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Specialty substance use disorder services following brief alcohol intervention: a meta-analysis of randomized controlled trials

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ABSTRACT

Background and aims Brief alcohol interventions in medical settings are efficacious in improving self-reported alcohol consumption among those with low-severity alcohol problems. Screening, Brief Intervention and Referral to Treatment initiatives presume that brief interventions are efficacious in linking patients to higher levels of care, but pertinent evidence has not been evaluated. We estimated main and subgroup effects of brief alcohol interventions, regardless of their inclusion of a referral-specific component, in increasing the utilization of alcohol-related care. **Methods** A systematic review of English language papers published in electronic databases to 2013. We included randomized controlled trials (RCTs) of brief alcohol interventions in general health-care settings with adult and adolescent samples. We excluded studies that lacked alcohol services utilization data. Extractions of study characteristics and outcomes were standardized and conducted independently. The primary outcome was post-treatment alcohol services utilization assessed by self-report or administrative data, which we compared across intervention and control groups. **Results** Thirteen RCTs met inclusion criteria and nine were meta-analyzed ($n = 993$ and $n = 937$ intervention and control group participants, respectively). In our main analyses the pooled risk ratio (RR) was = 1.08, 95% confidence interval (CI) = 0.92–1.28. Five studies compared referral-specific interventions with a control condition without such interventions (pooled RR = 1.08, 95% CI = 0.81–1.43). Other subgroup analyses of studies with common characteristics (e.g. age, setting, severity, risk of bias) yielded non-statistically significant results. **Conclusions** There is a lack of evidence that brief alcohol interventions have any efficacy for increasing the receipt of alcohol-related services.

Keywords Alcohol, brief intervention, meta-analysis, referral to treatment, treatment initiation, treatment utilization.

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INTRODUCTION

Unhealthy alcohol use includes a spectrum of alcohol use, ranging from risky drinking to a clinically diagnosed alcohol use disorder [1]. Unhealthy alcohol use is the third leading cause of death in the United States [2,3], and is estimated to cost the United States over $230 billion annually [4]. Approximately 17.6 million adults in the United States meet criteria for a past-year alcohol use disorder, but just 6% of these individuals receive treatment and only 11% report that they need or want help for their drinking [5,6]. Although very few individuals receive treatment for their alcohol problems [7], various forms of alcohol treatment are cost-effective and improve clinical outcomes [8–15].

Although few people attend medical care to address their drinking, health-care visits present an opportunity to identify alcohol problems through universal screenings and to provide brief advice or motivational interventions to encourage individuals to reduce their drinking [16–18]. Alcohol screening and brief intervention (SBI) in medical settings is efficacious for those with mild to moderate

alcohol problems [19], including those who meet the National Institute on Alcohol Abuse and Alcoholism's definition of at-risk drinking or DSM-IV criteria for alcohol abuse [20,21], but it may not be either as applicable or as effective in those with more severe patterns of use. SBI guidelines recommend that individuals with severe forms of unhealthy alcohol use such as DSM-IV alcohol dependence [20] be referred to more intensive services, such as treatments with addiction specialists [18,21,22]. To address the full spectrum of unhealthy alcohol use, including those with severe problems, Screening, Brief Intervention and Referral to Treatment (SBIRT) programs call attention to efforts to refer individuals to treatment [18]. For instance, SBIRT emphasizes the coordination between community services systems (e.g. general health-care and specialty addiction treatment agencies) to improve the quality and success of referrals [18]. Theoretically, SBIRT extends SBI to those with more severe conditions, with services matched to the level of need of all individuals with unhealthy alcohol use [18].

Although several systematic or meta-analytical reviews have demonstrated the effectiveness of brief alcohol interventions in reducing alcohol consumption [23–25], the ability of SBI or SBIRT programs to increase the utilization of alcohol-related care needs further investigation. Surprisingly, reviews of SBIRT have not attempted to evaluate the referral to treatment components of these programs [26,27], or have found insufficient evidence to do so [28,29]. For instance, one systematic review sought to examine the efficacy of SBIRT in adolescents, but it identified no randomized controlled trials (RCTs) that either evaluated referral to treatment or reported the percentage of participants eligible for referral based on screening results [28]. Existing reviews of SBI have also not provided adequate data to inform the referral to treatment component of SBIRT. A systematic review in 2010 of RCTs of SBI in primary care settings that included drinkers with alcohol dependence found no studies that examined linkage to alcohol treatment as a study outcome [30]. Two other systematic reviews (including one meta-analysis) evaluated the effect of brief interventions on subsequent health-care utilization (i.e. in-patient, out-patient and emergency care), but neither specifically examined utilization of specialty alcohol treatments [31,32]. Overall, reviews have produced insufficient evidence to evaluate whether or not brief alcohol interventions actually increase subsequent treatment utilization.

