Effectiveness and cost-effectiveness of alcohol brief interventions for high-risk adolescents attending Emergency Departments (SIPS Junior High Risk Trial)

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Effectiveness and cost-effectiveness of face-to-face and electronic brief interventions versus screening alone to reduce alcohol consumption among high-risk adolescents presenting to Emergency Departments: three-arm pragmatic randomised trial (SIPS Junior High Risk Trial)

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Background

Alcohol consumption in adolescence

1. The main burden of chronic alcohol-related disease is in adults, its foundations often lie in adolescence
2. The proportion of young people in England aged between 11-15 years who reported that they have drunk alcohol decreased in the last 30 years.
3. The mean amount consumed by those who drank doubled (from 6 to 12u/week).
4. Alcohol consumption and related harm increase steeply from the age of 12
5. There are about 15.5 million attendances to emergency departments in England and of these, **2.0 million (13.4%) are by patients aged 10-19 years**
6. A conservative estimate would suggest that 500,000 hazardous drinkers under the age of 18 years are seen in the ED – is this another missed opportunity?

SIPS jr: Research Programme

1. To examine the **prevalence** of alcohol consumption among adolescents (aged 10-17 years) presenting to hospital emergency departments in England
2. To determine the association between **alcohol consumption** and age of onset of alcohol consumption with health and social **consequences**, among adolescents presenting at EDs in England
3. To estimate and compare the sensitivity, specificity, and diagnostic odds ratios of the **AUDIT and AUDIT-C** in identifying **at-risk alcohol use**, monthly heavy episodic alcohol use, alcohol abuse and alcohol dependence in the context of an opportunistic screening programme for adolescents attending EDs in England

Demographics and alcohol consumption – Prevalence study

1. 5377 consented to participate across the 10 EDs in a 6-month period
2. The mean age was 13.3 (SD 2.1) years with similar proportions of male (53.7%) and female (46.3%)
3. **2112 (39.3%) had consumed alcohol at some time in the past and 1378 (25.6%) had consumed alcohol in the past 3 months.**
4. Those who had consumed alcohol tended to be older (14.8 versus 12.3 years) and were more likely to be white (83.4 versus 65.6%).
5. The average age of first alcoholic drink was 12.9, ranging from 5 to 17 years of age (17 was the upper limit for inclusion in this study).
6. **The prevalence of at-risk drinking was 14.8%** (95% CI: 13.9–15.8%),
7. of monthly heavy episodic alcohol use was 10.6% (9.8–11.4%),
8. alcohol abuse 2.4% (2.0–2.8%)
9. alcohol dependence 1.2% (0.9–1.5%).

Last 3 month drinking (by age)

Age	Recruited	Had alcohol 3 M	%
10	567	7	1.2
11	697	19	2.7
12	801	54	6.7
13	843	119	14.1
14	750	231	30.8
15	778	337	43.3
16	533	320	60.0
17	380	291	76.6
Total	5349	1378	

Optimal Screening cut off score

Screening properties of the AUDIT-C and 10-item AUDIT questionnaires were tested against the gold standard criteria for at-risk drinking, heavy episodic alcohol consumption, alcohol abuse and alcohol dependence, and appropriate cut-points were identified for each instrument:

1. The optimum cut-off point for **AUDIT** in identifying either **at-risk drinking**, **monthly heavy episodic** drinking or **alcohol abuse** was **4 or more**, this provided the optimal cut-point to provide acceptable sensitivity, specificity and diagnostic odds.
2. An **AUDIT-C score of 3** or more demonstrated almost identical diagnostic properties but with a significantly better sensitivity for **at-risk drinking**.
3. An **AUDIT score of 7** or more provided a significantly more effective cut-point for **alcohol dependence** than any other cut-off point, and demonstrated significantly better diagnostic properties than an AUDIT-C score of 5 or more.

