australian Institute of Health and Welfare, 2014). We conducted telephone interviews once it became apparent that few participants were accepting an appointment, to investigate why they had declined the appointment and what sort of help they might prefer to receive.

## **2. Methods**

### **2.1. Design**

We conducted a pilot parallel-group, individually randomized trial (Figure 1) followed by semi-structured telephone interviews. The Hunter New England (HNEHREC Ref: 12/05/16/4.04) and University of Newcastle (H-2012-0272) human research ethics committees approved the study, and the trial was registered with the Australian New Zealand Clinical Trials Registry (ANZCTR12612000919819).

### **2.2. Setting**

We conducted the study in one wing (South Block) of the outpatient department at a large public hospital in Newcastle, Australia. The clinics operating in South Block are: 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 capable of self-administering the online program using an iPad and who were not moving to an as yet unknown address to participate. Consenting outpatients were screened for likely AD using an iPad while seated in the large central waiting area. We considered this approach necessary, despite concerns about privacy, because we have previously found that patients rushed through the online program when taken to another area as they were worried about missing their appointment even though pagers had been provided (Johnson et al., 2013).

### **2.4. *Screening***

The web browser on the iPad displayed the online program as a series of screens of content (pages). 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 minutes to complete and is confidential” and page 2 collected demographic data (gender, age, postcode and email address). Page 3 asked patients if they had consumed alcohol in the last 12 months (yes/no), and page 4 asked them 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 the brief (3-item) Alcohol Use Disorders Identification Test – Consumption subscale (AUDIT-C) (Bradley et al., 2007) because there is evidence that more extensive screening may itself reduce self-reported drinking (McCambridge and Kypri, 2011). We recruited patients who scored  $\geq 10$  on the AUDIT-C as research had shown that 75% of men and 88% of women with AUDIT-C scores 10–12 met standardized interview criteria for past-year alcohol dependence (Rubinsky et al., 2010).



More recent research has shown that an AUDIT-C score  $\geq 10$  has sensitivity and specificity of 21.5% and 98.5%, respectively, when used as a screener for DSM-IV dependence in past-year drinkers aged  $\geq 21$  years, and sensitivity and specificity of 25.0% and 98.5%, respectively, when used as a screener for DSM-5 severe alcohol use disorder (Dawson et al., 2012).

### **2.5. Randomization and Blinding**

Immediately after screening but prior to referral for treatment, participants were randomly assigned to electronic brief intervention and referral (intervention) or to referral alone (control) in a 1:1 ratio using simple randomization (no blocking or stratification). Treatment allocation was concealed by use of computer-generated random assignment (SecureRandom.random\_number method in Ruby) and effected immediately following screening via the iPads. Participants were also blind to the true nature of the study, which was presented as a series of surveys on their alcohol use, to reduce possible research participation effects (McCambridge et al., 2014).

### **2.6 Referral**

All participants were referred to the Drug and Alcohol outpatient clinic located in the other wing (North Block) of the outpatient department. The last page of the online program advised patients “Your score on the screening questions indicates that you may benefit from changing your drinking habits. You will probably find it easier to do this by getting help. The Drug and Alcohol outpatient clinic operates in North Block of the Ambulatory Care Centre on Friday afternoons between 2.00pm and 4.30pm. Would you like Hunter New England Health staff to send you a letter with an appointment for this clinic?” The four response options were: (i) yes, (ii) I’d like someone from Hunter New England Health to phone me to arrange another time because I cannot attend the clinic on a Friday afternoon; (iii) please ask me again 3 months from now; and (iv) no. After three months, a letter was sent to participants

who had chosen the third response option asking if they would like the health service to contact them to organise an appointment at the Drug and Alcohol outpatient clinic.

