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Effectiveness of a Specialized Brief Intervention for At-risk Drinkers in an Emergency Department: Short-term Results of a Randomized Controlled Trial

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ABSTRACT

Background: Screening, Brief Intervention, and Referral to Treatment (SBIRT) programs have been developed, evaluated, and shown to be effective, particularly in primary care and general practice. Nevertheless, effectiveness of SBIRT in emergency departments (EDs) has not been clearly established.

Objective: We aimed to evaluate the feasibility and efficacy of an SBIRT program conducted by highly specialized professionals in the ED of a tertiary hospital.

Methods: We conducted a randomized controlled trial to study the feasibility and efficacy of an SBIRT program conducted by alcohol specialists for at-risk drinkers presenting to the ED, measured with the three-item version of the Alcohol Use Disorder Identification Test (AUDIT-C). Patients were randomized to two groups, with the control group receiving two leaflets—one regarding alcohol use and the other giving information about the study protocol. The intervention group received the same leaflets as well as a brief motivational intervention on alcohol use and, where appropriate, a referral to specialized treatment. The primary outcomes were the proportion of at-risk alcohol use measured by AUDIT-C scale and the proportion of patients attending specialized treatment at 1.5 months.

Results: Of 3,027 patients presenting to the ED, 2,044 (67%) were potentially eligible to participate, 247 (12%) screened positive for at-risk drinking, and 200 agreed to participate. Seventy-two percent of the participating sample were men, and the mean (±SD) age was 43 (±16.7) years. Follow-up rates were 76.5%. At 1.5 months, the intervention group showed greater reductions in alcohol consumption and fewer patients continuing with at-risk alcohol use (27.8% vs. 48.1%; p = 0.01). The SBIRT program also increased the probability of attending specialized treatment, compared to the control condition (23% vs. 9.8%, p = 0.0119)

Conclusion: The SBIRT program in the ED was found to be feasible and effective in identifying at-risk drinkers, reducing at-risk alcohol use, and increasing treatment for alcohol problems.

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Alcohol use and its consequences represent an important public health problem as it is one of the most important risk factors for premature death and disability worldwide[1,2] and also adds a heavy economic burden to societies.[3] As well as full-blown alcohol dependence, hazardous and harmful drinking also contribute to this high burden in terms of morbidity and mortality.[4] Importantly, and partially explaining this high burden of disease, the treatment rate for alcohol-related disorders is low, similar to other mental health disorders.[5] In Europe, only one in every 10 patients with alcohol use disorder requests treatment and usually after 10 years of delay.[6–8] To improve these patients' prognosis and decrease associated social and health care costs, strategies to increase early detection and interventions to reduce alcohol use and prevent related problems are needed.[9] For these reasons, Screening, Brief Intervention, and Referral to Treatment (SBIRT) programs have been developed, evaluated, and shown to be effective, particularly in primary care practice.[10–12]

In trying to expand the concepts of SBIRT to other settings, the emergency department (ED) has received a great deal of attention, particularly because alcohol consumption is associated with a decrease in primary care services utilization;[13,14] thus EDs are a primary gateway to health care services.[15] Given this, EDs offer a window of opportunity to address alcohol problems. Nevertheless, despite several studies published, effectiveness of BIs in the ED has not been clearly established. A closer look at the existing body of evidence reveals mixed results. Many studies did not find statistically significant differences and are misunderstood as evidence of absence of effect.[16,17] In fact, alternative hypotheses suggest an absence of evidence due to statistical factors and methodologic difficulties.[18] At the same time, there are large methodologic differences between trials, which make reaching general conclusions difficult. First, target populations have not been clearly identified and admissions criteria range from all injured patients to those presenting to the ED with alcohol-related conditions to all patients presenting to the ED, while consumption ranges from alcohol dependent to at-risk drinkers. Second, and probably more relevant, studies vary in who provides the intervention. In many clinical trials intervention is provided by research assistants with no clinical background, trained for the purpose study. In others, intervention is provided by ED staff with no or little background training in alcohol use disorders. The aim of our study was to implement and evaluate an SBIRT program for at-risk drinkers, in the ED of a tertiary hospital, with the intervention, conducted by psychiatrists highly specialized in addictive disorders and motivational techniques.

