Published in final edited form as:

Subst Abus. 2019 ; 40(1): 20–32. doi:10.1080/08897077.2018.1550465.

Use of non-face-to-face modalities for emergency department screening, brief intervention, and referral to treatment (ED-SBIRT) for high-risk alcohol use: a scoping review

Brian J. Biroscak, PhD, MS, MA,

Department of Emergency Medicine, Yale University School of Medicine

Michael V. Pantalon, PhD,

Department of Emergency Medicine, Yale University School of Medicine

James D. Dziura, PhD, MPH,

Department of Emergency Medicine, Yale University School of Medicine

Denise P. Hersey, MLS, MA, and

Department of Clinical Information Services, Cushing/Whitney Medical Library, Yale University

Federico E. Vaca, MD, MPH

Department of Emergency Medicine, Yale University School of Medicine

Abstract

Background: The purpose of this review was to examine and chart the ‘scope’ of strategies reported in ED-SBIRT studies (emergency department-based screening, brief intervention and referral to treatment) that employ non-face-to-face (nFtF) modalities for high-risk alcohol use (i.e., risk for alcohol-related injury, medical condition, use disorder); and to identify research gaps in the scientific literature.

Methods: The scoping review population included study participants with high-risk alcohol use patterns as well as study participants targeted for primary public health prevention (e.g., adolescent ED patients). Core concepts included SBIRT components among intervention studies that incorporated some form of nFtF modality (e.g., computer-assisted brief intervention). The context encompassed ED-based studies or trauma center studies, regardless of geographic location. After screening a total of 1,526 unique references, reviewers independently assessed 58 full-text articles for eligibility.

Corresponding Author: Brian J. Biroscak, PhD, MS, MA, 464 Congress Ave, Ste 260, New Haven, CT 06519, tel: +12037854363, fax: +12037854580, brian.biroscak@yale.edu.

Author Contributions:

BJB conceived and designed the study, acquired the data, and analyzed and interpreted the data; led the drafting and revision of the article; and gave final approval of the version to be submitted.

MVP contributed to analysis and interpretation of data; participated in critical revision of the article for important intellectual content; and gave final approval of the version to be submitted.

JDD contributed to analysis and interpretation of data; participated in critical revision of the article for important intellectual content; and gave final approval of the version to be submitted.

DPH contributed to acquisition of data; participated in critical revision of the article for important intellectual content; and gave final approval of the version to be submitted.

FEV made substantial contributions to design of the study and analysis of data; contributed to the drafting and revision of the article; and gave final approval of the version to be submitted.

Results: A total of 30 full-text articles were included. Articles covered a period of 14 years (2003–2016) and 19 journal titles. Authors reported the use of a wide range of nFtF modalities across all three ED-SBIRT components: ‘screening’—e.g., computer tablet screening—‘brief intervention’—e.g., text-message-based brief interventions—and ‘referral to treatment’—e.g., computer-generated feedback with information about alcohol treatment services. The most frequently used nFtF modality was computerized screening and/or baseline assessment. The main results were mixed with respect to showing evidence of ED-SBIRT intervention effects.

Conclusions: There is an opportunity for substance use disorder researchers to explore the specific needs of several populations—e.g., ED patients with co-occurring problems such as substance use disorder and violence victimization—and on several methodological issues—e.g., ED-SBIRT theory of change. Substance use disorder researchers should take the lead on establishing guidelines for the reporting of ED-SBIRT studies—including categorization schemes for various nFtF modalities. This would facilitate both secondary research (e.g., meta-analyses) and primary research design.

Keywords

Technology; Emergency Medicine; Mass Screening; Psychotherapy, Brief; Referral and Consultation; Alcohol Drinking; Alcohol-Related Disorders; Review

INTRODUCTION

Screening, brief intervention, and referral to treatment (SBIRT) has been defined as “a comprehensive, integrated, public health approach to the delivery of early intervention and treatment services for persons with substance use disorders, as well as those who are at risk of developing these disorders.”¹ The components of SBIRT involve: rapid assessment of the patient’s severity of substance use (‘screening’); increasing the patient’s awareness regarding substance use as well as their motivation to change behavior (‘brief intervention’); and providing those identified as needing additional treatment with access to specialty care (‘referral to treatment’). There exists a long history of SBIRT research and practice within emergency department settings (ED-SBIRT), with the first study being a controlled trial of 200 dependent drinkers at Massachusetts General Hospital in 1957.^{2, 3} Many authors have characterized the ED visit as a “teachable moment” when an individual patient might be especially amenable to change a health behavior such as high-risk alcohol use.^{4–9} Recently, ED-SBIRT researchers have been testing the effects of non-face-to-face (nFtF) modalities—e.g., computer-guided brief intervention. To our knowledge, there is currently no review of the literature that catalogues the extent, range, and nature (i.e., *scope*) of strategies and outcomes in ED-SBIRT studies that employ nFtF modalities for high-risk alcohol use.

As the most commonly used drug in the U.S., consequences of high-risk alcohol use persist as major short- and long-term detriments to both individual and population health. In 2015, the U.S. experienced the largest percent-increase in motor vehicle crash fatalities in 50 years.¹⁰ This included a significant increase in alcohol-impaired driving fatalities with nearly one alcohol-impaired driving death occurring every 51 minutes.¹¹ Total charges of ED visits with all-listed alcohol-related diagnoses totaled more than \$11 billion in 2010.¹² ED-SBIRT is one means of curbing these numbers and traditionally has been conducted by

physicians, nurses, or other personnel engaging patients one-on-one; yet several clinical-setting barriers to broad implementation exist.^{13–15} Included among the reported rationale for use of nFtF modalities in ED-SBIRT are: lack of participation by ED staff or other personnel in traditional SBIRT;^{4–7, 9, 16–19} greater likelihood of disclosing negative behaviors by patients;^{4, 7, 9, 17, 19} reduced likelihood of interfering with patient care;^{4, 7, 16} more freedom for participants to proceed with brief intervention components at their own pace;^{4, 7, 9} less time required of study personnel (e.g., research assistants);^{4–6, 20} less resources required for training and monitoring of brief intervention delivery personnel (e.g., to ensure fidelity);^{5, 6, 9, 18, 20} and the opportunity of providing a brief intervention that matches a patient's literacy level¹⁷ and native language.^{7, 19}

Understanding the scope of strategies and outcomes in ED-SBIRT studies that employ nFtF modalities for high-risk alcohol use is essential for improving evidence-based practice. In Figure 1, we depict one possible ordering of knowledge-synthesis methodologies. A narrative review can be characterized as a review of literature that is unsystematically searched with minimal data extraction, while evidence mapping may add a systematic search for evidence with tabular summaries of the findings of the studies.²¹ Whereas systematic reviews are narrow in focus and designed around specific research questions,^{22, 23} scoping reviews are wider-ranging in describing the nature and extent of existing evidence.²⁴ A scoping review has been defined as an “aim to map *rapidly* the key concepts underpinning a research area and the main sources and types of evidence available, and can be undertaken as stand-alone projects in their own right, especially when an area is complex or has not been reviewed comprehensively before.”²⁵ Other reasons for conducting a scoping review are to clarify working definitions and to elucidate the conceptual boundaries of a topic; and the benefits include clarifying key concepts for consistency of use by others, identifying gaps in the evidence base, and informing future study designs by documenting the ways that prior studies have been conducted.^{24, 26}

The primary objective of this scoping review was to examine and chart the extent, range, and nature of strategies reported in ED-SBIRT studies that employ nFtF modalities for high-risk alcohol use. Our secondary objective was to identify research gaps in the scientific literature specifically related to ED-SBIRT that employs nFtF modalities.

REVIEW

We performed a scoping review in accordance with the methodology for Joanna Briggs Institute scoping reviews,²⁴ which draws upon two other influential scoping review frameworks.^{26, 27} Scoping review methods can be reported under the following rubrics: inclusion criteria, types of sources, screening strategy, and extraction of results.