Methods

SIPS jr – Randomised trials, design

- Two linked randomised trials to evaluate the effectiveness and cost-effectiveness of two intervention strategies (**PFBA & eBI**) compared with **screening alone (SA)**.
- Patient and Public Involvement (PPI)
- One trial focuses on **high-risk** adolescent drinkers and the other on those identified as **low-risk** drinkers or abstinent from alcohol.
- Target 1500 young people aged **14-17** years presenting to EDs
- 6 and 12 M follow-ups
- **Primary outcome** measure is quantity of **alcohol consumed at 12 months** after randomisation as measured by AUDIT C

Methods

- 7,854 ED attenders (aged 14 to 17) over 6 months - 7 day/week 10am-10pm

- 5,016 (64%) Approached & Assessed

- 3,327 (66%) Consented to screen for alcohol consumption

- 1,640 randomised into the trials.

- **756 high-risk drinkers (AUDIT- C >= 3)**

- 884 low-risk drinkers or abstainers (1/3)

- SIPS Street app installed (whenever possible) in ED

- **82.9%** across the two trials were follow up at 6 months.

- **73%** across the two trials were follow up at 12 months.

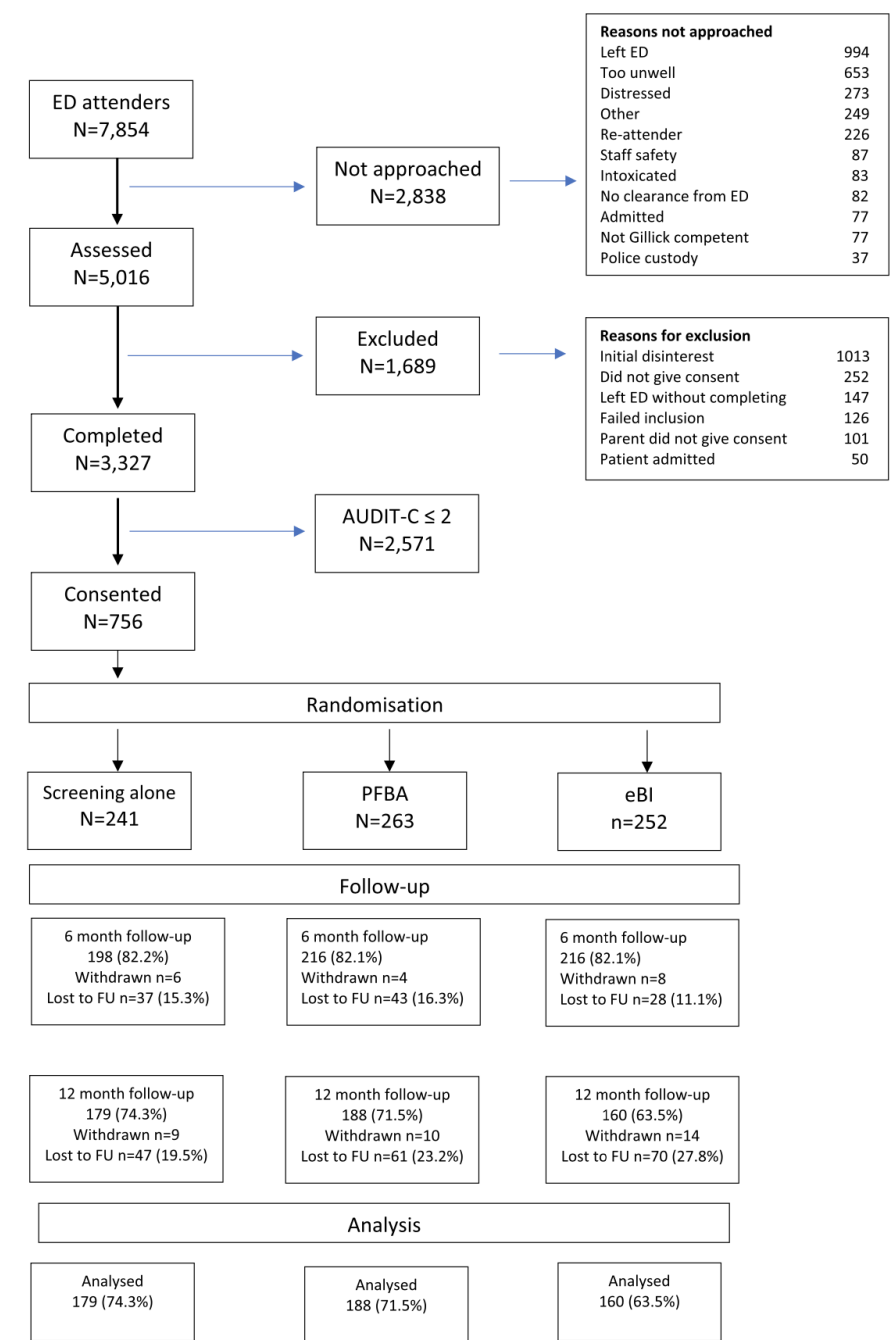- Screened and recruited using an ad-hoc ipad app