METHODS

Study Design

We conducted an open randomized controlled trial in the ED of a tertiary hospital to evaluate the feasibility and effectiveness of an SBIRT program for at-risk drinkers to reduce alcohol use and increase access to treatment. Ethical approval was granted by the Ethics Committee of Hospital Clínic of Barcelona. The clinical trial was registered on ClinicalTrials.gov (ID NCT03273283). Our main objectives are to demonstrate that SBIRT program is effective to reduce at-risk alcohol use and to increase access to specialized treatment.

Selection of Participants

All patients aged 18 or older presenting to the ED were potentially eligible patients. Those with cognitive impairment or who were medically unstable were excluded. Patients explicitly demanding alcohol treatment during their attendance were also excluded. All patients in the ED during time frames when research staff were available including morning and afternoon hours were consecutively screened using the three-item version of the Alcohol Use Disorder Identification Test (AUDIT-C) by three psychiatrists from the addictions unit of the same hospital. Patients scoring more than 6 points for men and more than 5 for woman were invited to participate. Cutoff points were raised for two reasons: first, to increase the specificity of the test, and second, because evidence suggests that patients with higher AUDIT-C scores benefit more from SBIRT programs.[19] Screening was performed during the stay in the ED. Patients who gave informed written consent were randomized into the study groups.

Randomization Procedures

Simple randomization was chosen.[20] Prior to the study initiation a list of 250 participant numbers was randomized into two groups (intervention group or control group). To guard against bias, the enrollment packs for each group were the same size and thickness and without external indicators of the group.

Procedures

After the consent form was signed, the control group received two leaflets: one about alcohol use with a list of treatment resources including contact details and the other providing information about the study protocol. The intervention group patients received the same leaflets, but were also included on an SBIRT program consisting of a BI and referral to treatment if needed. Intervention was provided in the same emergency ward by the same psychiatrists who performed the screening. These professionals are specialized in addictive disorders and highly trained in motivational interviewing techniques. In Spain, differently from other countries, most alcohol specialists are psychiatrists.

Intervention

The intervention was based on motivational techniques and lasted from 5 to 15 minutes, depending on patient response and characteristics.[21] The aims of the intervention were to inform targeted patients about alcohol-related harms, to raise patients' awareness about their alcohol intake and possible consequences, to enhance motivation and induce a state of change about alcohol use, and finally to give patients strategies to reduce alcohol use and further treatment options. We began asking about patients' thoughts on their own alcohol consumption and its consequences. Subsequently, and only with the patients' verbal consent, patients were given feedback on the AUDIT-C results and informed about possible consequences of their alcohol use. At that point, the professionals encouraged the patients to talk about their goals and aims regarding alcohol use. Finally, strategies to reduce alcohol use were offered, and those patients willing to undergo treatment were given an appointment in less than 1 week, before discharge.

Measures

Age, sex, and previous diagnosis of alcohol use disorder and/or other substances were recorded at baseline, based on clinical records. Those who presented to the ED with reasons directly related with alcohol use were coded as "Alcohol-related presenting condition." The main alcohol-related conditions were alcohol intoxication, withdrawal symptoms, alcoholic liver disease, and behavioral disturbances under the effects of alcohol.

At 6 weeks, the primary outcomes of the study were the proportion of at-risk drinkers (measured with AUDIT-C scale; patients scoring more than 6 points for men and more than 5 for woman) in each group and the proportion of patients who attend to specialized treatment following ED attendance. Patients received a phone call at 6 weeks and were reassessed using the AUDIT-C and asked if they had attended to specialized treatment. As a secondary outcome, we also used the reduction in AUDIT-C score at 6 weeks compared to first assessment.

Sample Size and Data Analysis

The required sample size was calculated with 95% confidence and 80% power to detect a difference between groups of a 15% reduction of risky drinkers. With an estimated attrition rate of 30%, 223 patients in total were required. Although it was not possible to reach expected sample size, recruitment procedure ended after 4 months, as the screener's contract ran out.