## **2.7 Brief Intervention**

The electronic brief intervention took approximately 5-10 minutes and was delivered by an iPad without human interaction, aside from technical support. Participants were asked to complete the rest of the AUDIT (Saunders et al., 1993), the 10-item Leeds Dependence Questionnaire (Raistrick et al., 1994), questions regarding the largest number of standard drinks consumed on a single occasion in the preceding four weeks, the duration of the drinking episode in hours, and their body weight (so we could estimate their peak blood alcohol concentration). After this, personalized feedback comprising the following was provided: their AUDIT and LDQ scores with guidance on their meaning, an estimated blood alcohol concentration for the heaviest drinking episode with information on the their traffic crash relative risk, an estimate of their yearly expenditure on alcohol, and bar graphs comparing their typical episodic and weekly consumption with medical recommendations (National Health and Medical Research Council, 2009), and that of adults of the same age and gender (Australian Institute of Health and Welfare, 2008). Three additional pages offering information about alcohol, tips for reducing the risk of harm, and sources of support for drinking problems were provided. We sent a copy of the feedback to participants who were agreed to that. The program can be found at <https://esbi.herokuapp.com/>

## **2.8 Outcomes**

We pre-specified two co-primary outcomes as the proportions who (1) accepted and (2) attended a Drug and Alcohol outpatient clinic appointment. The former was recorded by the research team while the latter was ascertained by accessing the clinic appointment system six months after randomization. Seven secondary outcomes were assessed six and 12 months after randomization. Those relating to alcohol consumption were: (1) AUDIT score (Saunders

et al., 1993) with a reference period of the past six months, (2) number of standard drinks consumed in the past week, (3) number of days alcohol was consumed in the past week; (4) average number of standard drinks per drinking day; (5) whether the participant exceeded guidelines for acute risk (>40g ethanol on at least one occasion) (National Health and Medical Research Council, 2009); and (6) whether the participant exceeded guidelines for chronic risk (>140g ethanol over the 7-day period) (National Health and Medical Research Council, 2009). Outcome (7) was self-reported healthcare utilization. We used a 7-day retrospective report (Rehm, 1998) to assess secondary outcomes (2-6), and devised a question to assess outcome (7): participants (who responded “yes, during the last 6 months” to the AUDIT question “Have you sought help to reduce your drinking?”) were asked: “Which services did you use?” Response options were: “I saw my GP or another doctor”, “I saw a psychologist or counsellor”, “I attended a self-help group (e.g., Alcoholics Anonymous)”, “I used a self-help program on the internet”, and “Other (please specify)”.

## **2.9 Follow-up and Minimization of Attrition**

We sent a letter advising participants they would receive a brief follow-up questionnaire in a few days’ time six months (March to July 2013) and 12 months (September 2013 to January 2014) months after randomization. A \$20 supermarket voucher (which could not be used to purchase alcohol) was enclosed as a token of appreciation. Participants who had provided an email address were sent a unique hyperlink to the brief web-based follow-up questionnaire, while those who had not were sent a paper questionnaire. Up to three email/postal reminders were sent and non-responders were followed-up by telephone.

## **2.10 Interviews**

All participants who responded “yes” to the question “Would you be willing to take part in a brief telephone interview about how we might improve the way care is provided to

patients with unhealthy drinking?”, which was embedded in the 12-month follow-up questionnaire, were called by a Drug and Alcohol Counsellor with research experience. The semi-structured telephone interviews commenced with open-ended questions (e.g., “can you tell me a bit about your drinking?”) and ended with the following questions:

(1) “About a year ago, you completed a questionnaire about your use of alcohol on an iPad while you were waiting for an appointment at the John Hunter Hospital. At that time, you declined an appointment at the outpatient Drug and Alcohol outpatient clinic. Can you tell me what led to that decision? Probes: What would have needed to happen differently for you to consider accepting an appointment?; Would it have made a difference if you could have spoken to someone then and there rather than return to the hospital for a separate appointment?”

(2) “If you wanted help with cutting down your drinking now or in the future, what sort of help would you like/who do you think could help you? Probes: Would you try to do it by yourself? If so, how (e.g., using a website)?; Would you choose some type of professional? If so, who / what type?; Would you seek help from a special clinic?; Would you prefer alcohol help separate from your medical care?; What about AA?”

