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Critical role of general practitioners in preventing readmission following emergency department alcohol screening and brief intervention management of alcohol-related problems

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Original Research

Critical Role of General Practitioners in Preventing Readmission Following Emergency Department Alcohol Screening and Brief Intervention Management of Alcohol-Related Problems

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Abstract

Introduction/Objectives: Alcohol screening and brief intervention (ASBI) strategies are useful in general practice (GP) but their effectiveness in the emergency department (ED) is unclear. We evaluated the effect of ED-based ASBI on re-admissions.

Methods: 453 ED subjects exceeding the threshold score on the three-item Alcohol Use Disorders Identification Test-Consumption (females 3+: males 4+) were randomized. We conducted telephone follow-up at 1 and 3 months and recorded hospital events 6 months pre- and post-enrolment.

Results: Median weekly alcohol use was 20 standard drinks (interquartile range (IQR) 9-45) on enrolment. After 3 months, 247 (55%) were able to be re-interviewed. Median alcohol use was 10 drinks (IQR 4-26). Six months later, subjects receiving ED-ASBI without GP follow-up had significantly greater risk of re-admission compared with those having GP follow-up (OR 1.68, 95%CI 1.06-2.65; P = .028).

Conclusions: ASBI reduces the likelihood of ED re-presentation only in subjects who have GP follow-up. The study has been registered as a clinical trial (Australian and New Zealand Clinical Trial Registry ACTRN12617001254381).

Introduction

Globally, alcohol consumption accounted for 5.1% of disease burden and more than 3 million deaths in 2016.[1] In Australia, alcohol-related costs were more than $14.3 billion in 2010, including $1.68 billion in health care.[2] Alcohol-related events account for about 10% of emergency department (ED) presentations.[3]

Despite the impact of alcohol misuse, 1 in 6 Australians drink alcohol at a level that increases their lifetime risk of alcohol-related disease or injury.[4] Providing a point of time to facilitate reflection on personal alcohol consumption is a potentially powerful opportunity for those who are willing to change. Brief interventions have been shown to be effective when delivered by a range of practitioners, in particular nurses,[4] although effects tend to be greater in GP than in the ED.[5-7]

The ED is well placed for alcohol screening and brief intervention (ASBI). Although ASBIs have demonstrated effectiveness in primary care with adults,[7] their impact in the ED has been equivocal.[8] Despite this inconsistency,

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ASBI with referral to treatment is recommended by the World Health Organization and advocated by the Australasian College for Emergency Medicine.[9,10]

Identifying at-risk individuals allows the ASBI process to be coupled with further support such as referral to specialist care in the community (eg, GP or acute treatment centers). Given the proven effectiveness of ASBI delivered in primary care,[7] we evaluated the impact of ASBI in an ED-setting either followed by referral to a known GP (ASBI+GP) or without any specific recommendation to the GP (ASBI) at discharge. We hypothesized the ASBI+GP group would have lower alcohol measures (Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) score and standard drinks) at 3 months plus a lower rate of hospital presentations at 6-months than the ASBI group.

Methods

Participants

Participants were aged ≥18 years; exceeded the threshold score on the three-item AUDIT-C (moderate risk: females 3-7: males 4-8: high-risk: females 8+: males 9+);[11] had a telephone; had a GP; and, understood English. Those participants who did not report a current GP could participate, but were not eligible for randomization. Those in police custody, and pregnant women, were ineligible. At recruitment, participants completed a drinking diary[12] estimating their alcohol consumption in the previous 7 days. The sample target of 582 was based on a small effect (f=0.06, equivalent Cohen's d=0.14) with repeated measures (baseline, one, 3 months) to give a power of 0.8. Due to funding constraints, recruitment had to close with only 403 enrolled in the randomized groups.

Outcome Measures

Alcohol use was assessed in terms of alcohol risk scores (AUDIT-C)[11] and a 7-day drinking diary in terms of standard drinks (10 g alcohol)[12] and finally, alcohol-related hospital events were identified via electronic hospital records from the ICD-10 codes used by Egerton-Warburton et al,[13] except for intentional or unintentional injuries caused by a third party affected by alcohol (Appendix 1). We also asked participants about use of GP and other health services, including if any GP visit was alcohol related.