Statistical analyses were conducted using SPSS v23. At baseline, participants' demographic and enrollment-related characteristics were compared across treatment conditions using t- and chi-square tests according to the nature of each variable. The main outcome of the study was assessed using logistic regression models with all available variables as independent parameters (age, sex, alcohol-related presenting condition, alcohol use disorder or other substance use disorder previously diagnosed, AUDIT-C total score at baseline). We also performed linear regression analysis to test global reductions in the AUDIT scores according to treatment condition. All statistical procedures were performed according to intention-to-treat analysis.

RESULTS

Figure 1 shows patients' flow through the trial. The most frequent exclusion criteria was living outside the Barcelona metropolitan region. A total of 72% were men, and the mean (±SD) age was 43 (±16.7) years. Baseline characteristics of each group are shown in Table 1.

The 6-week follow-up was completed for 153 patients through phone interviews, representing a global follow-up rate of 76%. The follow-up rate of the control group was higher, but not significantly, compared to intervention group (80.1% vs. 72.7%, $p = 0.21$). Three patients died during this period—two in the intervention group and one in the control group—for reasons not related to the intervention or study protocol.

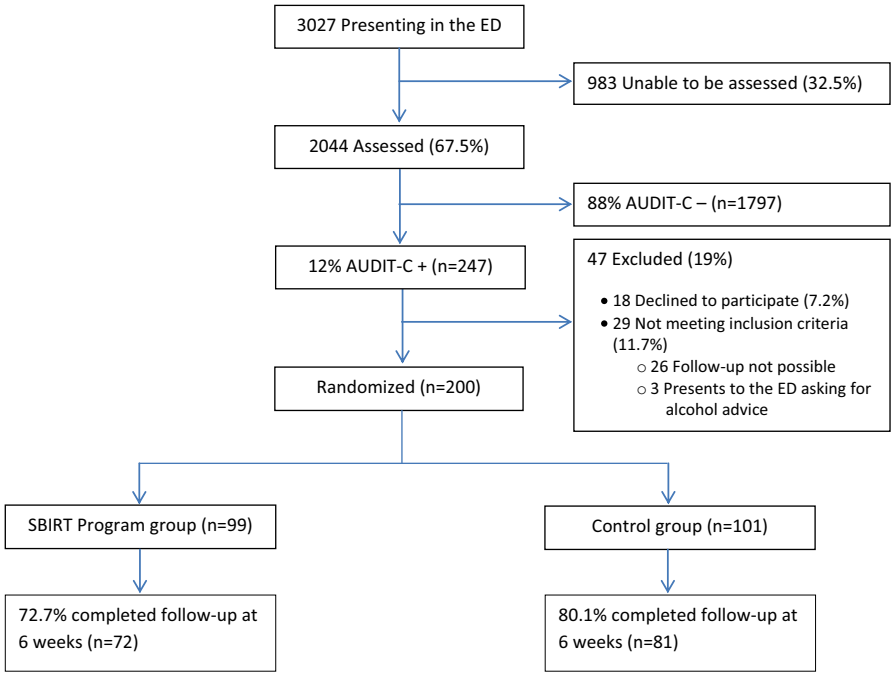

Figure 1. CONSORT flow diagram. AUDIT-C = three-item version of the Alcohol Use Disorder Identification Test; SBIRT = Screening, Brief Intervention, and Referral to Treatment.

Table 1
Baseline Characteristics

	Group	
	Control (*n* = 101)	Intervention (*n* = 99)
Mean (years)	41.6 (±16.2)	44 (±17.1)
Male sex	73 (72.3, 64.1–81.2))	71 (71.7, 62.6–81)
Alcohol-related presenting condition	11 (10.9, 5.6–17.8)	12 (12.1, 6–18.6)
Alcohol use disorder diagnosed	9 (8.9, 4.1–15.8)	16 (16.2, 8.5–23.5)
Substance use disorder diagnosed	13 (12.9, 6.9–19.6)	15 (15.2, 7.7–22.7)
Total AUDIT-C score (IQR)	7.46 (2)	7.76 (3)

Data are reported as mean (±SD) or *n* (%, 95% CI), unless otherwise specified.
AUDIT-C = three-item version of the Alcohol Use Disorder Identification Test; IQR = interquartile range.