We framed our scoping review question as follows: “What types of strategies have been reported in ED-SBIRT studies that employ nFtF modalities for high-risk alcohol use?” Sources were considered for inclusion in the scoping review based on this review question, the aforementioned goals of this investigation, and the PCC mnemonic: Population, Concepts, and Context.²⁴ Our population of interest included study participants with high-risk alcohol use patterns (i.e., secondary/tertiary public health prevention) as well as study

participants targeted for primary public health prevention (e.g., adolescent ED patients). Core concepts included SBIRT components among intervention studies that incorporated at least one form of nFtF modality (e.g., self-administered computer assessment, telephone booster sessions, tailored mailings, etc.) for a purpose other than merely conducting SBIRT follow-up assessments. We excluded non-intervention studies as well as studies that did not incorporate (at a minimum) screening or brief assessment *and* brief intervention elements. The context encompassed ED-based studies or trauma center studies, regardless of geographic location. Articles had to be published in the English language; and the types of sources could not include lay publications or non-empirical works.

A senior medical librarian (DPH) searched for relevant articles in both PubMed (NLM/NIH) and Scopus (Elsevier) to help determine the appropriate controlled vocabulary terms and synonymous free-text words necessary to capture the concepts of *alcohol related disorders*, *emergency medical services*, and *screening or intervention(s)*. Next, we used an iterative process to translate and refine the searches to create more comprehensive searches performed on multiple databases: PubMed (NLM/NIH), Ovid PsycINFO (1967-July Week 2 2016), Scopus (Elsevier), and CINAHL (EbscoHost). All searches were conducted on July 12, 2016 except for CINAHL, which was searched on July 18, 2016. The search strategies were filtered to include only articles written in English, but results were not limited by study design or year of publication. All search strategies are available from the corresponding author upon request. A flowchart per PRISMA guidelines²⁸ is presented in Figure 2.

The final search retrieved a total of 1,658 references, which were pooled in EndNote™ (Clarivate Analytics, Philadelphia, PA) and de-duplicated to 1,526 references. This set was uploaded to Covidence® review software (Covidence, Melbourne, AU) for screening. Within Covidence, one reviewer (BJB) screened the title and abstract of the 1,526 de-duplicated records using the aforementioned inclusion/exclusion criteria. If no abstract was available and a decision could not be made otherwise, the reviewer searched online for additional information. We did not contact authors of primary studies for additional information at this stage.

After screening each record, two reviewers (FEV, BJB) independently assessed the remaining 58 full-text articles for eligibility. The same inclusion/exclusion criteria as above were applied. Reasons for exclusion of full-text articles included: wrong type of study design (n=17), wrong type of study outcome (n=8), wrong type of intervention (n=2), and wrong type of patient population (n=1). A total of 30 full-text articles were used for data extraction.

For included full-text articles, we extracted data into a Microsoft Excel® spreadsheet (Microsoft, Redmond, WA). We extracted data on the following items to inform the scoping review question and objectives: authors; publication year; article title; publication name; article keywords; study funder(s); study objectives; study design; inclusion criteria; exclusion criteria; study setting; SBIRT description (general); subject identification methods; screening methods; baseline assessment methods; brief intervention methods; referral to treatment methods; nFtF modality(-ies); study arm(s); follow-up measures; randomization methods; study blinding; statistical analyses; sample size; subject

characteristics; main findings; and (disclosed) limitations. Data coding and reduction was performed using IBM SPSS Statistics 24.²⁹

The main features of the 30 articles identified among ED-SBIRT studies employing nFtF modalities for high-risk alcohol use are listed in Table 1.^{4–9, 16–20, 30–48} Table 2 depicts the aggregated study characteristics of the 30 articles. The articles covered a period of 14 years (2003–2016) and 19 journal titles, with an apparent increasing trend in the frequency of articles over time (Figure 3). The greatest number of articles (n=10; 33%) were published in journals categorized by InCites™ Journal Citation Reports® (Thomson Reuters™) as a “SUBSTANCE ABUSE” publication. The study objectives of most articles fell within the purview of ED-SBIRT for efficacy testing (70%), but some were focused more so on feasibility testing (20%). Articles tended to be based on more-traditional study designs (e.g., two-group parallel RCT). Regarding inclusion criteria, more than one-third of the articles (n=12) reported results from studies focused on adolescents or young adults.

4, 5, 17, 18, 20, 31, 38, 43–45, 47, 48 Two articles were based on studies restricted to female participants.^{37, 42} A total of 13 US-based articles (43%) were based on studies that deemed non-English-speaking patients to be ineligible.^{7, 20, 30, 32, 37, 39, 40, 42–45, 47, 48} All but six articles^{9, 16, 33, 35, 36, 46} originated from U.S.-based studies.

We performed geospatial visualization by U.S. state for funding data as reported in NIH RePORTER by using Sci2, a modular toolset specifically designed for the study of science.⁴⁹ We also contacted lead authors to request confirmation of funding data as reported in NIH RePORTER or for actual funding amounts for studies not found in NIH RePORTER (U.S.-based only). Figure 4 is a proportional symbol map of total funding amounts by U.S. state. The greatest concentrations of funding were located in the Great Lakes and New England regions. We also attempted a temporal analysis using Sci2 software and applied Kleinberg’s burst-detection algorithm,⁵⁰ in order to identify sudden increases in the frequency of words contained within the 30 article titles as well as the author-designated keywords. The titles and keywords associated with these 30 articles were relatively homogenous over time (Online Supplementary Material).

The ED-SBIRT strategies of the 30 journal articles identified during the scoping review are shown in Table 3. The intervention objectives of most articles fell within the purview of ED-SBIRT for selective prevention (n=22; 73%). Among studies that reported the duration of subject recruitment (n=28), the range was from 1 month to 41 months (mean=22 months). Regarding the identification of potential study participants, only four articles^{30, 40, 47, 48} originated from studies that made mention of probabilistic selection procedures (e.g., ED shifts selected at random). Authors reported the use of a variety of standardized alcohol screening questions including the Alcohol Misuse Index (Amidx),⁵ the Alcohol Frequency/Quantity (AFQ) Index,⁵ the Alcohol Use Disorders Identification Test (AUDIT),^{6, 7, 16, 19, 33, 35, 36, 39, 42} the AUDIT Consumption (AUDIT-C),^{17, 18, 31, 34, 43–45, 47, 48} the time-line follow-back method (TLFB),²⁰ the TWEAK test,³⁷ the NIAAA questions,^{32, 39, 42} and the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST).⁴⁰ Whereas all articles reported both screening or assessment *and* brief intervention elements (see inclusion criteria above), less than two-thirds of articles (18/30)^{6, 16–20, 31, 34–37, 41–45, 47, 48} reported a ‘referral’ component, all of which were considered passive referrals. Authors

reported the use of a wide range of nFtF modalities across all three ED-SBIRT components: ‘screening’—e.g., computerized screening,^{4, 5, 8, 9, 16–20, 30, 31, 37, 38, 40, 43–45, 47, 48} telephone screening^{35, 36}—‘brief intervention’—e.g., computerized brief interventions,^{4, 5, 17–19, 31, 33, 41, 47, 48} bibliotherapy,^{6, 30} computer-generated feedback printouts,^{9, 16, 19} telephone brief interventions,^{7, 39, 40} telephone boosters,^{7, 20, 32–34, 38–40, 42} mailed personalized feedback,^{35, 36} text-message-based brief interventions,^{43–45} brochures³⁸—and ‘referral’—e.g., computer-generated feedback with info about alcohol treatment services,^{16, 19, 34, 41, 46} mailed personalized feedback with info about alcohol treatment services.^{35, 36}