Reasons not approached

Left ED	994
Too unwell	653
Distressed	273
Other	249
Re-attender	226
Staff safety	87
Intoxicated	83
No clearance from ED	82
Admitted	77
Not Gillick competent	77
Police custody	37

Reasons for exclusion

Initial disinterest	1013
Did not give consent	252
Left ED without completing	147
Failed inclusion	126
Parent did not give consent	101
Patient admitted	50

ED attenders N=7,854 → Not approached N=2,838

Assessed N=5,016 → Excluded N=1,689

Completed N=3,327 → AUDIT-C ≤ 2 N=2,571

Consented N=756

Randomisation

| Screening alone N=241 | PFBA N=263 | eBI n=252 |

Follow-up

| 6 month follow-up 198 (82.2%) Withdrawn n=6 Lost to FU n=37 (15.3%) | 6 month follow-up 216 (82.1%) Withdrawn n=4 Lost to FU n=43 (16.3%) | 6 month follow-up 216 (82.1%) Withdrawn n=8 Lost to FU n=28 (11.1%) |

| 12 month follow-up 179 (74.3%) Withdrawn n=9 Lost to FU n=47 (19.5%) | 12 month follow-up 188 (71.5%) Withdrawn n=10 Lost to FU n=61 (23.2%) | 12 month follow-up 160 (63.5%) Withdrawn n=14 Lost to FU n=70 (27.8%) |

Analysis

| Analysed 179 (74.3%) | Analysed 188 (71.5%) | Analysed 160 (63.5%) |

FIGURE 1 Consort diagram showing actual recruitment and intervention. ED = emergency department; FU = follow-up; PFBA = personalized feedback and brief advice

Electronic data collection

Interventions

Trial arm components

TABLE 1 Summary of trial arm components

Component	Screening alone (SA)	Personalized feedback and brief advice (PFBA)	Personalized feedback and electronic brief intervention (eBI)
Rational, theory or goal	Control condition	Brief advice to achieve abstinence or low-level consumption	Brief advice delivered via interactive electronic app. to achieve abstinence or low-level consumption
Materials	None	Healthy Lifestyle leaflet	Healthy Lifestyle leaflet and smartphone app.
Procedure	Screening only using AUDIT-C	Personalized feedback on alcohol screening, and brief advice and discussion of alcohol use, covering feedback of screening result, recommended consumption levels, normalized consumption for age, strategies to achieve abstinence or low-level drinking and sources of additional support	In addition to personalized feedback on their alcohol screening participants were introduced to a smartphone or PC-based app. designed to help achieve abstinence or low-level consumption. The app. centred around a city with a specific building where advice could be sought. Participants could create drinking diaries, create goals, receive personalized feedback and seek advice regarding risks associated with alcohol use
Interventionist	ED nurse or researcher	ED nurse or researcher	ED nurse or researcher, app. was self-directed
Delivery mode	Screening tool self-completed on iPAD	Face-to-face discussion	Interaction with app. was self-directed
Location	Emergency department	Emergency department	Personalized feedback and initial introduction to the app was in the emergency department, interaction with the app. was at the participant's discretion
Session duration and frequency	1 minute, one occasion	Up to 5 minutes, one occasion	Personalized feedback and introduction to app. up to 20 minutes on one occasion. Interaction with the app. was not limited in terms of duration or frequency

ED = emergency department; AUDIT-C = Alcohol Use Disorders Identification Test: consumption; app. = application.