Study Design

The AUDIT-C assessment was added to the nursing admission process for all patients admitted to the emergency short stay unit (ESSU), where the ASBI was delivered. All nurses conducting the AUDIT-C and brief intervention completed an education and training module and were supported by the research nurses, throughout the study. The ESSU is used for individuals who require assessment and/or management for up to 24 hours. As such, there is greater scope to approach individuals and discuss alcohol use when required. Participants exceeding the AUDIT-C threshold received a brief motivational enhancement intervention. A clinical nurse consultant (CNC) trained the research nurses in brief interventions, including: discussing the benefits and harms that individuals perceived from alcohol; relating the current presentation to alcohol where possible; enhancing self-efficacy in behavioral change; and providing options to change behavior. AUDIT-C questions were administered as previously described.[12] Individuals scoring in the high-risk range were referred for further intervention with the CNC. The research nurses provided seven-day, business hours coverage. For those in the ASBI+GP referral group, in addition to treatment-as-usual and information provision at discharge, a referral letter was sent with the screening results and a request that the GP use their clinical judgment in discussing alcohol use at the next consultation. Participants in the ASBI without GP referral group (ASBI) or those who did not have a GP (No GP) received treatment-as-usual and information-only at discharge.

Randomization

Using SPSS randomization function, 2 blocks of codes (moderate and high-risk) were generated by RJT. Codes, in numbered, opaque, sealed envelopes were opened once screening was completed by the research nurse.

Statistical Analysis

Descriptive data were collected at baseline, 1 and 3 months for AUDIT-C and standard drinks-per-week and analyzed using standard parametric and non-parametric tests. We compared the use of health services outside the hospital system using chi-square analysis. The intervention was assessed with generalized estimating equations to account for the correlated data structure. The critical measure was the time (baseline, 1, 3 months) by group (ASBI+GP, ASBI, no GP) interaction for AUDIT-C scores and standard drinks-per-week. We also assessed the change in alcohol-related hospital events (admissions plus ED presentations) in the 6 months pre- and post-intervention. These data were assessed using a negative binomial distribution with log-link function. The standard drinks measure was log transformed prior to analysis due to its skewed distribution.

Ethics

The research was conducted according to the World Medical Association Declaration of Helsinki. The South Metropolitan

Health Service Human Research Ethics Committee approved the study (RGS0377). Due to the minimal intensity, and the belief that the study followed best practice, the committee authorized it on an "opt out" basis. Notably, once "at-risk" alcohol use was identified, the hospital and researchers were ethically obliged to offer intervention of some type. Referring those at "high-risk" to the CNC was consistent with the hospital's standard procedure.

Results

We registered 603 people who screened positive on the AUDIT-C. Sixty-four (10.6%) opted out; 72 (11.9%) were ineligible (no phone n = 42, unable to consent n = 16, not based in Western Australia n = 8, other n = 6); and 64 (10.6%) had no GP but consented to the research (No GP group), leaving a study cohort of 467 (77.4%). Of these, 403 who had a GP were randomized to the ASBI+GP or ASBI groups; 14 (3%) people subsequently withdrew, leaving a final cohort of 453 (Figure 1). As shown in Table 1, the mean age was 46 (SD 19) years, with most being male (253, 56%). Median alcohol use was 20 standard drinks-per-week (interquartile range (IQR) 9-45 drinks). The only statistically significant difference between the groups was age: the "No GP" group was significantly younger (mean 41 (SD 18)).

Follow-up telephone interviews were completed at 1 and 3 months in 260 (57%) and 247 (55%) participants, respectively. Most (n = 224, 73%) reported seeing a GP in the 3-month period (Table 2), including 48% (n = 20) of those initially allocated to the "no GP" group: a significantly lower proportion than the combined randomized groups with a GP on presentation ($P < .001$). There was no significant difference between the ASBI+GP and ASBI groups in the proportion visiting a GP or on other service use measures.

Alcohol consumption was similarly and significantly reduced in the "ASBI+GP" group at 1 ($P < .01$) and 3 months ($P < .001$) compared with baseline (Figure 2). The ASBI group demonstrated a significant reduction in alcohol consumption at 1 month ($P < .01$) but not at 3 months compared with baseline. Compared with baseline, there were no significant changes in alcohol consumption in the "no GP" group over the study period, despite having received the same ASBI program as the other 2 groups (Figure 2; Table 2).

In the longitudinal analysis (Table 3), for the alcohol measures there were main effects of sex (females had lower AUDIT-C scores and fewer standard drinks) and time (AUDIT-C scores and standard drinks declined from baseline to 1 and 3 months). However, neither of the critical group-by-time interactions were significant (AUDIT-C, Wald 0.71(4) $P = .950$: standard drinks, Wald 5.68(4) $P = .225$).