The number of study ‘arms’ ranged from 1–6 (Table 3) and included a variety of comparison groups: e.g., assessment only with/without provision of information on alcohol support services. Follow-up assessments were conducted using a range of modalities—e.g., computer-assisted telephone interviews—and time periods—e.g., weekly, 30 days, 6 weeks, 2 months, 3 months, 4 months, 6 months, 8 months, 9 months, 12 months. Follow-up measures were also wide-ranging: proximal outcomes (e.g., readiness to change); alcohol-use for the 30 days prior; number of days drinking; average weekly consumption; heavy episodic drinking; driving behavior; alcohol-related negative consequences; alcohol-related injuries; and seeking support, resources, or treatment for alcohol use disorder. Randomized allocation to study arms was most often reported as ‘block randomization’; and blinding was not reported (or not applicable) in approximately one-third of the articles (11/30). With few exceptions,^{17, 18, 31, 38, 43–45} when study subject characteristics were reported, males constituted most participants (i.e., in studies not restricted to female participants^{37, 42}). Main results were mixed with respect to showing evidence of ED-SBIRT intervention effects (Table 1). Authors’ disclosed limitations tended to focus on: selective recruitment time periods; missing out on subjects eligible for inclusion in the study; lack of blinding; differential loss to follow-up; limited statistical power; sole reliance on participant self-report (29/30 articles); ceiling (or floor) effects; and uncertain generalizability of results.

CONCLUSIONS

To our knowledge, this scoping review represents the first catalogue of the extent, range, and nature (i.e., *scope*) of strategies and outcomes in ED-SBIRT studies that employed nFtF modalities for high-risk alcohol use. We extracted data from 30 full-text articles published in journals mostly classified as “Substance Abuse” or “Emergency Medicine” publications. In terms of study design, there is an opportunity for ED-SBIRT researchers to move beyond traditional designs (e.g., two-arm RCTs) and explore other study designs (e.g., micro-randomized trials⁵¹) and approaches (e.g., Multiphase Optimization Strategy [MOST]⁵²). Regarding inclusion criteria, there may be an opportunity to explore ED-SBIRT for high-risk alcohol use among older patients. None of the studies reviewed here were focused on older adults, and some researchers have called for ED clinicians to help heavy-drinking older adults reduce their high-risk alcohol use.⁵³ Another area for future research is ED-SBIRT focused on the specific needs of female patients—a demographic group that, over the past generation, has exhibited unfavorable trends regarding increases in alcohol consumption^{54, 55} and alcohol-involved fatal crashes.⁵⁶

To elaborate, only two of the articles reviewed here were focused on female participants—both of which had an emphasis on intimate partner violence (IPV).^{37, 42} Managers (e.g., hospital administrators, public health planners, policy makers) are not confronted with problems that are independent of each other, but with dynamic situations that consist of complex problems that interact with each other—i.e., “wicked problems” are those complex, ever changing problems that are difficult to define and structure properly because they are messy, ambiguous, and reactive.⁵⁷ Such is the case with *syndemics*, which involve a set of enmeshed and mutually enhancing health problems that, working together in a context of harmful social and physical conditions, can significantly affect the overall disease burden and health status of a community.⁵⁸ Of particular concern for population health managers is the set of mutually enhancing epidemics of substance abuse, violence, and HIV/AIDS, also referred to as the *SAVA syndemic*.⁵⁸ The SAVA syndemic is highly prevalent among impoverished urban women and potentially associated with poor HIV outcomes.^{59, 60} The most urgent concern for population health management of the SAVA syndemic among affected women and girls is early diagnosis and intervention as well as mental and physical rehabilitation to reduce damage caused by symptomatic disease (i.e., secondary/tertiary prevention). Although violence such as IPV and sexual assault is not restricted to female ED patients, emerging research suggests that SBIRT may reduce IPV and HIV risks for women;⁶⁰ but *integrated* substance abuse, violence, and HIV/AIDS SBIRT models have not been adequately tested.

Additionally—but also related to the above—13 articles reviewed here were based on studies that deemed non-English-speaking patients to be ineligible. There is an opportunity for additional investigation into ED-SBIRT for high-risk alcohol use among non-English-speaking patients. For example, one of the co-authors (BLINDED) is the Principal Investigator of an active, National Institutes of Health R01 study titled, “Automated Bilingual-Computerized Alcohol Screening and Intervention (AB-CASI).” That study is an ED-based health information technology initiative that addresses the full spectrum of alcohol use disorders (from “at-risk” to “dependence”) and their negative consequences in Latino ED patients. That study encompasses the rigorous testing of a brief intervention designed to facilitate alcohol use reduction and enhance engagement in specialized treatment initiation in Latino ED patients. AB-CASI is a tablet-delivered brief negotiation interview (BNI) encompassing branching logic and delivering motivational and personalized reflective statements. Provided in a busy clinical setting, AB-CASI embodies innovation where health information technology interfaces with disease prevention, health promotion, and clinical patient-oriented outcomes research. The purpose of the BNI is to assist patients to reduce/abstain from high-risk alcohol use. It combines techniques from motivational interviewing and behavioral contracting within a 5- to 10-minute SBIRT intervention for alcohol use. Moreover, only recently have emergency medicine researchers started to embrace technologic interventions for cooccurring phenomena such as substance use disorder and intimate partner abuse. However, authors have reported favorable findings with respect to feasibility of computerized screening and advice for women with partner abuse and drug use histories.^{61, 62}

In addition to future opportunities regarding the conduct of ED-SBIRT research with nFtF modalities, there exists opportunities to improve the reporting of such research. For instance,

in terms of the ‘screening’ component of ED-SBIRT, it would be beneficial for authors to clearly report the screening duration. This might help establish norms and set guidelines for what counts as ‘rapid assessment’ of a patient’s severity of substance use. Also, authors of the articles reviewed here reported the use of a wide range of nFtF modalities across all three ED-SBIRT components. Substance use disorder researchers should take the lead on establishing guidelines for the reporting of ED-SBIRT studies (e.g., CONSORT statement, STROBE guidelines, STARD guidelines)—including categorization schemes for various nFtF modalities. This would facilitate both secondary (e.g., meta-analyses) and primary research (e.g., future study design). Similarly, ED-SBIRT authors would benefit from standardized guidelines about what counts as ‘referral to treatment.’ Without such guidance, we cast a wide net in our scoping review about what counted as ‘referral to treatment’—everything from community brochures to social work consults. Recently, some authors have argued in favor of screening, *treatment initiation*, and referral (STIR) for substance use disorders.¹⁵

Also needed is research that develops the program theory—i.e., theory of how an intervention contributes to a chain of intermediate results and observed outcomes⁶³—for *how* ED-SBIRT contributes to positive outcomes, in order to successfully translate ED-SBIRT from one context (e.g., substance use) to another (e.g., substance use *and* IPV victimization). A program theory can help answer many complex questions including *why* an intervention was not successful and *what* changes should be made next time. For example, the primary way that motivational interviewing (MI) researchers try to describe the theory of MI is by evaluating which, if any, specific in-session patient verbal responses to an MI intervention are predictive of behavioral change. While this has turned out to be a relatively useful approach from full-fledged MI psychotherapy,⁶⁴ it has not been as useful in the brief intervention (BI) space, perhaps owing to the substantially fewer patient statements made within a 5- to 10-minute intervention vs. in multiple, hour-long therapy sessions. In fact, only one group has successfully tested their BI theory-of-change using a similar approach but with psychometrically sound adherence scales adapted for the brevity of BI.^{65, 66} A better understanding of ED-SBIRT’s theory-of-change could help future researchers select from among the myriad outcome measures and follow-up periods uncovered here.