SIPS junior

Young People and alcohol

KNOW YOUR UNITS

BEER 1 PINT 4.4% (2.5 UNITS)	ALCOPOP 275ML 5% (1.4 UNITS)	SHOT 25ML 40% (1 UNIT)	GLASS OF WINE 175ML 12% (2 UNITS)	BOTTLE OF WINE 750ML 12% (9 UNITS)
BOTTLE OF VODKA 1 LITRE 40% (40 UNITS)	CHEAP WINE 1 LITRE 5% (5 UNITS)	SHOT 35ML 40% (1.4 UNITS)	BOTTLE OF VODKA 500ML 12% (20 UNITS)	CIDER 1 PINT 5.2% (3 UNITS)

The UK government recommend that an alcohol free childhood is the healthiest and best option

What is 'At Risk Drinking'?

- You may have been told that you are an 'At Risk Drinker' this can mean that you are currently or recently have been drinking alcohol in a way that may increase your risk of problems.

- You might have used alcohol in large amounts or drank alcohol regularly enough to put you at risk of harms.

- It is advised that young people under 15 shouldn't drink alcohol. There is clear evidence that that alcohol **can harm the developing brain, bones and hormones**.

- Drinking at age 15 can be hazardous to health. Binge drinking and heavy alcohol use puts young people at risk – from **injuries, fights, regretted sexual activity** and other **substance misuse**.

- It is advised that if you are pregnant you shouldn't drink alcohol as it can effect the unborn baby.

Why do young people drink?

- For enjoyment
- To get drunk
- Make a party more enjoyable
- Because their friends do
- To celebrate
- To fit in
- To have fun
- To cope with feelings

How common is 'At Risk Drinking' for young people that attend A&E?
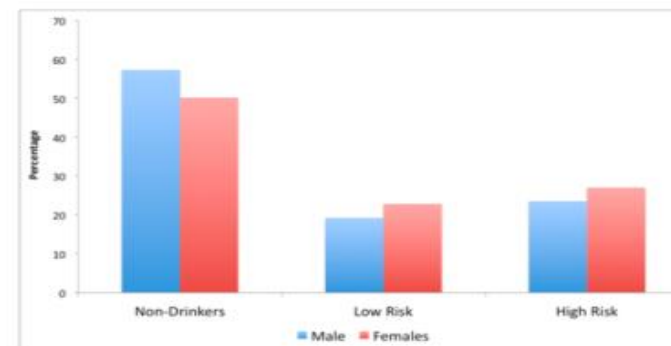
Aged 14: 1 in 10 are at risk drinkers

Aged 15: 1 in 5 are at risk drinkers

Aged 16: Over a third are at risk drinkers

Aged 17: Over half are at risk drinkers

What are the benefits of *cutting down* your alcohol use?

- ✓ No hangovers
- ✓ More energy
- ✓ Able to concentrate more
- ✓ Better mood
- ✓ Better sleep
- ✓ Lose weight
- ✓ Less accidents
- ✓ Less risky situations
- ✓ Better relationships
- ✓ Save money
- ✓ Reduce risk of long term health problems

Set yourself realistic goals to reduce risks related to your drinking.