Overall, there were 1655 hospital events of which 408 (25%) were alcohol-related: 223 in the 6 months before and 185 in the 6 months after enrolment. These involved 21% of participants in the 6 months pre- and 13% in the 6 months post- their index event, including 3 people who had more than 10 alcohol events. Comparing outcomes between the ASBI+GP, ASBI and the "No GP" groups, the overall group-by-time interaction was not significant (Wald 5.09 (2) $P = .076$). However, the "No GP" group differed significantly from the ABSI+GP group with their rate increasing significantly with time (incident rate ratio (IRR) 1.68, 95%CI 1.06, 2.65; $P = .028$). Also, those in the high-risk AUDIT-C category at baseline had an increased rate of subsequent hospital alcohol-related events at 6 months (IRR 9.59, 95%CI 5.57, 16.52; $P < .001$).

Discussion

Managing alcohol use problems in the community is challenging and requires programs such as ASBI.[8] However, its utility in major hospitals and EDs has been unclear. Thus, we evaluated the impact of ASBI in an ESSU following presentation to ED and if those attending a GP had ongoing benefits from this intervention. In our study, participants were randomized to receive ASBI either with or without specific communication about the intervention to their usual GP following discharge from hospital. An additional group of participants who did not possess a GP also underwent ASBI. Alcohol consumption was significantly reduced in the ASBI groups at 1 month. This was sustained at 3 months in the ASBI+GP group who also had a referral letter sent to their GP at discharge. However, the ASBI group who did not have the specific referral letter sent, did not exhibit significantly reduced alcohol consumption compared with baseline after 3 months. The participants who had "no GP" continued with similar levels to baseline of alcohol consumption over the 3-month period following ASBI and discharge from hospital. After 6 months, the "no GP" group also demonstrated a significantly greater risk of alcohol-related events requiring readmission to hospital compared with the ASBI+GP group. Thus, failure to engage with a GP following discharge with an alcohol-related event is predictive of a high likelihood of representation.