### **2.11 Analysis**

Trial data were analyzed using STATA 13 (StataCorp LP, College Station, TX). Participants were analyzed in the group to which they were randomized (intention to treat). Primary and secondary outcomes were compared between the groups using the chi-square test for categorical variables and the two-sample Wilcoxon rank-sum test for continuous variables. The qualitative data were analyzed using NVIVO (QSR International, Melbourne, Vic., Australia). The interviews were digitally recorded, imported into the software program, and audio-coded using a style of thematic analysis known as Template Analysis (Brooks et al., 2015). This approach involves the development of a coding template, usually on the basis

of a subset of data, which is then applied to further data, revised and refined (Brooks et al., 2015). NAJ and JL coded the data using five *a priori* themes developed by Probst and colleagues: “lack of problem awareness”, “cope alone”, “stigma or shame”, “other prominent problem”, and “encounter barriers” (specifically (i) lack of possibility or knowledge, (ii) lack of time, (iii) asked for help but did not get any, (iv) treatment was not affordable, (v) wish not to stop drinking, (vi) treatment was not seen as an option, (vii) no trust in treatment system, (viii) the help needed was not offered) (Probst et al., 2015). New themes were developed for data that did not fit within any of the aforementioned *a priori* themes.

### 3. Results

#### 3.1 Recruitment, Screening, Group Allocation and Retention

The flow of participants through the trial is shown in Figure 1. Participant demographic characteristics are summarized in Table 1.

#### 3.2. Primary Outcomes – (1) Acceptance of Referral and (2) Clinic Attendance

Ten patients (five in the control group and five in the intervention group) accepted an appointment, and one patient (control) attended (Table 2).

#### 3.3. Secondary Outcomes – Alcohol Consumption and Help-Seeking Behaviour

There were no significant differences between the groups for any of the secondary outcomes at the 6-month (Table 3) and 12-month (Table 4) follow-ups.

#### 3.4. Interview Sub-Study

We interviewed 15 study participants (14 men and one woman). The median ages (interquartile range) of the interviewees and non-interviewees were 45 (38, 59) and 37.5 (24, 52), respectively ( $p = .10$ ). The median number of standard drinks consumed in the last seven days (interquartile range) at the time of the 12 month follow-up was 32 (11, 45) and 28 (18, 55) by interviewees and non-interviewees, respectively ( $p = .80$ ).

The interviewees' reasons for not accepting or attending the specialist appointment were consistent with the a priori themes. The only new theme identified was a preference for "treatment by a GP".

A "lack of problem awareness" was evident in responses to the question and probes investigating the interviewees' reasons for declining the specialist appointment:

*I probably did decline it because I felt like I didn't really need it, I didn't really feel like it was applicable, would be wasting time and resources* (#231; a 30 year-old man who had an AUDIT-C score of 10 at baseline, and 8 at the 12-month follow-up, who reported consuming 21 drinks per week at the 12-month follow-up)

A desire to "cope alone" was also evident:

*I saw myself as being able to fix the problem if I wanted to* (#533; a 71 year-old man, who had an AUDIT-C score of 10 at baseline and 5 at the 12-month follow-up, who reported consuming 11 drinks per week at the 12-month follow-up)

"Stigma or shame" was mentioned by one interviewee but only in response to a probe asking if they would seek help from an organization such as Alcoholics Anonymous:

*I still feel there's a stigma around that, that you are sort of validating in a big way that you're an alcoholic because of the name, the branding, the connotation of that kind of space* (#231; a 30 year-old man who had an AUDIT-C score of 10 at baseline, and 8 at the 12-month follow-up, who reported consuming 21 drinks per week at the 12-month follow-up)

“[An]other problem” was mentioned as the reason for not accepting the appointment by one interviewee:

*I think cancer was more on my mind than drinking at the time (#2751; a 53 year-old man who had an AUDIT-C score of 12 at baseline, and a missing AUDIT-C score at the 12-month follow-up, who reported consuming 30 drinks per week at the 12-month follow-up)*

In terms of the “barriers” to treatment, one interviewee expressed a “wish not to stop drinking”:

*I don't think I ever will [seek help] ... there's no chance of me, you know, giving up the booze... I knock myself out every night with alcohol ... I reckon 2 nights trying to stay sober, I'd be looking for a fricken rope ... I get pissed and I'm right, I'm not going to harm myself when I'm pissed (#1365; a 47 year-old man who had an AUDIT-C score of 12 at baseline, and 12 at the 12-month follow-up, who reported consuming 111 drinks per week at the 12-month follow-up).*

Given that many of the interviewees did not see their drinking as a problem or were confident they could manage it by themselves, many did not identify a preferred source of help. Those who did, expressed a preference for treatment by a GP:

*I'd either do it myself and if there was any problem there I'd see a GP (#327, a 45 year-old man who had an AUDIT-C score of 12 at baseline, and 9 at the 12-month follow-up, who reported consuming 38 drinks per week at the 12-month follow up)*

#### 4. Discussion

The results suggest it would not be feasible to conduct a definitive trial testing the effect of electronic brief intervention on the uptake of specialty treatment in hospital outpatients with likely AD because only 8% (10/123) of the participants accepted an appointment and only one participant attended, even though the referral was explicit and made under conditions designed to minimise barriers to uptake, i.e., we offered them an appointment at no-cost (in the context of universal healthcare), within a week, at an outpatient clinic operating in the same hospital. These findings are consistent with the results of a study conducted with 212 emergency department patients with risky alcohol use, where 6% (6/97) of the patients who received web-based screening, brief intervention and referral to treatment (intervention group) attended an appointment compared to 7% (8/115) of patients who received a printed list of local providers (control group) (Haskins et al., 2017). Haskins and colleagues suggested the low level of interest in specialized treatment in their sample was due to the fact that most (82%) had scored in the low-to-moderate risk range on the AUDIT (Haskins et al., 2017). Our findings, however, do not support this view given that the level of interest in specialized treatment was no higher in our sample of patients with likely AD.

Most of our interviewees declined the offer of specialty treatment because they did not see their drinking as a problem. This is consistent with the findings of a study conducted with 32 non-treatment seeking adults with AD which found that participants tended to view their drinking “as a bad habit ... [that] can be altered by changes made in everyday life”, possibly because they viewed “treatment seeking ... as surrendering to the stereotypical identity of “the alcoholic”, typically characterized as a drunkard on a park bench” (Wallhed Finn et al., 2014). Our findings are also consistent with a study showing that half of the European primary care patients who fulfilled at least four DSM-5 criteria for alcohol use



disorder in the past 12 months stated they did not have a problem with alcohol (Probst et al., 2015). Other reasons for not seeking treatment included stigma or shame (21%), a wish to cope alone (21%), barriers (e.g., the wish to continue drinking) and the presence of another prominent problem (1.3%) (Probst et al., 2015). Our finding that interviewees would prefer treatment from a GP is also consistent with research reported by Wallhed Finn and colleagues, who found that primary care was viewed “as an attractive option”, particularly among people aged 40-65 years, because “it would be a smaller step to take and less stigmatizing compared with specialist clinics” (Wallhed Finn et al., 2014).

Strengths of our study include the objective measurement of the primary outcomes, and the blinding of participants, researchers, and administrative staff to the trial design and thereby treatment allocation. There are, however, a number of limitations that could explain the low uptake of specialty treatment we observed. First, participants may not have been dependent on alcohol, however this seems unlikely given that at least 20% of the sample had a score  $\geq 20$  on the AUDIT as baseline (i.e., 24 of the 55 participants who completed the AUDIT as part of the brief intervention). Second, participants may not have been motivated to accept or attend the appointment because they did not read the feedback provided, or because the personalized feedback provided was insufficient to motivate patients with likely AD to accept specialty treatment, despite its ability to motivate non-dependent drinkers to reduce their alcohol consumption in some populations [e.g., (Kypri et al., 2008)]. Third, participants may have declined the appointment because they did not want to return to the hospital outpatient department, having to take more time off work, or because parking at the hospital is difficult and/or expensive. Accordingly, uptake may have been higher if a same-day appointment had been available (Williams et al., 2005). While none of the interviewees said returning to the hospital was a barrier to taking up the referral, their recall may have been poor because the interviews were conducted more than 12 months after the referral. Finally,

as patients with likely AD were not consulted in the intervention development stage [i.e., because the intervention was developed for non-dependent drinkers (Johnson et al., 2013)], the electronic brief intervention or the electronic referral used may not have met their needs. Again, none of the comments made by the interviewees suggested this was the case but their recall may have been poor.