- If you are a young person drinking alcohol at levels that may cause harm it is advised that you aim to stop drinking altogether
- If you choose not to stop drinking it is advised that reducing your level and times you drink is better than continuing at your current level.
- If you are age under 15 years there is no safe level of drinking

You may wish to use the following;

- Plan to be busy at times when you normally drink
- Limit or avoid the time spent with drinking friends
- Avoid situations which put you at risk of drinking
- Develop other interests such as; cinema, sports, gaming, etc
- Spend time with friends who don't drink alcohol, doing something you enjoy

FURTHER INFORMATION ABOUT ALCOHOL

The effects of alcohol intoxication
As alcohol levels in the body increase there are changes to how a person thinks and feels:

- Do things you later regret
- Increased risk of accidents
- Feeling of being drunk instead of relaxed
- Getting into rows, arguments, fights
- Slurring your words when you talk
- Not able to remember things properly
- Large amounts of alcohol can cause alcohol poisoning which is a dangerous condition that can kill you.

What is alcohol poisoning?
Large amounts of alcohol overwhelm the organs and systems of the body and stop them from working properly. The signs of alcohol poisoning include:

- Person is confused/not able to wake up
- Vomiting - which can cause choking
- Slow breathing (very few breaths per min)
- Breathing is not normal – long gaps
- Low body temperature - skin appears quite blue, pale
- Person may have a seizure/fit

What should you do if you suspect someone has alcohol poisoning?
Do: Know the signs of alcohol poisoning
Do: Be aware the person who has passed out might die
Do: Call for help, phone 999
Do: Contact an adult
Do: Stay with them until someone arrives
Do: Try to keep the person awake and warm
Don't: Wait for someone to have all the signs of alcohol poisoning before you act
Don't: Leave them to sleep off alcohol
Don't: Let the person drink any more alcohol

Alcohol and young people - the law

Under 18 years:
If you're under 18 and drinking alcohol in public, you can be stopped, fined or arrested by police.
If you're under 18, it is against the law:

- for someone to sell you alcohol
- to buy or try to buy alcohol
- for an adult to buy or try to buy alcohol for you
- to drink alcohol in a pub/restaurant

16-17 years
If you're 16 or 17 and with an adult, you can drink beer, wine or cider with a meal. But you cannot buy alcohol.
It's illegal to give alcohol to children under 5.

16 years or under:
You *may* be able to go to a pub if you're with an adult. Each pub, restaurant, etc has rules about young people so some pubs may allow this and others not.

For further information and advice about drinking

Talk to FRANK www.talktofrank.com
Speak to Drinkline: 0800 917 8282

For local support, contact:

Label/sticker

Figure 1 - An example of interaction with a character resulting in coin collection

Figure 2 – An example of the drinking chart made when participants entered their alcohol consumption

Results

Baseline results

TABLE 2 Demographic and baseline characteristics by allocated group

	Screening alone (SA) (*n* = 241)	PFBA (*n* = 263)	eBI (*n* = 252)
Mean age in years (SD)	16.1 (0.9)	16.0 (0.9)	16.1 (0.9)
Mean age of first drink (SD)	13.4 (2.1)	13.7 (1.7)	13.3 (2.2)
Male *n* (%)	125 (51.9)	127 (48.3)	124 (49.2)
Ethnicity			
White: *n* (%)	207 (85.9)	223 (84.8)	211 (84.1)
Black: *n* (%)	9 (3.7)	14 (5.3)	15 (5.9)
Asian: *n* (%)	3 (1.2)	5 (1.9)	1 (0.3)
Other: *n* (%)	22 (9.2)	21 (8.0)	24 (9.7)
Smoker: *n* (%)	97 (40.3)	95 (36.1)	96 (38.2)
Alcohol use			
Mean weekly alcohol consumption (SD)[a]	5.01 (7.82)	4.33 (8.96)	4.55 (7.43)
Mean AUDIT-C score (SD)	4.86 (1.80)	4.77 (1.93)	4.87 (1.88)
Heavy alcohol use at least monthly: *n* (%)[b]	91 (37.8)	91 (34.6)	106 (42.1)
Ever intoxicated: *n* (%)[c]	194 (80.7)	211 (80.2)	208 (82.5)
Intoxicated in past 12 months: *n* (%)[c]	170 (70.6)	186 (70.9)	182 (72.4)
Intoxicated in past 30 days: *n* (%)[c]	76 (31.4)	81 (30.7)	69 (27.2)