At 6 weeks, a greater proportion of patients from the intervention group had reduced alcohol use below recommended levels compared to control group (72.2% vs. 51.8%, p = 0.01). Moreover, a greater proportion of patients from the intervention group attended to specialized treatment compared to control group (23% vs. 9.8%, p = 0.025). Table 2 shows outcomes at 6-week follow-up.

In the logistic regression models, the odds ratio (OR) for the intervention group drinking below recommended levels was 2.95 and the OR for attending to specialized treatment was 20.5. These results reached statistical significance. Tables 3 and 4 shows the regression models for the all outcomes. In the multiple linear regression model, intervention group ($\beta = 1.3$, $p < 0.05$) and higher AUDIT-C scores at baseline (0.67, $p < 0.05$) were associated with a greater reduction in the AUDIT-C at 6 weeks. The other variables did not reach statistically significant differences.

DISCUSSION

The results of this study suggest that a SBIRT program for risky drinkers in the ED is feasible and effective for reducing alcohol use and increasing treatment attendance. At 6-week follow-up, almost three of four patients in the intervention group had decreased alcohol use to under recommended maximum levels, almost 25% more than in the control group. Importantly, patients in the intervention group had odds of three times higher for this parameter (drinking below recommended levels at follow-up). In addition, BI

Table 2
Outcomes at 6 Weeks

	Group		
	Control	Intervention	p-value
Follow-up rate	81 (80.1, 72.3–87.7)	72 (72.7, 64.2–81.4)	0.217
Number of risky drinkers (*n*)	39 (48.1, 36.4–59.5)	20 (27.8, 17.2–39.2)	0.01
Number of patients attending to specialized treatment	8 (9.8, 4.1–7.3)	17 (23.6, 14.1–33.8)	0.025
Total AUDIT-C score (IQR)	5.05 (4)	3.65 (5.5)	<0.005
Mean AUDIT-C score reduction (IQR)	2.3 (4)	4.3 (5.5)	0.001

Data are reported as *n* (%, 95% CI), unless otherwise specified.
AUDIT-C = three-item version of the Alcohol Use Disorder Identification Test; IQR = interquartile range.

increases the probability of engaging with specialized treatment. The odds of attending to specialized treatment for patients entering the SBIRT program are more than 20 times higher than treatment as usual. This all suggests that the early results of this trial are encouraging.

In a large recently published meta-analysis,[22] BIs for alcohol use in EDs showed a small positive effect. Previous reviews did not find conclusive evidence or suggested no effects.[23–25] However, there is high heterogeneity in terms of methodologies and results. In many studies, the intervention was provided by research assistants with no background in addictive disorders who were trained specifically for the study.[16,26] In other intervention studies, SBIRT programs have been conducted by the ED staff; however, there is lack of time for training and motivation on alcohol interventions among these professionals,[27–30] which may have influenced results. While in other studies the intervention was delivered by professionals with clinical background on the field of alcohol[31,32] (such as alcohol counselors or nurses trained in substance use disorders), it is important to mention that our study is the first in which the SBIRT program is conducted by psychiatrists specialized in addictive behaviors and highly trained in motivational interviewing techniques. This represents an important difference with previously published studies. For instance, published evidence suggests different efficacy depending on who provides intervention[33,34] and our study results may be reflecting the effect of BIs provided by professionals with greater motivation and higher levels of training on alcohol use disorders and motivational techniques. Although BI was conceptualized as a short strategy for general practitioners and emergency staff, it does not mean that BI providers' instruction also must be short. To increase its effectiveness we will need to put more efforts on training. Another interesting perspective could be to consider including alcohol specialists in EDs as part of the staff. Taking into account the high prevalence of alcohol-related harm and the number of patients drinking above recommended levels presenting to emergency rooms, it would not be so weird to increase strategies to reduce alcohol consequences on public health.