Whilst sending a letter to a GP following administration of the ASBI did not improve outcomes over the 6-month period, the proportion of participants in the randomized groups who reported visiting a GP after discharge was nearly identical (76% *versus* 71%), indicating they probably received a similar intensity of hospital and GP-based care. The "No GP" group were significantly less likely to see a GP within 3 months and failed to demonstrate any reduction in alcohol consumption from baseline (Table 2; Figure 2). However, the wide variance in alcohol consumption meant that this was not statistically different to the randomized groups. The continuing high-level of alcohol consumption, even after a brief intervention for the "No GP" group, indicates that further efforts should be
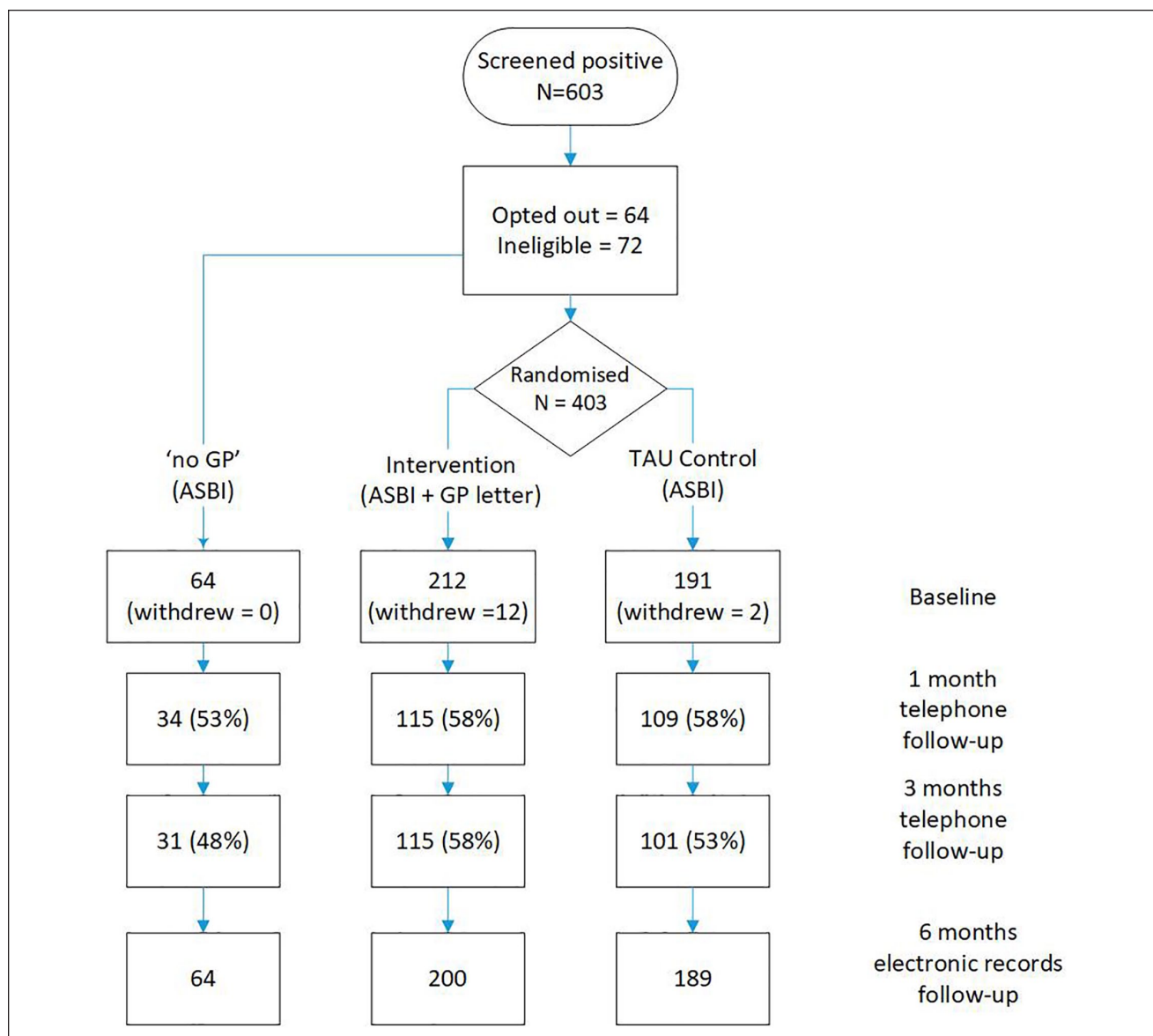
Figure 1. Participant recruitment and flow through study. ASBI = alcohol screening and brief intervention; GP = general practitioner; TAU = treatment as usual.

Table 1. Baseline Characteristics for the Randomized Participants (ASBI and ASBI+GP) and "No GP" Group.

Variable		ASBI+GP (n = 200)	ABSI (n = 189)	"No GP" (n = 64)	Test *P*-value[a]	Test *P*-value[b]
Gender	Male (%)	115 (58)	105 (56)	35 (55)	χ^2 .743	χ^2 .763
ATSI (yes)	n (%)	10 (5.0)	2 (2.1)	3 (4.7)	χ^2 .180	χ^2 .671
Age (years)	Mean (SD)	47 (19)	47 (18)	41 (18)	t .761	t .013
AUDIT-C	Moderate n (%)	114 (57)	110 (58)	34 (53)	χ^2 .811	χ^2 .504
	High n (%)	86 (43)	79 (42)	30 (47)		
AUDIT score	Mean (SD)	8.0 (2.8)	7.9 (2.8)	8.2 (2.6)	t .729	t .623
Drinks/week	Median (IQR)	19 (8-50)	21 (8-44)	20 (12-36)	U .689	U .692
Admitted to hospital (yes)	n (%)	20 (10.8)	18 (9.4)	8 (12.5)	χ^2 .742	χ^2 .503

Abbreviations: ATSI, aboriginal or Torres Strait islander; AUDIT-C, Alcohol use disorders identification test-consumption; IQR, interquartile range; SD, standard deviation.

[a]Note: the statistical tests compared the ASBI and ASBI+GP group.

[b]Note: the statistical tests compared the combined randomized groups and the "no GP" group.

Table 2. Self-Reported Alcohol Measures at 1 and 3 Months and Service Use by 3 Months for the Randomized (ASBI and ASBI+GP) Participants and the "No GP" Group.