Follow-up results

TABLE 3 Adjusted outcome means and 95% confidence intervals at 6 and 12 months by allocated group: complete case analysis

	Screening alone SA (n = 179)	PFBA (n = 188)	eBI (n = 160)
Alcohol use			
Weekly alcohol consumption[a]			
Month 6	2.42 (1.84; 3.11)	2.13 (1.62; 2.74)	2.33 (1.77; 3.00)
Month 12	2.99 (2.38; 3.70)	3.56 (2.90; 4.32)	3.18 (2.50; 3.97)
AUDIT-C score			
Month 6	4.64 (4.17; 5.11)	4.30 (3.85; 4.75)	4.64 (4.18; 5.11)
Month 12	5.04 (4.65; 5.44)	5.25 (4.87; 5.63)	5.12 (4.70; 5.54)
Strengths and difficulties (12 months only)			
Total score	11.0 (10.2; 11.7)	10.9 (10.2; 11.6)	10.9 (10.1; 11.6)
Emotional symptom score	3.14 (2.82; 3.46)	3.23 (2.91; 3.54)	3.09 (2.75; 3.43)
Conduct problem score	1.90 (1.70; 2.10)	1.74 (1.55; 1.94)	1.86 (1.65; 2.07)
Hyperactivity score	3.54 (3.23; 3.84)	3.73 (3.43; 4.02)	3.87 (3.55; 4.19)
Peer problem score	2.30 (2.06; 2.54)	2.21 (1.97; 2.44)	2.05 (1.80; 2.30)
Prosocial behaviour score	7.91 (7.66; 8.16)	8.21 (7.97; 8.45)	7.75 (7.49; 8.01)