Another important difference with other studies published is the target population. Our program aims

Table 3
ORs for No Longer Drinking Above Recommended Limits at the 6-Week Follow-up, Results of Binary Logistic Regression (*n* = 153)

	OR	95% CI (significance)
SBIRT program	2.95	1.37–6.36 (p = 0.05)
Male	2.1	0.923–4.92 (p = 0.065)
Age	1.04	1.01–1.06 (p = 0.02)
AUDIT-C total score	0.74	0.59–0.94 (p < 0.05)
Alcohol related presenting condition	1.61	0.23–11.06 (p = 0.34)
Alcohol use diagnosed	0.94	0.14–6.33 (p = 0.62)
Substance use diagnosis	1.98	0.6–6.43 (p = 0.265)

AUDIT-C = three-item version of the Alcohol Use Disorder Identification Test; SBIRT = Screening, Brief Intervention, and Referral to Treatment.

Table 4
ORs for Attending to Specialized Treatment: Results of Binary Logistic Regression (*n* = 155)

	OR	95% CI (significance)
SBIRT program	20.51	1.59–264.59 (p = 0.021)
Male	3.46	0.33–36.24 (p = 0.301)
Age	1.08	0.95–1.07 (p = 0.811)
Alcohol-related presenting condition	299.98	11.33–7943.81 (p < 0.05)
AUD	1.86	0.16–21.17 (p = 0.615)
AUDIT-C total score	1.54	0.99–2.42 (p = 0.055)
Substance use diagnosed	21.33	2.14–213.07 (p < 0.05)

AUDIT-C = three-item version of the Alcohol Use Disorder Identification Test; Screening, Brief Intervention, and Referral to Treatment.

to be universal and to be addressed to all patients presenting to the ED. Other studies were exclusively for injured patients or alcohol-related presenting conditions. Adopting narrower screening criteria may decrease costs and increase specificity; however, such a strategy fails to detect, asses, and intervene with at-risk patients who present to the ED with problems not directly related with alcohol use.[35] Less than 15% of the recruited patients in our study presented with an alcohol-related condition. Interestingly, a recently published meta-analysis found BI programs for injured patients to be less effective than those non–injury-specific programs.[36] Moreover, SBIRT programs have been shown to be more effective with risky drinkers than with alcohol-dependent patients.[19,31,37]

On the other hand, several previous studies used low cutoff points, which help to recruit large study samples, but may limit the global effect of BI and hamper finding significant differences. There is some evidence that low-risk drinkers benefit less from BI than moderate to high-risk drinkers.[38,39] For this reason, and according to our previous proposals,[40] we raised the cutoff point of the AUDIT-C score and this could also explain why our results are more encouraging than previously published studies.

All that aside, it seems that the selection of the target population is one of the main factors that can increase cost-effectiveness of an SBIRT program. It seems that there is an inverted U-shaped relationship between sensitivity to BI and alcohol use. Low-risk drinkers and alcohol-dependent patients are less prone to reduce alcohol use after receiving BI than those in the middle range of consumption. It is important not only to target interventions at injured patients, but also patients with less severe alcohol use, who are more sensitive to BI, thereby contributing to the prevention of future problems.[10] On the other hand, including very-low-risk drinkers in the target group will not increase efficacy of the program, but will increase costs and may overburden professional staff.[41]

Interestingly, when exploring results using logistic regression techniques, the AUDIT-C total score at baseline was a negative predictor for drinking below recommended levels at 6 weeks. However, if we analyze AUDIT-C score reduction at 6 weeks, the higher the score at baseline is, the greater the reduction at follow-up. Putting all this together, although the literature points out that patients with higher AUDIT scores are more sensitive to BI, it could also be argued that higher AUDIT-C scores reflect a higher probability of suffering alcohol dependence, and alcohol-dependent patients find it more difficult to reduce alcohol use below recommended levels.[19,37] Nonetheless, the health effect of a given alcohol reduction is stronger the higher the level of drinking.[42] Similarly, presenting to the ED with an alcohol-related problem is a predictor of attendance to specialized treatment, but does not predict a reduction of alcohol use to below recommended maximum levels. In the same way, it could be argued that presenting to the ED with alcohol-related problems reflects an advanced stage of alcohol use disorder and thus, less sensitivity to BI.