This scoping review shows the diverse extent, range, and nature of strategies and outcomes reported in ED-SBIRT studies that employ nFtF modalities for high-risk alcohol use. Our review has several potential limitations. For pragmatic reasons, we excluded sources not published in the English language. However, the purpose of this scoping review was to give an *initial* overview of the literature available. Additionally, only one screener reviewed the title and abstract of the 1,526 de-duplicated records (Figure 2). However, we did share the list of 30 full-text articles used for data extraction with a group of highly experienced ED-SBIRT researchers to review for comprehensiveness. Another potential limitation is that we did not contact authors of primary studies for all potentially missing information. Thus, it is possible that some of the table cell entries recorded as “N/R” (not reported) may have been completed otherwise. Due to the substantial delay between submission of articles for peer-review and actual publication, it is possible that we missed some articles that are under review or in press—not to mention articles that were rejected or never submitted for publication. Lastly, although the absence of a meta-analysis may be perceived as a

limitation, determining the efficacy of interventions is not the purpose of a scoping review.²⁴ Moreover, the studies included here would be too heterogeneous to produce a single estimate of treatment effect.²²

The above insights and recommendations could help the pragmatic aspects of ED-SBIRT and potentially optimize wider adoption and implementation where currently, despite support and published best-practice guidelines, the large majority (i.e., most) EDs do not adhere to nor follow these guidelines—leaving patients' undetected high-risk alcohol use unaddressed, and set up for chronic alcohol use disorders and diseases, and premature death and disability. In summary, nFtF modalities have become a compelling option over the past 15 years for improving ED-SBIRT, especially given the widespread ownership and usage of mobile phones, computers, tablets, and other technology among ED patients.^{67, 68} We believe that the above recommendations can be the start of an agenda for improving the conduct and reporting of ED-SBIRT research with nFtF modalities.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Funding Sources/Disclosures:

Effort on this manuscript by BJB was supported by the National Institute on Minority Health and Health Disparities of the National Institutes of Health (NIH) Loan Repayment Program (LRP) under Award Number L60MD009893–01. The funding organization had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Effort on this manuscript by FEV was supported by the National Institute on Alcohol Abuse and Alcoholism of the National Institutes of Health, Office Of The Director, National Institutes Of Health (OD), Office of Behavioral and Social Sciences Research (OBSSR) under Award Number R01AA022083. The funding organization had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

REFERENCES

1. Substance Abuse and Mental Health Services Administration (SAMHSA). Screening, Brief Intervention, and Referral to Treatment (SBIRT). 2016;Available at: <https://www.samhsa.gov/sbirt>. Accessed March 15, 2017.
2. Bernstein E, Bernstein JA, Stein JB and Saitz R. SBIRT in Emergency Care Settings: Are We Ready to Take it to Scale? *Academic Emergency Medicine*. 2009;16(11):1072–1077. [PubMed: 20053225]
3. Chafetz ME, Blane HT, Abram HS, et al. Establishing Treatment Relations With Alcoholics. *Journal of Nervous & Mental Disease*. 1962;134(5):395–409. [PubMed: 13877834]
4. Gregor MA, Shope JT, Blow FC, Maio RF, Weber JE and Nypaver MM. Feasibility of using an interactive laptop program in the emergency department to prevent alcohol misuse among adolescents. *Annals of Emergency Medicine*. 2003;42(2):276–284. [PubMed: 12883517]
5. Maio RF, Shope JT, Blow FC, et al. A randomized controlled trial of an emergency department-based interactive computer program to prevent alcohol misuse among injured adolescents. *Annals of Emergency Medicine*. 2005;45(4):420–429. [PubMed: 15795723]
6. Apodaca TR, Miller WR, Schermer CR and Amrhein PC. A pilot study of bibliotherapy to reduce alcohol problems among patients in a hospital trauma center. *Journal of Addictions Nursing*. 2007;18(4):167–173.

7. Mello MJ, Longabaugh R, Baird J, Nirenberg T and Woolard R. DIAL: a telephone brief intervention for high-risk alcohol use with injured emergency department patients. *Annals of Emergency Medicine*. 2008;51(6):755–764. [PubMed: 18436341]
8. Blow FC, Walton MA, Murray R, et al. Intervention attendance among emergency department patients with alcohol-and drug-use disorders. *J Stud Alcohol Drugs*. 2010;71(5):713–719. [PubMed: 20731976]
9. Trinks A, Festin K, Bendtsen P and Nilsen P. Reach and effectiveness of a computer-based alcohol intervention in a Swedish emergency room. *International Emergency Nursing*. 2010;18(3):138–146. [PubMed: 20542239]
10. National Highway Traffic Safety Administration. Traffic Safety Facts: Research Note, 2015 Motor Vehicle Crashes: Overview. Washington, DC 8 2016. DOT HS 812 318.
11. National Highway Traffic Safety Administration. Traffic Safety Facts: 2015 Data, Alcohol-Impaired Driving. Washington, DC 12 2016. DOT HS 812 350.
12. National Institutes of Health. Alcohol-Related Emergency Department Visits and Hospitalizations and Their Co-Occurring Drug-Related, Mental Health, and Injury Conditions in the United States: Findings from the 2006–2010 Nationwide Emergency Department Sample (NEDS) and Nationwide Inpatient Sample (NIS). Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism; 9 2013. NIH Publication No. 13–8000.
13. Bernstein SL, Stoney CM and Rothman RE. Dissemination and Implementation Research in Emergency Medicine. *Academic Emergency Medicine*. 2015;22(2):229–236. [PubMed: 25640627]
14. Saunders EC and Kim E. Substance abuse treatment implementation research. *Journal of substance abuse treatment*. 2013;44(1):1–3. [PubMed: 23083972]
15. Bernstein SL and D’Onofrio G. Screening, treatment initiation, and referral for substance use disorders. *Addict Sci Clin Pract*. 2017;12(1):18. [PubMed: 28780906]
16. Neumann T, Neuner B, Weiss-Gerlach E, et al. The effect of computerized tailored brief advice on at-risk drinking in subcritically injured trauma patients. *The Journal of Trauma*. 2006;61(4):805–814. [PubMed: 17033544]
17. Cunningham RM, Walton MA, Goldstein A, et al. Three-month follow-up of brief computerized and therapist interventions for alcohol and violence among teens. *Academic Emergency Medicine*. 2009;16(11):1193–1207. [PubMed: 20053240]
18. Walton MA, Chermack ST, Shope JT, et al. Effects of a brief intervention for reducing violence and alcohol misuse among adolescents: a randomized controlled trial. *JAMA*. 2010;304(5):527–535. [PubMed: 20682932]
19. Vaca FE, Winn D, Anderson CL, Kim D and Arcila M. Six-month follow-up of computerized alcohol screening, brief intervention, and referral to treatment in the emergency department. *Substance Abuse*. 2011;32(3):144–152. [PubMed: 21660874]
20. Monti PM, Barnett NP, Colby SM, et al. Motivational interviewing versus feedback only in emergency care for young adult problem drinking. *Addiction*. 2007;102(8):1234–1243. [PubMed: 17565560]
21. Dijkers M What is a Scoping Review? KT Update. 2015;4(1):1–5.
22. Egger M, Smith GD and Altman DG. Systematic Reviews in Health Care: Meta-Analysis in Context. London: BMJ Books; 2001.
23. Glasziou P, Irwig L, Bain C and Colditz G. Systematic Reviews in Health Care: A Practical Guide. Cambridge: Cambridge University Press; 2001.
24. The Joanna Briggs Institute. Joanna Briggs Institute Reviewers’ Manual 2015: 2015 Edition/ Supplement. Adelaide, Australia: The University of Adelaide; 2015.
25. Mays N, Roberts E and Popay J. Synthesising research evidence In: Fulop N, Allen P, Clarke A and Black N eds. *Studying the Organisation and Delivery of Health Services: Research Methods*. London: Routledge; 2001:188–220.
26. Arksey H and O’Malley L. Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*. 2005;8(1):19–32.
27. Levac D, Colquhoun H and O’Brien KK. Scoping studies: advancing the methodology. *Implementation Science*. 2010;5(1):1–9. [PubMed: 20047652]