Variable		ASBI+GP	ASBI	"No GP"	Test P-value[a]	Test P-value[b]
One month	Yes n (%)	115 (58)	109 (58)	34 (53)	χ^2 .973	χ^2 .504
AUDIT-C category	Low n (%)	37 (32)	32 (29)	11 (32)	χ^2 .752	χ^2 .628
	Moderate n (%)	47 (41)	50 (46)	12 (35)		
	High n (%)	31 (27)	27 (25)	11 (32)		
AUDIT-C score	Mean (SD)	5.7 (3.5)	5.6 (3.4)	6.2 (3.9)	t .789	t .348
Drinks/week	Median (IQR)	10 (4-27)	9 (5-24)	17 (7-40)	U .824	U .068
Three months	Yes n (%)	115 (58)	101 (53)	31 (48)	χ^2 .421	χ^2 .291
AUDIT-C category	Low n (%)	36 (32)	34 (34)	7 (22)	χ^2 .264	χ^2 .347
	Moderate n (%)	57 (50)	40 (39)	14 (46)		
	High n (%)	21 (18)	26 (26)	10 (32)		
AUDIT-C score	Mean (SD)	5.5 (3.4)	5.7 (3.8)	6.4 (4.0)	t .755	t .272
Drinks/week	Median (IQR)	8 (4-20)	11 (4-28)	24 (5-36)	U .397	U .210
Alcohol reduction >20%	n (%)	40 (63)	36 (64)	10 (56)	χ^2 .840	χ^2 .525
Three months service use	n (%)	145	133	43		
GP visit (yes)	n (%)	110 (76)	94 (71)	20 (48)	χ^2 .328	χ^2 <.001
GP visit alcohol-related	n (%)	39 (27)	28 (21)	8 (19)	χ^2 .255	χ^2 .428
Other health profession[c]	n (%)	28 (19)	18 (14)	10 (23)	χ^2 .195	χ^2 .250
Any external service use	n (%)	114 (79)	97 (73)	26 (61)	χ^2 .268	χ^2 .097

Abbreviations: AUDIT-C, alcohol use disorders identification test-consumption; ED, emergency department; GP, general practice; IQR, inter-quartile range; SD, standard deviation.
[a]Note: the statistical tests compared the ASBI and ASBI+GP groups.
[b]The statistical tests compared the combined randomized groups with the "no GP" group.
[c]Other health profession = detoxification service, psychologist, psychiatrist, other health professional.

undertaken to facilitate access to GP services for those individuals.

Despite recommendations,[9,10] ensuring that hospital staff are willing and able to prioritize ASBI remains a challenge. Prior to commencing the program, we interviewed individuals and ED staff about their attitudes to ASBI.[14] Overall, individuals were supportive of the approach. Most staff (68%) recognized ASBI as "important" or "very important" but only 42% "often" or "always" asked about alcohol use.[14] Staff education and resourcing is likely a critical component of any successful ASBI pathway.

While economic evaluation was not part for this study, the volume of alcohol-related events strongly supports the case for ASBI in the emergency setting.[15] Our at-risk cohort placed substantial demand on hospital resources, with 1655 hospital events, including 408 alcohol-presentations. As the cohort all had "at-risk" alcohol use, it is predictable that the proportion of alcohol-related events (25%) was higher than the 10% typically reported for ED[3] and is consistent with high-risk alcohol users having an increased rate of hospital admissions.[16]

Limitations of our study include a high-level of attrition with telephone follow-up and the self-reported nature of alcohol consumption and GP access data: as such the study would have had a low power to detect changes in alcohol measures. However, the use of electronic records to assess
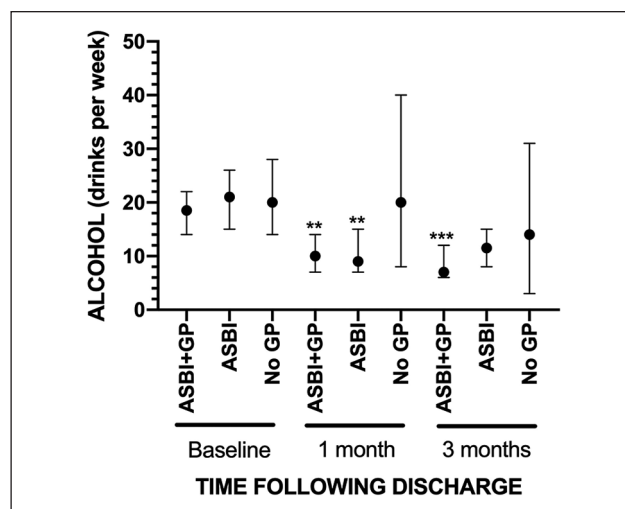
Figure 2. Alcohol consumption (drinks per week) in the ASBI+GP, ASBI and "no GP" groups at baseline, 1 month and 3 months following discharge from hospital. Data are presented as the median and 95% confidence intervals. **$P < .01$, ***$P < .001$ Kruskal–Wallis test (multiple comparisons) compared with same group at baseline. ASBI = alcohol screening and brief intervention; GP = general practitioner.