One of the goals of an SBIRT program is to engage undetected heavy drinkers with a specialized treatment resource. Our study shows that the SBIRT program increases the probability of treatment attendance more than twofold. In the intervention group, 23% of patients compared with 9% of control group patients attended an appointment in an addiction treatment facility. A recently published systematic review shows the scarcity of data regarding interventions in ED to increase alcohol treatment.[43] Despite a large number of studies that have evaluated SBIRT programs, few of them have evaluated the subsequent attendance at specialized treatment. It is important to remark that patients should be discharged from the ED with a scheduled appointment and also to remember that the sooner the postdischarge visit is, the greater the probability of attendance.[44] As previously commented, the most important predictor of attendance to the postdischarge appointment in our study was the presence of an alcohol-related presenting condition, with and OR of 299.97, which means that almost all patients with an alcohol-related diagnosis attended an appointment for alcohol use disorders after discharge, although an alcohol-related condition did not predict a greater reduction in future alcohol consumption compared to other patients who did not present with such a condition.

LIMITATIONS

Our study has several limitations that must be noted. First of all, although our results suggest that intervention provided by highly trained and specialized professionals may be more effective, SBIRT programs conducted by psychiatrists may be more difficult and costly to implement in general ED settings. However, this finding could encourage increased training of ED staff and means to motivate professionals to detect

and intervene with patients who drink above recommended levels.

Our study sample is a convenience one; sadly, it was not possible to implement a 24-hour program due to a lack of personal. However, as patients were included to the study by using systematic selection procedure, including consecutively all at-risk patients attended in the ED during the study recruiting frame times this should not reduce the validity of our results on these grounds.

We elevated AUDIT-C cutoff points, so the prevalence of risky drinkers is reduced and, as a result, we may lose a small percentage of patients who could have benefited from the intervention. However, as previously mentioned, we wanted to increase specificity and address BI to those patients more likely to be sensitive to such an intervention.

Alcohol use is self-reported and retrospective. Although this may represent some degree of bias, other methods to register alcohol use are very difficult to implement, especially in the ED context, and for this reason, self-report is the most widely used strategy in other similar studies. Moreover, social desirability may have affected alcohol use self-reports at follow-up, although this bias could be said to apply to both the intervention and the control groups. Finally, these are short-term results and, although they are very encouraging, we should be cautious and expect further evaluations before reaching final conclusions.

CONCLUSIONS

The results of this study show that a Screening, Brief Intervention, and Referral to Treatment program for risky drinkers in the ED is feasible and effective in reducing alcohol use and increasing attendance to subsequent alcohol use treatment. It is important to remark that the intervention was delivered by highly trained and motivated professionals and that this along with an adequate selection of the target population are believed to be key points in increasing efficacy.