28. Moher D, Liberati A, Tetzlaff J, Altman DG and The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med*. 2009;6(7):e1000097. [PubMed: 19621072]
29. IBM Corp. IBM SPSS Statistics for Windows. Armonk, NY: IBM Corp.; 2016.
30. Blow FC, Barry KL, Walton MA, et al. The efficacy of two brief intervention strategies among injured, at-risk drinkers in the emergency department: impact of tailored messaging and brief advice. *Journal of Studies on Alcohol*. 2006;67(4):568–578. [PubMed: 16736077]
31. Cunningham RM, Chermack ST, Zimmerman MA, et al. Brief motivational interviewing intervention for peer violence and alcohol use in teens: one-year follow-up. *Pediatrics*. 2012;129(6):1083–1090. [PubMed: 22614776]
32. D'Onofrio G, Fiellin DA, Pantalon MV, et al. A brief intervention reduces hazardous and harmful drinking in emergency department patients. *Annals of Emergency Medicine*. 2012;60(2):181–192. [PubMed: 22459448]
33. Duroy D, Boutron I, Baron G, Ravaud P, Estellat C and Lejoyeux M. Impact of a computer-assisted Screening, Brief Intervention and Referral to Treatment on reducing alcohol consumption among patients with hazardous drinking disorder in hospital emergency departments. The randomized BREVALCO trial. *Drug and Alcohol Dependence*. 2016;165:236–244. [PubMed: 27370526]
34. Field C, Walters S, Marti CN, Jun J, Foreman M and Brown C. A multisite randomized controlled trial of brief intervention to reduce drinking in the trauma care setting: how brief is brief? *Annals of Surgery*. 2014;259(5):873–880. [PubMed: 24263324]
35. Havard A, Shakeshaft AP and Conigrave KM. Randomized Controlled Trial of Mailed Personalized Feedback for Risky Drinkers in the Emergency Department: The Impact on Alcohol Consumption, Alcohol-Related Injuries, and Repeat Emergency Department Presentations. *Alcoholism, Clinical and Experimental Research*. 2015;39(7):1260–1266.
36. Havard A, Shakeshaft AP, Conigrave KM and Doran CM. Randomized controlled trial of mailed personalized feedback for problem drinkers in the emergency department: the short-term impact. *Alcoholism, Clinical and Experimental Research*. 2012;36(3):523–531.
37. Houry D, Hankin A, Daugherty J, Smith LS and Kaslow N. Effect of a targeted women's health intervention in an inner-city emergency department. *Emergency Medicine International*. 2011;2011:543493. [PubMed: 22203904]
38. Linakis JG, Bromberg J, Baird J, et al. Feasibility and acceptability of a pediatric emergency department alcohol prevention intervention for young adolescents. *Pediatric Emergency Care*. 2013;29(11):1180–1188. [PubMed: 24168879]
39. Mello MJ, Baird J, Nirenberg TD, Lee C, Woolard R and Longabaugh R. DIAL: A randomised trial of a telephone brief intervention for alcohol. *Injury Prevention*. 2013;19(1):44–48. [PubMed: 22627778]
40. Mello MJ, Baird J, Lee C, Strezsak V, French MT and Longabaugh R. A randomized controlled trial of a telephone intervention for alcohol misuse with injured emergency department patients. *Annals of Emergency Medicine*. 2016;67(2):263–275. [PubMed: 26585044]
41. Murphy M, Smith L, Palma A, et al. Feasibility of a computer-delivered driver safety behavior screening and intervention program initiated during an emergency department visit. *Traffic Injury Prevention*. 2013;14(1):39–45. [PubMed: 23259517]
42. Rhodes KV, Rodgers M, Sommers M, et al. Brief motivational intervention for intimate partner violence and heavy drinking in the emergency department: a randomized clinical trial. *JAMA*. 2015;314(5):466–477. [PubMed: 26241598]
43. Suffoletto B, Callaway C, Kristan J, Kraemer K and Clark DB. Text-message-based drinking assessments and brief interventions for young adults discharged from the emergency department. *Alcoholism, Clinical and Experimental Research*. 2012;36(3):552–560.
44. Suffoletto B, Kristan J, Callaway C, et al. A text message alcohol intervention for young adult emergency department patients: a randomized clinical trial. *Annals of Emergency Medicine*. 2014;64(6):664–672.e664. [PubMed: 25017822]
45. Suffoletto B, Kristan J, Chung T, et al. An interactive text message intervention to reduce binge drinking in young adults: a randomized controlled trial with 9-month outcomes. *PLoS ONE*. 2015;10(11):e0142877. [PubMed: 26580802]

46. Trinks A, Festin K, Bendtsen P and Nilsen P. What makes emergency department patients reduce their alcohol consumption?--a computer-based intervention study in Sweden. *International Emergency Nursing*. 2013;21(1):3–9. [PubMed: 23273798]
47. Walton MA, Chermack ST, Blow FC, et al. Components of brief alcohol interventions for youth in the emergency department. *Substance Abuse*. 2015;36(3):339–349. [PubMed: 25222484]
48. Cunningham RM, Chermack ST, Ehrlich PF, et al. Alcohol interventions among underage drinkers in the ED: a randomized controlled trial. *Pediatrics*. 2015;136(4):e783–793. [PubMed: 26347440]
49. Sci2 Team. Science of Science (Sci2) Tool. 2009;Available at: <http://sci2.cns.iu.edu>.
50. Kleinberg JM. Authoritative sources in a hyperlinked environment. *Proceedings of the 9th Annual ACM-SIAM Symposium on Discrete Algorithms Vol.* San Francisco, CA1998.
51. Klasnja P, Hekler EB, Shiffman S, et al. Microrandomized trials: An experimental design for developing just-in-time adaptive interventions. *Health Psychol*. 2015;34s:1220–1228. [PubMed: 26651463]
52. Bernstein SL, Dziura J, Weiss J, et al. Tobacco dependence treatment in the emergency department: A randomized trial using the Multiphase Optimization Strategy. *Contemporary Clinical Trials*. 2018;66:1–8. [PubMed: 29287665]
53. Choi NG, Marti CNN, DiNitto DM and Choi BY. Alcohol Use as Risk Factors for Older Adults' Emergency Department Visits: A Latent Class Analysis. *Western Journal of Emergency Medicine*. 2015;16(7):1146–1158. [PubMed: 26759670]
54. Dawson DA, Goldstein RB, Saha TD and Grant BF. Changes in alcohol consumption: United States, 2001–2002 to 2012–2013. *Drug Alcohol Depend*. 2015;148:56–61. [PubMed: 25620731]
55. Grant BF, Chou S, Saha TD and et al. Prevalence of 12-month alcohol use, high-risk drinking, and dsm-iv alcohol use disorder in the united states, 2001–2002 to 2012–2013: Results from the national epidemiologic survey on alcohol and related conditions. *JAMA Psychiatry*. 2017.
56. Tsai VW, Anderson CL and Vaca FE. Alcohol involvement among young female drivers in US fatal crashes: unfavourable trends. *Injury Prevention*. 2010;16(1):17–20. [PubMed: 20179030]
57. Ritchey T *Wicked Problems - Social Messes: Decision Support Modelling with Morphological Analysis*. Vol 17 Heidelberg: Springer; 2011.
58. Singer M *Introduction to Syndemics : A Critical Systems Approach to Public and Community Health (1)*. Hoboken, US: Jossey-Bass; 2009.
59. Meyer JP, Springer SA and Altice FL. Substance abuse, violence, and HIV in women: a literature review of the syndemic. *J Womens Health (Larchmt)*. 2011;20(7):991–1006. [PubMed: 21668380]
60. Gilbert L, Raj A, Hien D, Stockman J, Terlikbayeva A and Wyatt G. Targeting the SAVA (Substance Abuse, Violence, and AIDS) Syndemic Among Women and Girls: A Global Review of Epidemiology and Integrated Interventions. *J Acquir Immune Defic Syndr*. 2015;69 Suppl 2:S118–127. [PubMed: 25978478]
61. Choo E, Ranney M, Wetle T, et al. Attitudes Toward Computer Interventions for Partner Abuse and Drug Use Among Women in the Emergency Department. *Addict Disord Their Treat*. 2015;14(2): 95–104. [PubMed: 26167133]
62. Choo EK, Zlotnick C, Strong DR, Squires DD, Tape C and Mello MJ. B-SAFER: A Web-Based Intervention for Drug Use and Intimate Partner Violence Demonstrates Feasibility and Acceptability Among Women in the Emergency Department. *Subst Abus*. 2015:0.
63. Funnell SC and Rogers PJ. *Purposeful Program Theory: Effective Use of Theories of Change and Logic Models*. San Francisco, CA: Jossey-Bass; 2011.
64. Miller WR and Rose GS. Toward a Theory of Motivational Interviewing. *The American psychologist*. 2009;64(6):527–537. [PubMed: 19739882]
65. Pantalon MV, Martino S, Dziura J, et al. Development of a Scale to Measure Practitioner Adherence to a Brief Intervention in the Emergency Department. *Journal of substance abuse treatment*. 2012;43(4):382–388. [PubMed: 23021098]
66. Pantalon MV, Dziura J, Li FY, Owens PH, O'Connor PG and D'Onofrio G. An interventionist adherence scale for a specialized brief negotiation interview focused on treatment engagement for opioid use disorders. *Subst Abus*. 2017;38(2):191–199. [PubMed: 28398192]
67. Post LA, Vaca FE, Biroscak BJ, et al. The Prevalence and Characteristics of Emergency Medicine Patient Use of New Media. *JMIR Mhealth Uhealth*. 2015;3(3):e72. [PubMed: 26156096]