[a]Measured in standard units of alcohol (equal to 8 g ethanol). PFBA = personalized feedback and brief advice; eBI = electronic brief intervention; AUDIT-C = Alcohol Use Disorders Identification Test: consumption.
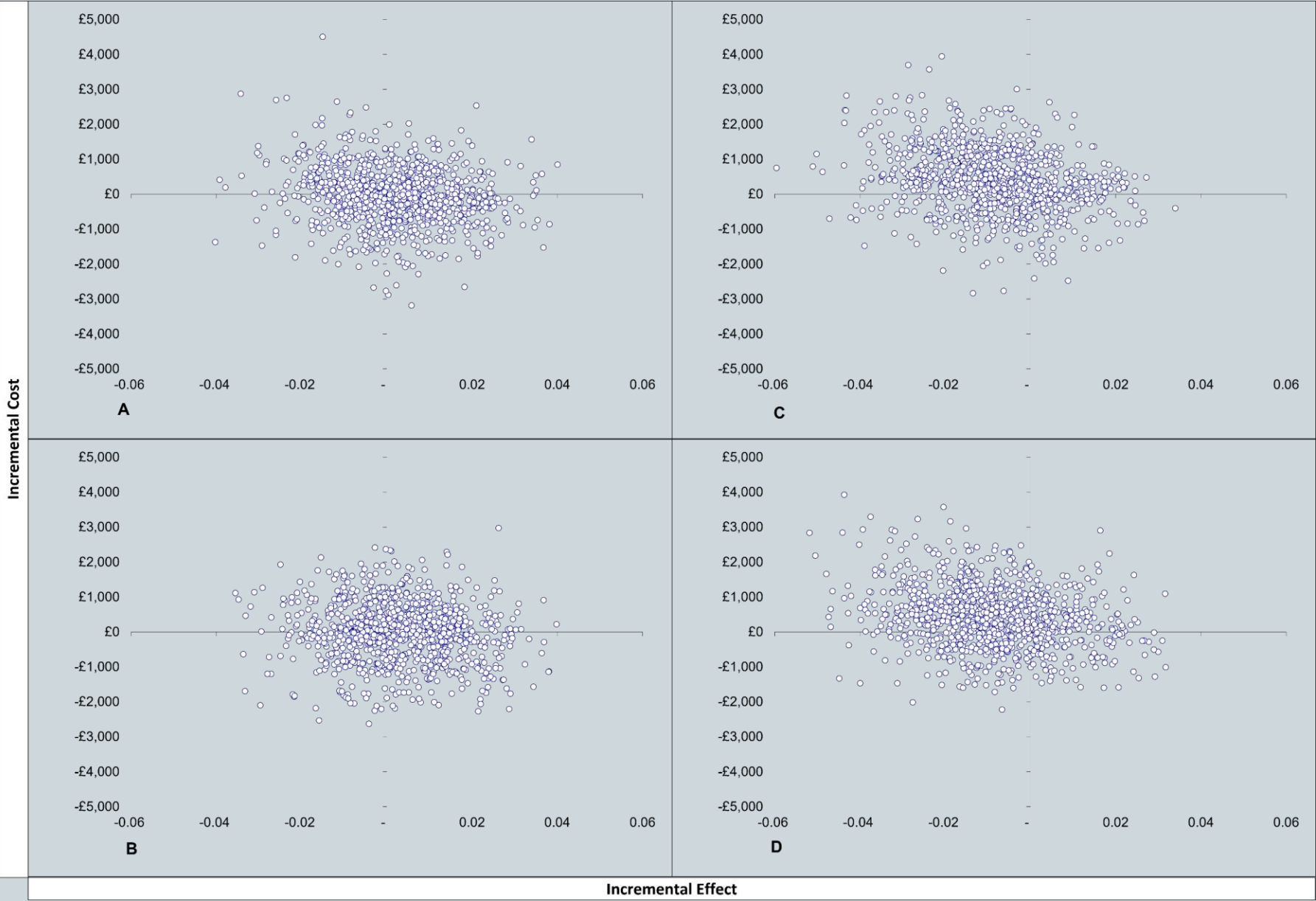
Cost-effectiveness plane

PFBA   eBI

NHS/Social services

Societal

Engagement with SIPS intervention app (eBI)

1. 250/547 **(46%)** in both eBI arms downloaded the app
2. Only 84 **(33%)** of high-risk and 103 (35%) of low-risk **interacted with the app** (at least once)
3. For both groups, **no relationship** was observed between **app interaction and alcohol consumption** at month 12.

4. The mean number of coins collected by each participant was 2.43 (SD 5.06).
5. Almost 50% of participants collected 0 coins and one participant collected the maximum of **27 coins**.
6. All participants who collected more than 11 coins were female.
7. On average, participants undertook 1.62 (SD 2.04) sessions on the app. Each session lasted 257 seconds on average (4.28 minutes).
8. The maximum number of sessions completed by one participant was 15.
9. The mean number of building visited on the app was 15.7 (SD 29.2) with a quarter of participants only visiting the 'Home' building.
10. On average, participants interacted with 4 characters on the app, with 96 (38%) of participants interacting with no characters.

Conclusions

1. Over 8,500 patients screened, over 1500 recruited in RCT, 83/73 FU
2. The prevalence of at-risk drinking was 14.8% (10-17)
3. AUDIT-C score of 3 or more best to identify at-risk drinking
4. Early onset of drinking was associated with health and social problems

1. **PFBA and eBI are no more effective nor cost effective in reducing alcohol consumption in low- and high-risk drinkers than screening alone.**
2. In both trials we found that engagement with the eBI intervention was low in participants randomized to eBI.
3. Only a third of participants engaged with the eBI platform after leaving ED. This may have limited the impact of the eBI intervention compared to control intervention.
4. However, as these were pragmatic trials, this is likely to be the level of engagement expected in the typical patient recruited for ED.

Thank you

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