In conclusion, the uptake of specialty treatment among hospital outpatients with likely AD was low regardless of whether they received electronic brief intervention. Given that most of the participants we interviewed did not see their drinking as a problem or were confident they could manage it by themselves, few identified a preferred source of help. Those who did expressed a preference for treatment by a GP. This is not particularly useful given that there are many barriers to the provision of alcohol screening and brief intervention in the primary care setting (Derges et al., 2017), that efforts to overcome these barriers have not been successful (van Beurden et al., 2012), and recent research showing that only 7% of regular/chronic drinkers attending primary care were referred to treatment (Sahker and Arndt, 2017). Accordingly, it remains unclear how to engage this non-treatment-seeking high-risk group.

### **Author Disclosures**

### **Registration**

Australian New Zealand Clinical Trials Registry ANZCTR N12612000919819

### **Contributors**

NAJ obtained funding for the primary trial and present study, managed the trial, performed template analysis and wrote the final draft of the manuscript. KK developed the study concept, obtained funding for the primary trial and present study, oversaw the study and wrote the initial draft of the manuscript. JL performed data collection, statistical analysis and template analysis. AD obtained funding for the primary trial and present study, and oversaw

the specialist counselling and qualitative interviews. AB obtained funding for the present study, and oversaw the specialist counselling and qualitative interviews. RS, JBS, JA, LW, CD and JM obtained funding for the primary trial. All authors contributed to study design, interpretation of the results, and have approved the final manuscript.

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### **Conflict of Interest**

No conflict declared.