68. Post LA, Vaca FE, Doran KM, et al. New Media Use by Patients Who Are Homeless: The Potential of mHealth to Build Connectivity. *Journal of Medical Internet Research*. 2013;15(9):138–147.

FIGURE 1.
Possible ordering of knowledge-synthesis methodologies (adapted from Dijkers²¹).

FIGURE 2.
PRISMA flow diagram for screening and assessment of papers for potential inclusion in nFtF ED-SBIRT scoping review.

FIGURE 3.
Bivariate scatter plot for frequency of nFtF ED-SBIRT publications (y-axis) by year of publication (x-axis).

Geospatial Visualization (Proportional Symbol Map)

nF2F ED-SBIRT Research Funding by 'State'
Mar 17, 2018 | 10:52:37 AM EDT

FIGURE 4.
Geospatial visualization (proportional symbol map) for nFtF ED-SBIRT research funding by U.S. state.

TABLE 1.
Data extracted from 30 articles retrieved during scoping review – Description of main study features.

Lead Author (Year)	Objective(s)	Study Design	Basic Eligibility	nFtF Modalities	Main Results
Gregor (2003)	To determine the feasibility of using an interactive laptop program with adolescent ED patients to prevent alcohol use and misuse.	Two-group parallel RCT (recruitment phase)	Patients were eligible for the study if they were 14-18 years of age presenting to the ED within 24 hours after an acute minor injury.	(1) Computerized screening (2) Laptop-based interactive computer program	Seventy-four percent of recent drinkers reported that the program made them rethink their alcohol use.
Maio (2005)	To test the effects of an ED-based laptop computer intervention for reducing the normative age-related increase in alcohol misuse compared with standard of care.	Two-group parallel RCT	Patients were eligible for the study if they were 14-18 years of age presenting to the ED within 24 hours after an acute minor injury.	(1) Computerized screening; (2) Laptop-based interactive computer program; (3) Computer-assisted follow-up assessment (telephone)	Outcomes for intervention and control were Amidx scores (3 mos.) 1.5 and 1.4; Amidx (12 mos.) 1.8 and 2.1; binge drinking (3 mos.) 0.9 and 0.8; and binge drinking (12 mos.) 1.4 and 1.2. Overall, there were no significant effects.
Blow (2006)	To test the effects of tailored versus generic messages, given with or without brief advice, at reducing alcohol consumption and consequences among injured, at-risk drinkers in an ED setting.	Four-group parallel RCT	Patients were eligible for the study if they were 19 years of age or older and had sustained an injury (E-codes 800-968).	(1) Computerized screening (2) Computer-generated booklet (3) Telephone follow-up assessment	Those in the brief advice conditions (tailored or generic) significantly decreased their average consumption during the 12 mos. compared with the no brief advice conditions.
Neumann (2006)	To test the effects of a self-administered, computer-generated brief intervention designed to reduce at-risk drinking in injured ED patients.	Two-group parallel RCT	Patients were eligible for the study if they were 18 years of age or older with a primary diagnosis of acute injury.	(1) Computerized screening (2) Computer-generated feedback letter (3) Telephone follow-up assessment (4) Computerized follow-up assessment (in person)	At 6 mos., a smaller percentage of intervention vs. control patients met criteria for at-risk drinking (SS) ^a ; and intervention patients decreased alcohol intake more than controls at 6- (SS) and 12 mos. (SS).
Apodaca (2007)	To test the effects of a self-help manual (bibliotherapy) versus assessment-only at reducing drinking levels, reducing negative consequences, and increasing levels of treatment-seeking at follow-up.	Two-group parallel RCT	Patients were eligible if they were admitted to the trauma center and age 18 or older.	(1) Bibliotherapy (2) Telephone follow-up assessment	Follow-up data (5 mos.) indicated patients in both conditions made significant reductions in drinking and negative consequences. Trend observed toward further treatment-seeking among bibliotherapy condition (NSS) ^b .
Monti (2007)	To test the effects of a brief motivational intervention (MI) that included personalized feedback compared to feedback only (FO) for reducing alcohol use and -problems among young adults.	Two-group parallel RCT	Patients were eligible if they were 18-24-years-old and they were treated in the ED.	(1) Computerized baseline assessment (counselor-administered) (2) Computer-generated personalized feedback report (3) Telephone boosters (4) Telephone follow-up assessment	At 6 mos., MI participants drank on fewer days, had fewer heavy drinking days, and drank fewer drinks per week in past mo. than did FO patients. These effects were maintained at 12 mos.
Mello (2008)	To test the effects of a brief intervention given by telephone after the ED visit, followed by a "booster" brief intervention telephone session 2 weeks later, on hazardous drinking and	Two-group parallel RCT	Noncritically injured adult patients were eligible to be screened with a health behaviors survey.	(1) Telephone baseline assessment (2) Telephone brief intervention (BI) (3) Telephone booster (4) Telephone follow-up assessment	Hazardous drinking decreased in both groups. Impaired driving decreased for the treatment vs. std. care group. Post-hoc analyses showed treatment effect only in highest-scoring baseline alcohol group.