References

1. Rehm J, Shield K, Rehm M, Gmel G, Frick U. Alcohol consumption, alcohol dependence and attributable burden of disease in Europe: potential gains from effective interventions for alcohol dependence. AMPHORA PROJECT. Brussels: European Comission, 2012.
2. Anderson P, Berridge V, Conrod P, et al. Reframing the science and policy of nicotine, illegal drugs and alcohol – conclusions of the ALICE RAP Project. F1000Research 2017;6:289.
3. Barrio P, Reynolds J, García-Altés A, Gual A, Anderson P. Social costs of illegal drugs, alcohol and tobacco in the European Union: a systematic review. Drug Alcohol Rev 2017;36:578–8.
4. Rossow I, Romelsjö A. The extent of the "prevention paradox" in alcohol problems as a function of population drinking patterns. Addiction 2006;101:84–90.
5. Kohn R, Saxena S, Levav I, Saraceno B. The treatment gap in mental health care. Bull World Health Organ 2004;82:858–66.
6. Wang PS, Angermeyer M, Borges G, et al. Delay and failure in treatment seeking after first onset of mental disorders in the World Health Organization's World Mental Health Survey Initiative. World Psychiatry 2007;6:177–85.
7. Rehm J, Rehm MX, Shield KD, Gmel G, Gual A. Alcohol consumption, alcohol dependence and related harms in Spain, and the effect of treatment-based interventions on alcohol dependence. Adicciones 2013;25:11–8.
8. Barrio P, Miquel L, Moreno-España J, et al. Alcohol in primary care. Differential characteristics between alcohol-dependent patients who are receiving or not receiving treatment. Adicciones 2016;28:116–22.
9. NICE Public Health Guidance. Alcohol-use Disorders: Preventing the Development of Hazardous and Harmful Drinking. London: National Institutes for Health and Clinical Excellence, 2010.
10. O'Donnell A, Anderson P, Newbury-Birch D, et al. The impact of brief alcohol interventions in primary healthcare: a systematic review of reviews. Alcohol Alcohol 2013;49:66–78.
11. Angus C, Latimer N, Preston L, Li J, Purshouse R. What are the implications for policy makers? A systematic review of the cost-effectiveness of screening and brief interventions for alcohol misuse in primary care. Front Psychiatry 2014;5:114.
12. Anderson P, Bendtsen P, Spak F, et al. Improving the delivery of brief interventions for heavy drinking in primary health care: outcome results of the Optimizing Delivery of Health Care Intervention (ODHIN) five-country cluster randomized factorial trial. Addiction 2016;111:1935–45.
13. Miquel L, Gual A, Vela E, et al. Alcohol consumption and inpatient health service utilization in a cohort of patients with alcohol dependence after 20 years of follow-up. Alcohol Alcohol 2016;52:227–33.
14. Baumeister SE, Meyer C, Carreon D, et al. Alcohol consumption and health-services utilization in Germany. J Stud Alcohol 2006;67:429–35.
15. Cherpitel CJ, Ye Y. Risky drinking, alcohol use disorders, and health services utilization in the U.S. general