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## Figure Legends

Figure 1. Trial flow diagram

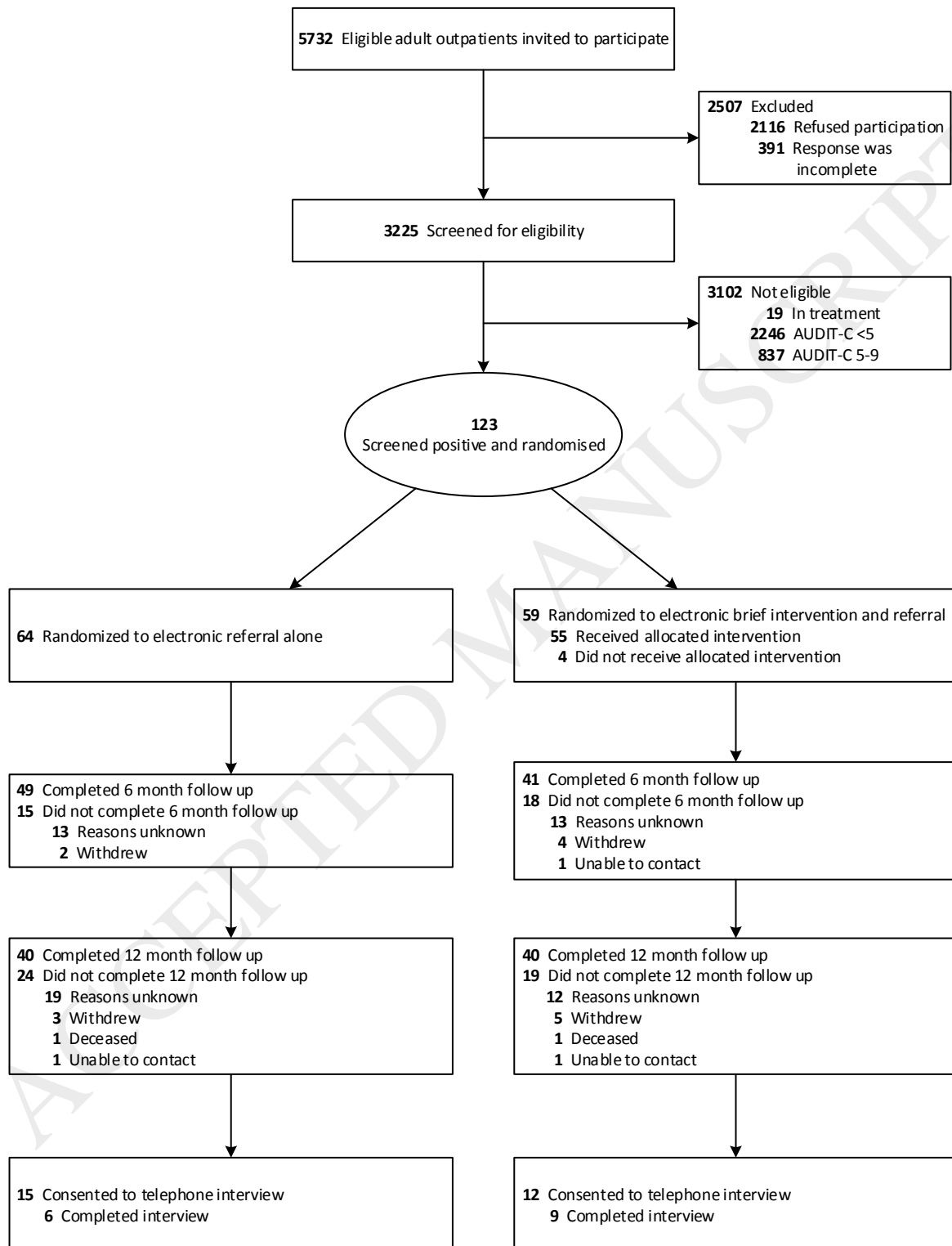


Fig. 1.

**Table 1**

Characteristics of Trial Participants at Baseline.

	Control (n=64)	Intervention (n=59)
Male gender, n (%)	58 (91)	55 (93)
Age group, n (%)		
18-24 years	15 (23)	17 (29)
25-39 years	17 (27)	11 (19)
40-59 years	23 (36)	24 (41)
60+ years	9 (14)	7 (12)
AUDIT-C, median (25th and 75th percentiles)	10 (10, 11)	10 (10, 11)

**Table 2**

Number (%) of Participants who Accepted and Attended a Specialist Appointment, Overall and by Group Assignment.

	All participants (n=123)	Control (n=64)	Intervention (n=59) <sup>a</sup>	<i>p</i> - value
Primary outcome 1: Accepted appointment, n (%)	10 (8.1)	5 (7.8)	5 (8.4)	0.78 <sup>b</sup>
- Accepted appointment at baseline, n (%)	8 (6.5)	4 (6.3)	4 (6.8)	
- Requested a 3-month reminder, n (%)	12 (9.8)	8 (12)	4 (6.8)	
- Accepted appointment at reminder, n (%)	2 (1.6)	1 (1.6)	1 (1.7)	
Primary outcome 2: Appointment attended, n (%)	1 (0.008)	1 (1.6)	0 (0.0)	0.36 <sup>b</sup>

<sup>a</sup> 54 participants received e-SBIRT and 5 did not as they were called for their appointment

<sup>b</sup> Chi-squared test

**Table 3**

Participants Self-reported Alcohol Consumption and Help-seeking Behaviour at the Time of the 6-month Follow-up, Overall and by Group Assignment.