Lead Author (Year)	Objective(s)	Study Design	Basic Eligibility	nRtF Modalities	Main Results
Cunningham (2009)	impaired driving at a 3-month follow-up. To determine the feasibility- and test the effects of computerized- and therapist brief interventions for alcohol and violence among adolescent ED patients.	Three-group parallel RCT	Patients were eligible if they were ages 14-18 years presenting to the ED for either medical illness or injury.	(1) Computerized screening (2) Computerized baseline assessment (3) Computerized BI (4) Computerized post-test (5) Computerized follow-up assessment	At 3-mos, participants in both interventions had SS reductions in positive attitudes for alcohol use; alcohol self-efficacy improved for therapist BI. Readiness to change was not improved.
Blow (2010)	To identify predictors of attendance at a post-ED intervention visit among inner-city ED patients who screen positive for an SUD (alcohol or other drug).	Two-group parallel RCT (sub-analysis of three-group parallel RCT)	Patients were eligible if they were ages 19-60 presenting to the ED for medical illness or injury.	(1) Computerized screening (2) Computerized baseline assessment	No differences in pattern of predictors of intervention attendance for brief motivational intervention vs. case management. Participants who attended were SS more likely to be in "action" stage of change.
Trinks (2010)	To test the effects of a computerized alcohol intervention that included two different types of tailored brief feedback on ED patients' drinking patterns.	Two-group parallel RCT	Patients were eligible if they were ages 18-69 years and registered at the triage room before receiving ED care.	(1) Computerized screening (2) Computer-generated feedback printout (3) Follow-up postal questionnaire	The feedback was effective in reducing the patient's weekly alcohol consumption and number of heavy episodic drinking occasions. Long feedback was slightly more effective (NSS).
Walton (2010)	To determine the efficacy of computerized- and therapist (assisted by computer) brief interventions addressing alcohol use and violence among adolescents presenting to an urban ED.	Three-group parallel RCT	Patients were eligible if they were ages 14-18 years presenting to the ED for either medical illness or injury.	(1) Computerized screening (2) Computerized baseline assessment (3) Computerized BI (4) Computerized follow-up assessment (in person)	At 6 mos., participants in therapist intervention showed reductions in alcohol consequences compared with controls; participants in computer intervention showed reductions in alcohol consequences.
Houry (2011)	To test the effects of a computer-based screening linked with targeted resources and brief, culturally-competent educational materials for at-risk female ED patients.	Two-group parallel RCT	Patients were eligible if they were an African American woman, aged 21-55, presenting to the ED waiting room during study hours, regardless of chief complaint.	(1) Computerized screening (2) Computerized follow-up assessment (in person)	Among women who completed follow-up, women in the intervention group were SS more likely to have contacted local resources and to have taken risk-reducing action.
Vaca (2011)	To measure change in alcohol consumption at 6 months following computerized ED-SBIRT with integrated brief negotiated interview and computer-generated personal alcohol reduction plans.	One-group pre-test with multiple post-tests (only one post-test reported)	Patients were eligible if they were 18 years of age or older.	(1) Computerized screening (2) Computerized BI (3) Computer-generated feedback printout (4) Telephone follow-up assessment	Forty-seven percent of at-risk drinkers were no longer drinking over recommended limits at 6-mo. follow-up. Reductions were greater for patients with AUDIT scores 1-7. Readiness to change was a good predictor.
Cunningham (2012)	To determine efficacy of computerized- and therapist (assisted by computer) brief interventions for alcohol use and violence at 12 mos. among adolescent ED patients.	Three-group parallel RCT	Patients were eligible if they were ages 14-18 years presenting to the ED for either medical illness or injury.	(1) Computerized screening (2) Computerized baseline assessment (3) Computerized BI (4) Computerized follow-up assessment (in person)	Brief intervention groups (computerized- and therapist assisted by computer) and control group did not differ on alcohol-related variables at 12 months.

Lead Author (Year)	Objective(s)	Study Design	Basic Eligibility	nRtF Modalities	Main Results
D'Onofrio (2012)	To determine if Brief Negotiation Interview (BNI) or a BNI with a booster reduces alcohol consumption compared with standard care; and determine the impact of research assessments on drinking outcomes.	Four-group parallel RCT	Patients were eligible if they were older than 18 years presenting to the ED.	(1) Telephone booster (2) Interactive voice response (IVR) assessments (3) Telephone follow-up assessment	Reduction in mean no. drinks in past 7 days from baseline to 6- and 12 mos. was SS greater in BNI with booster and BNI than in std. care. Reduction in 28-day binge episodes was SS greater in both BNI than in std. care.
Havard (2012)	To assess the short-term efficacy and cost-efficacy of mailed personalized feedback for problem drinking ED patients.	Two-group parallel RCT	Patients were eligible if they were aged 14 years and older presenting to the ED.	(1) Telephone screening (initially) (2) Mailed personalized feedback (3) Telephone follow-up assessment	At 6 wks. a SS effect of mailed feedback was observed only in patients with alcohol involved ED visit; and in this subset, those in intervention group consumed fewer drinks per week than control.
Suffoletto (2012)	To develop a text message (TM) based program, pilot test it for feasibility, and to provide variance in drinking-related outcomes to adequately power a clinical trial.	Three-group parallel RCT	Patients were eligible if they were between 18 and 24 years of age.	(1) Computerized screening (2) Computerized baseline assessment (3) TM assessment (+reminders) (4) Web-based follow-up assessment	At 3 mos., participants that were exposed to the TM-based intervention had 3.4 fewer heavy drinking days in last mo. and 2.1 fewer drinks per drinking day when compared to baseline.
Linakis (2013)	To determine feasibility and acceptability of a brief pediatric ED prevention intervention to delay/prevent initiation of alcohol use in 12- to 14-year-olds.	Two-group parallel RCT	Patients were eligible if they were aged 12-14 yrs. and were seen in the pediatric ED for non-life-threatening injury or illness.	(1) Computerized screening (2) Computerized baseline assessment (3) Brochures (4) Telephone booster (5) Web-based follow-up assessment	There were no differences between brief targeted prevention interventions and enhanced standard care among parent-adolescent dyads for substance-related outcomes.
Mello (2013)	To test the effects of a brief intervention (BI) given by telephone after ED visit, followed by a "booster" BI telephone session 2 weeks later, on alcohol use, alcohol-related injuries, and alcohol-related negative consequences at a 12-month follow-up.	Two-group parallel RCT	Patients were eligible for screening if they were 18 years of age or older and non-critically injured. (In 1st yr. only recruited motor vehicle crash patients and then for remainder of study all injured patients were screened for eligibility.)	(1) Telephone baseline assessment (2) Telephone brief intervention (BI) (3) Telephone booster (4) Telephone follow-up assessment	The difference in alcohol-related injuries between baseline and 12 mo. follow-up was greater in BI group than std. care group (SS). No difference was found in alcohol consumption and other negative consequences at 12 mos.
Murphy (2013)	To assess feasibility of computer-assisted assessment program to educate ED patients about risky driving behaviors and assess post-intervention behavior changes.	One-group pre-test/post-test	Patients were eligible if they were medically stable adult ED patients who self-identified as drivers.	(1) Computerized baseline assessment (2) Computer-generated feedback (3) Telephone follow-up assessment	All driving behaviors significantly decreased in comparison to baseline including: drinking and driving, 9 percent reduction.
Trinks (2013)	To test the effects of a computerized ED intervention for alcohol consumption and identify explanation factors associated with reduced consumption.	One-group pre-test/post-test	Patients were eligible if they were ages 18-69 years.	(1) Computerized baseline assessment (2) Computer-generated feedback printout (3) Follow-up postal questionnaire	A total of 339 patients could be followed up and of these 97 were categorized as risk drinkers at baseline and 45 became non-risk drinkers 6 mos. later.
Fields (2014)	To test the efficacy of 3 strategies that address heavy drinking among injured patients: brief motivational intervention (BMI), BMI plus booster (BMI + B), and brief advice (BA)	Three-group parallel RCT	Patients who were treated for unintentional injuries or intentional or violence-related injuries were eligible for inclusion in the study.	(1) Computerized baseline assessment (2) Telephone booster (3) Computer-generated printout (4) Telephone follow-up assessment	Compared with BA and BMI, BMI + B showed SS reductions in # std. drinks consumed per wk. at 3 and 6 mos.; % days of heavy drinking at 6 mos.; max. # std. drinks consumed in 1 day at 3 and