population: data from the 2005 and 2010 national alcohol surveys. Alcohol Clin Exp Res 2015;39:1698–704.
16. Daeppen JB, Gaume J, Bady P, et al. Brief alcohol intervention and alcohol assessment do not influence alcohol use in injured patients treated in the emergency department: a randomized controlled clinical trial. Addiction 2007;102:1224–33.
17. Drummond C, Deluca P, Coulton S, et al. The effectiveness of alcohol screening and brief intervention in emergency departments: a multicentre pragmatic cluster randomized controlled trial. PLoS One 2014;9:e99463.
18. Heather N. Interpreting null findings from trials of alcohol brief interventions. Front Psychiatry 2014;5:85.
19. Blow FC, Ilgen MA, Walton MA, et al. Severity of baseline alcohol use as a moderator of brief interventions in the emergency department. Alcohol Alcohol 2009;44:486–90.
20. Suresh K. An overview of randomization techniques: an unbiased assessment of outcome in clinical research. J Hum Reprod Sci 2011;4:8–11.
21. Kohler S, Hofmann A. Can motivational interviewing in emergency care reduce alcohol consumption in young people? A systematic review and meta-analysis. Alcohol Alcohol 2015;50:107–17.
22. Schmidt CS, Schulte B, Seo HN, et al. Meta-analysis on the effectiveness of alcohol screening with brief interventions for patients in emergency care settings. Addiction 2016;111:783–94.
23. Wojnar M, Jakubczyk A. Brief interventions for hazardous and harmful alcohol consumption in accident and emergency departments. Front Psychiatry 2014;5:152.
24. Landy MS, Davey CJ, Quintero D, Pecora A, McShane KE. A systematic review on the effectiveness of brief interventions for alcohol misuse among adults in emergency departments. J Subst Abuse Treat 2016;61:1–12.
25. Merz V, Baptista J, Haller DM. Brief interventions to prevent recurrence and alcohol-related problems in young adults admitted to the emergency ward following an alcohol-related event: a systematic review. J Epidemiol Community Health 2015;69:912–7.
26. Sommers MS, Lyons MS, Fargo JD, et al. Emergency department-based brief intervention to reduce risky driving and hazardous/harmful drinking in young adults: a randomized controlled trial. Alcohol Clin Exp Res 2013;37:1753–62.
27. Bernstein E, Bernstein J, Feldman J, et al. An evidence-based alcohol screening, brief intervention and referral to treatment (SBIRT) curriculum for emergency department (ED) providers improves skills and utilization. Subst Abus 2007;28:79–92.
28. Mertens JR, Chi FW, Weisner CM, et al. Physician versus non-physician delivery of alcohol screening, brief intervention and referral to treatment in adult primary care: the ADVISe cluster randomized controlled implementation trial. Addict Sci Clin Pract 2015;10:26.
29. Broderick KB, Kaplan B, Martini D, Caruso E. Emergency physician utilization of alcohol/substance screening, brief advice and discharge: a 10-year comparison. J Emerg Med 2015;49:400–7.
30. Johnson J, Seale J. Implementing alcohol screening and brief intervention in primary care: identifying barriers, proposing solutions. Addict Sci Clin Pract 2015;10(Suppl 1):A24.
31. Academic ED SBIRT Research Collaborative. The impact of screening, brief intervention and referral for treatment in emergency department patients' alcohol use: a 3-, 6- and 12-month follow-up. Alcohol Alcohol 2010;45:514–9.
32. Bazargan-Hejazi S, Bing E, Bazargan M, et al. Evaluation of a brief intervention in an inner-city emergency department. Ann Emerg Med 2005;46:67–76.
33. Chi FW, Weisner CM, Mertens JR, Ross TB, Sterling SA. Alcohol brief intervention in primary care: blood pressure outcomes in hypertensive patients. J Subst Abuse Treat 2017;77:45–51.
34. Harris BR, Yu J. Attitudes, perceptions and practice of alcohol and drug screening, brief intervention and referral to treatment: a case study of New York State primary care physicians and non-physician providers. Public Health 2016;139:70–8.
35. Agerwala SM, McCance-Katz EF. Integrating screening, brief intervention, and referral to treatment (SBIRT) into clinical practice settings: a brief review. J Psychoactive Drugs 2012;44:307–17.
36. Elzerbi C, Donoghue K, Boniface S, Drummond C. Variance in the efficacy of brief interventions to reduce hazardous and harmful alcohol consumption between injury and noninjury patients in emergency departments: a systematic review and meta-analysis of randomized controlled trials. Ann Emerg Med 2017;70:714–23.
37. Saitz R. Alcohol screening and brief intervention in primary care: absence of evidence for efficacy in people with dependence or very heavy drinking. Drug Alcohol Rev 2010;29:631–40.
38. Tinghög ME, Tinghög P. Preventing alcohol problems and improving drinking habits among employees: an evaluation of alcohol education. Work 2016;53:421–8.
39. Conrod PJ, O'Leary-Barrett M, Newton N, et al. Effectiveness of a selective, personality-targeted prevention program for adolescent alcohol use and misuse. JAMA Psychiatry 2013;70:334.
40. Rehm J, Anderson P, Manthey J, et al. Alcohol use disorders in primary health care: what do we know and where do we go? Alcohol Alcohol 2016;51:422–7.
41. Sorsdahl K, Myers B, Ward C, et al. Screening and brief interventions for substance use in emergency departments in the Western Cape province of South Africa: views of

health care professionals. Int J Inj Contr Saf Promot 2014;21:236–43.
42. Rehm J, Roerecke M. Reduction of drinking in problem drinkers and all-cause mortality. Alcohol Alcohol 2013;48:509–13.
43. Simioni N, Rolland B, Cottencin O. Interventions for increasing alcohol treatment utilization among patients with alcohol use disorders from emergency departments: a systematic review. J Subst Abuse Treat 2015;58:6–15.
44. Williams S, Brown A, Patton R, Crawford MJ, Touquet R. The half-life of the "teachable moment" for alcohol misusing patients in the emergency department. Drug Alcohol Depend 2005;77:205–8.