	All participants (n=89)	Control (n=49)	Intervention (n=40)	p-value
AUDIT score with a 6-month reference period, median (25 <sup>th</sup> percentile, 75 <sup>th</sup> percentile)	14 (10, 23)	14 (10, 21)	14.5 (10, 23.5)	0.61 <sup>a</sup>
Number of standard drinks consumed in the past week, median (25 <sup>th</sup> percentile, 75 <sup>th</sup> percentile)	29 (15, 50)	32 (15, 66)	23 (15, 45.5)	0.33 <sup>a</sup>
Number of days alcohol was consumed in the past week, median (25 <sup>th</sup> percentile, 75 <sup>th</sup> percentile)	5 (3, 7)	5 (2, 7)	5 (3, 7)	0.94 <sup>a</sup>
Average number of standard drinks per drinking day, median (25 <sup>th</sup> percentile, 75 <sup>th</sup> percentile)	4.1 (2.1, 7.1)	4.6 (2.1, 9.4)	3.3 (2.1, 6.5)	0.33 <sup>a</sup>
Participant exceeded guideline for acute risk (>40g ethanol on at least one occasion), n (%)	79 (89)	43 (88)	36 (90)	0.53 <sup>b</sup>
Participant exceeded guideline for chronic risk (>140g ethanol in a 7-day period), n (%)	71 (80)	40 (82)	31 (78)	0.49 <sup>b</sup>
Sought help in the past 6 months, n (%) <sup>c</sup>	11 (12)	5 (10)	6 (15)	0.42 <sup>b</sup>
- Saw a GP or another doctor	6 (6.7)	2 (4.1)	4 (9.8)	
- Saw a psychologist or counsellor	5 (5.6)	1 (2.0)	4 (9.8)	
- Attended a self-help group	4 (4.5)	1 (2.0)	3 (7.3)	
- Used a self-help program on the internet	2 (2.2)	2 (4.1)	0 (0.0)	
- Other	3 (3.4)	2 (4.1)	1 (2.4)	

<sup>a</sup> Two-sample Wilcoxon rank-sum (Mann-Whitney) test

<sup>b</sup> Chi-squared test

<sup>c</sup> n=90 participants (n=49 control, n=41 intervention)

**Table 4**

Participants Self-reported Alcohol Consumption and Help-seeking Behaviour at the time of the 12-month Follow-up, Overall and by Group Assignment.

	All participants (n=77)	Control (n=38)	Intervention (n=39)	p-value
AUDIT score with a 6-month reference period, median (25 <sup>th</sup> percentile, 75 <sup>th</sup> percentile)	14 (9, 22)	13 (10, 21)	15 (9, 22)	0.71 <sup>a</sup>
Number of standard drinks consumed in the past week, median (25 <sup>th</sup> percentile, 75 <sup>th</sup> percentile)	30 (18, 53)	31.5 (19, 53)	27 (16, 53)	0.60 <sup>a</sup>
Number of days alcohol was consumed in the past week, median (25 <sup>th</sup> percentile, 75 <sup>th</sup> percentile)	5 (3, 7)	5.5 (3, 7)	5 (3, 7)	0.68 <sup>a</sup>
Average number of standard drinks per drinking day, median (25 <sup>th</sup> percentile, 75 <sup>th</sup> percentile)	4.3 (2.6, 7.6)	4.5 (2.7, 7.6)	3.9 (2.3, 7.6)	0.60 <sup>a</sup>
Participant exceeded guidelines for acute risk (>40g ethanol on at least one occasion), n (%)	62 (81)	32 (84)	30 (77)	0.54 <sup>b</sup>
Participant exceeded guidelines for chronic risk (>140g ethanol over the 7-day period), n (%)	61 (79)	31 (82)	30 (77)	0.66 <sup>b</sup>
Sought help in the past 6 months (n, %) <sup>c</sup>	14 (18)	6 (15)	8 (21)	0.67 <sup>b</sup>
- Saw a GP or another doctor	9 (11.5)	3 (7.5)	6 (15.8)	
- Saw a psychologist or counsellor	8 (10.3)	3 (7.5)	5 (13.2)	
- Attended a self-help group	0 (0.0)	0 (0.0)	0 (0.0)	
- Used a self-help program on the internet	0 (0.0)	0 (0.0)	0 (0.0)	
- Other	7 (9.0)	2 (5.0)	5 (13.2)	

<sup>a</sup> Two-sample Wilcoxon rank-sum (Mann-Whitney) test

<sup>b</sup> Chi-squared test

<sup>c</sup> n=78 (n=40 control, n=38 intervention)