Lead Author (Year)	Objective(s)	Study Design	Basic Eligibility	nFtF Modalities	Main Results
Suffoletto (2014)	To test the efficacy of a 12-week short message service (SMS) intervention that encouraged lower alcohol consumption in hazardous-drinking young adults.	Three-group parallel RCT	Patients were eligible if they were between 18 and 25 years of age.	(1) Computerized screening (2) Computerized baseline assessment (3) TM assessment (reminders) (4) Web-based follow-up assessment	There were decreases in # of binge drinking days from baseline to 3 mos. in the SMS assessments plus feedback (SA + F) group. There were decreases in the # of drinks per drinking day from baseline to 3 mos. in the SA+F group. There was a lower mean proportion reporting a wkld. binge, and lower mean drinks consumed per wkld. during 12 wks. in the SA+F group compared with the SA group.
Cunningham (2015)	To determine the efficacy of computerized- and therapist (assisted by computer) brief interventions, with and without a post-ED session, in reducing primary outcomes of alcohol consumption and consequences among adolescents.	3 × 2 factorial design	Patients were eligible if they were ages 14-20 years presenting to the ED for either medical illness or injury.	(1) Computerized screening (2) Computerized baseline assessment (3) Computerized BI (4) Therapist post-ED session (computer facilitated) (5) Computerized/Web-based follow-up assessment	Therapist and computer BIs significantly reduced consumption at 3 mos., consequences at 3 and 12 mos., and prescription drug use at 12 mos.; the computer BI reduced the frequency of DUI at 12 mos.; and therapist BI reduced the frequency of alcohol-related injury at 12 mos. The post-ED session reduced alcohol consequences at 6 mos., benefiting those who had not received a BI in the ED.
Havard (2015)	To assess the effects of a mailed personalized feedback intervention for problem drinking ED patients over time.	Two-group parallel RCT	Patients were eligible if they were aged 14 years and older presenting to the ED.	(1) Telephone screening (initially) (2) Mailed personalized feedback (3) Telephone follow-up assessment	The intervention had no effect on alcohol consumption, while findings regarding alcohol-related injuries and repeat ED presentation were inconclusive.
Rhodes (2015)	To determine whether a brief motivational intervention for co-occurring IPV and heavy drinking provided at the time of an ED visit reduces IPV and heavy drinking.	Three-group parallel RCT	Patients were eligible if they were female between ages 18 and 64 years, who were not critically ill.	(1) Telephone booster (2) IVR follow-up assessments (3) Telephone follow-up assessments	For women experiencing IPV and heavy drinking, the use of a brief motivational intervention in the ED compared with assessed and no-contact controls did not significantly reduce the days of heavy drinking or incidents of IPV.
Suffoletto (2015)	To test the efficacy of a 12-week SMS intervention that encouraged lower alcohol consumption in hazardous-drinking young adults up to 6 months after intervention completion.	Three-group parallel RCT	Patients were eligible if they were between 18 and 25 years of age.	(1) Computerized screening (2) Computerized baseline assessment (3) TM assessment (reminders) (4) Web-based follow-up assessment	At 9-months, participants in the SA+F group reported greater reductions in the number of binge drinking days than participants in the control group (SS), lower binge drinking prevalence (SS), less drinks per drinking day (SS), and lower alcohol-related injury prevalence (SS). Participants in the SA group did not reduce drinking or alcohol-related injury relative to controls.
Walton (2015)	To examine changes at post-test in psychological constructs by condition in an ongoing RCT of underage drinkers in the ED; and examine associations between BI	Three-group pre-test/post-test (sub-analysis of 3 × 2 factorial design)	Patients were eligible if they were ages 14-20 years presenting to the ED for either medical illness or injury.	(1) Computerized screening (2) Computerized baseline assessment (3) Computerized BI (4) Therapist post-ED session (computer facilitated) (5)	As compared to controls, significant increases were found at post-test for the TBI in 'importance to cut down' and 'readiness to stop' and for the CBI in 'importance and likelihood to cut-down'.

Lead Author (Year)	Objective(s) components and changes in constructs.	Study Design	Basic Eligibility	nRtF Modalities Computerized/Web-based follow-up assessment	Main Results
Duroy (2016)	To assess the impact of a computer-assisted SBIRT model on daily consumption of alcohol by patients with hazardous drinking disorder detected during an ED visit.	Two-group parallel RCT	Patients were eligible if they were admitted to these EDs (for whatever reason), over 18 years old.	(1) Computerized screening (2) Computerized baseline assessment (3) Computer-assisted BI (4) Telephone booster (5) Telephone follow-up assessments	The two groups did not differ at 12 mos. on the primary outcome: mean # drinks per day in past wk. The two groups did not differ in any of the secondary endpoints.
Mello (2016)	To test the efficacy of a 3-session telephone brief motivational intervention delivered during 6 weeks for injured ED patients with alcohol misuse to decrease alcohol use, impaired driving, alcohol-related injuries, and alcohol-related negative consequences, against a time-equivalent assessment control condition also delivered in 3 telephone calls.	Two-group parallel RCT	Patients were eligible for screening if they were 18 years of age or older and had an ED visit for an injury.	(1) Computerized screening (2) Computerized baseline assessment (3) Telephone brief intervention (BI) (4) Web-based follow-up assessment	There were no differential benefits of telephone brief MI versus assessment and a control intervention in all 3 variables of alcohol use (frequency of binge alcohol use during the previous 30 days, max. number of drinks at one time in past 30 days, typical alcohol use in past 30 days), alcohol-impaired driving, alcohol-related injuries, and alcohol-negative consequences.

^aSS = statistically significant

^bNSS = not statistically significant

TABLE 2.

ED-SBIRT study characteristics extracted from 30 articles retrieved during scoping review

Characteristics	Frequency	Percentage
Publication year		
2000s	8	26.7%
2010s	22	73.3%
Journal category		
Substance abuse	10	33.3%
Emergency medicine	10	33.3%
Other (e.g., Nursing)	10	33.3%
Funder		
NIAAA (NIH)	14	46.7%
NCIPC (CDC)	4	13.3%
Other	9	30.0%
N/R	3	10.0%
Primary objective		
Efficacy testing	21	70.0%
Feasibility testing	6	20.0%
Other	3	10.0%
Study design		
Two-group parallel RCT	13	43.3%
Three-group parallel RCT	8	26.7%
Four-group parallel RCT	2	6.7%
One-group before and after	3	10.0%
Other	4	13.3%
Age-related inclusion criteria		
Adolescents only	8	26.7%
Young adults only	4	13.3%
Adolescents and older	2	6.7%
All other adults	16	53.3%
Injury-related inclusion criteria	9	30.0%
Native-language inclusion criteria	14	46.7%
Multi-center study	13	43.3%
Trauma-center study	19	63.3%
U.S.-based study	24	80.0%

TABLE 3.

Data extracted from 30 articles retrieved during scoping review – SBIRT strategies

Characteristics	Frequency (Mean)	Percentage (Std. Dev.)
SBIRT objective		
Universal – direct prevention	3	10.0%
Selective prevention	22	73.3%
Indicated prevention	5	16.7%
SBIRT subject selection		
Probability-based sampling	4	13.3%
Recruitment duration	22.0 months	12.0 months
Remuneration	\$57.10	\$59.57
Brief intervention (BI) strategies		
Motivational interviewing	14	46.7%
Post-ED booster	9	30.0%
Tailored messaging	8	26.7%
Interactive BI program	5	16.7%
Educational materials	5	16.7%
Text-message-based BI	3	10.0%
Other	5	16.7%
Referral to treatment strategies		
Passive referral	18	60.0%
Not reported	12	40.0%
Number of study arms		
1-2	18	60.0%
3-6	12	40.0%
Blinding	19	63.3%
# nFtF modalities	3.6	0.93
Number of follow-up assessments		
1	11	39.3%
2	9	32.1%
3 or more	8	28.6%
Maximum follow-up period	7.9 months	4.2 months
Sample size	507 patients	301 patients
Patient age	24.8 years	8.6 years