hospital utilisation mitigates the issue of attrition and ensures that measure was suitably powered. Further, by

Table 3. Baseline to 3-Months Change for the Individual Randomized Groups and the "No GP" Group for (a) AUDIT-C scores, (b) 7-day drinking scores and (c) Hospital Events 6-Months Pre- and Post- Index Admission to Hospital ED.

Variable		Wald	DF	P-value	OR	95% CI OR	
(a) AUDIT-C score (baseline to 3 months)							
Group	No GP	0.109	1	.741	1.133	0.540	2.378
	ASBI	0.046	1	.830	1.061	0.619	1.819
ASBI+GP (reference)							
Sex	Female	23.71	1	<.001	0.275	0.164	0.463
	Male (reference)						
Time	Month 3	43.426	1	<.001	0.102	0.052	0.201
	Month 1	52.403	1	<.001	0.104	0.056	0.192
Baseline (reference)							
Age (years)		15.924	1	<.001	0.975	0.963	0.987
Interaction group × time†		0.713	4	0.950			
(b) Standard drinks (LN 10 transformed) (baseline to 3 months)							
Group	No GP	000	1	.999	1.000	0.870	1.150
	ASBI	0.208	1	.648	0.975	0.874	1.087
ASBI+GP (reference)							
Sex	Female	23.051	1	<.001	0.790	0.718	0.870
	Male (reference)						
Time	Month 3	19.464	1	<.001	0.764	0.678	0.861
	Month 1	21.449	1	<.001	0.752	0.667	0.849
Baseline (reference)							
Age (years)		1.330	1	.249	0.999	0.996	1.001
Interaction Group × time †		5.676	4	.225			
(c) Alcohol-related hospital events (6 months pre–post)							
Group	No GP	1.328	1	.249	0.719	0.410	1.260
	ASBI	0.755	1	.385	0.831	0.547	1.262
ASBI+GP (reference)							
Sex	Female	0.473	1	.492	0.901	0.669	1.213
	Male (reference)						
Time	Post	0.154	1	.694	0.938	0.680	1.293
	Pre (reference)						
AUDIT-C	High-risk	66.464	1	<.001	9.592	5.570	16.519
Moderate-risk (reference)							
Age (years)		0.004	1	.948	1.000	0.991	1.008
Interaction Group × time (ASBI+GP vs no GP)		4.837	1	.028	1.675	1.058	2.653

Abbreviations: ASBI, alcohol screening and brief intervention; ASBI+GP, alcohol screening and brief intervention + GP referral letter; AUDIT-C, alcohol use disorders identification test-consumption; "No GP", no GP named at baseline (not randomized).
†Omnibus test of interaction.

recruiting participants in the ESSU, the sample is likely to differ from the broader ED population. The ESSU is designed and designated for the short-term treatment or observation, assessment and reassessment of patients following triage and assessment in the ED for up to 24 hours.

We did not provide any support or additional training to GP in addressing at-risk alcohol use, so some may have lacked confidence or skills in delivering appropriate interventions in addition to the logistics of incorporating these within tight appointment schedules. It is accepted that counseling patients on risky alcohol use or addiction can be a complex and lengthy process, but GPs are often well-placed to steer the patients toward other forms of community-based specialist input and support. Nevertheless, it has been

noted that investigations of ASBI in "real world" settings report smaller on non-significant effects compared with efficacy trials.[6] Future studies examining the benefits of this approach to GPs in highlighting risky alcohol use and its management would clarify this issue. Finally, this study did not investigate injuries caused by other alcohol-affected people: nearly 20% of alcohol-related events may be caused by third-parties, so the overall impact of alcohol use on hospital services will be underestimated.[17]

Conclusions

We conclude that for ASBI to have beneficial effects on at-risk alcohol consumption and readmission to hospital with

alcohol-related events, individuals must engage effectively with a GP following discharge from hospital.

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Ethical Approval

The research was conducted according to the World Medical Association Declaration of Helsinki. The South Metropolitan Health Service Human Research Ethics Committee approved the study (RGS0377).

Supplemental Material

Supplemental material for this article is available online.

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