Given the current state of the literature, we reviewed and meta-analyzed RCTs systematically to evaluate the extent to which brief alcohol interventions in medical settings are effective in linking people to alcohol-focused services. Our primary analyses compared the outcome of post-treatment alcohol services utilization across intervention and control groups of RCTs. The effect of SBI on the utilization of alcohol-related care could depend upon intervention characteristics such as intervention intensity (e.g. number of sessions) [33] and the presence of active efforts to refer individuals to alcohol-related care (e.g. addressing concerns about obtaining addiction treatment) [34], so we conducted subgroup analyses to account for clinical heterogeneity [35]. The evidence for SBI has been evaluated separately in several reviews based on other study characteristics, such as age (adolescent versus adult) [28,36], clinical setting [37,38] and alcohol use severity [30], which we also considered in subgroup analyses. Lastly, our secondary goal was to evaluate whether or not alcohol-related outcomes improved among those who were referred to higher levels of care, which is the purpose of referring people to treatment [34]. To accomplish this goal, we conducted a qualitative review of results from the RCTs of brief alcohol interventions that attempted to evaluate the association between alcohol treatment utilization and clinical outcomes.

METHOD

This review followed guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) statement [39].

Inclusion criteria

We included studies meeting the following criteria: (1) RCT, (2) intervened with unhealthy alcohol use in medical settings, (3) study sample was not seeking alcohol treatment at the time of recruitment, (4) linkage to alcohol-related services, such as specialty addiction treatment or mutual help programs, was assessed as an intervention outcome or as a mediator of intervention outcomes, and (5) published in the English language. SBIRT programs vary in the specific referral processes used to link clients to treatment [18]; hence, we did not restrict studies to any particular treatment or referral modality. We did not limit our inclusion of studies to any specific country.

Exclusion criteria

Because our focus was on alcohol-related brief intervention approaches, we excluded studies involving participants with drug but not alcohol use. To maximize generalizability, we excluded studies in which the outcome consisted of attendance at treatment sessions that were delivered by clinical research interventionists as part of the research study [40,41]. It was not an objective of our study to evaluate the integration of addiction treatment into general health-care settings [42,43]. We excluded these studies, which may have evaluated the receipt of alcohol-related care within the same setting, because their results would

probably not generalize to SBI or SBIRT programs. Integrated treatments use different transition practices (e.g. consults to providers in the same clinic) and require different organizational resources (e.g. embedded addiction specialists), yet they generally provide less intensive services than specialty treatment programs targeted by referrals [34].

Data sources and searches

We conducted an extensive database search, expert query and hand search to identify papers. The database search, which was conducted with assistance from a reference librarian, identified peer-reviewed studies published in the English language until 26 July 2013 in MEDLINE, PsycINFO and CINAHL Plus (see Supporting information, Table S1 for search keywords). A hand search, which targeted peer-reviewed papers and grey literature, was conducted by examining references of the included studies, SBIRT bibliographies and several relevant review papers [18,26–28,31,32,44,45]. Authors of the identified studies were e-mailed, requesting that they provide knowledge of existing studies related to the review.

Study selection

Abstracts were screened and discarded if studies clearly did not meet the inclusion/exclusion criteria. Remaining papers were retrieved for the full-text review. The first author read and evaluated each paper against the inclusion/exclusion criteria, seeking assistance from other authors when necessary.

Data extraction and quality assessment

Two authors independently reviewed papers identified by the literature search to extract data regarding outcomes, study characteristics and risk of bias. Data extraction was standardized with forms and meetings were held to review study data and to identify and resolve discrepancies.

Primary outcome measure

We extracted raw counts of alcohol treatment utilization for the treatment and control groups or derived the raw counts if only percentages were reported. We also recorded whether a statistically significant difference was found when comparing post-intervention drinking-related outcomes and alcohol treatment utilization between intervention and control groups. Study authors were emailed to request these data if not provided in the publication.

Study characteristics

We grouped studies by the age of the sample (adolescent versus adult). We also extracted data on the health-care setting of the intervention (medical in-patient units, general health-care settings, emergency departments) [31]. We classified intervention intensity as low for interventions with no in-person contact, medium for studies with a single session intervention and high for multiple-session interventions. The severity of alcohol use in the study samples was classified as high for strictly alcohol-dependent samples, alcohol detoxification samples or samples recruited for having severe alcohol-induced medical problems; low for samples that excluded dependent drinkers; and mixed for samples with a broad range of alcohol use (e.g. included both risky/problem drinking and alcohol dependence, included dependent and non-dependent drinkers but excluded heavy drinkers). We also recorded all information about referral-specific interventions that were included in the intervention and control groups (e.g. providing lists of treatment agencies to the participants) and noted when referral-specific interventions were isolated to the treatment group.

Data synthesis and analysis

Meta-analysis was performed with the metan package in Stata version 13 [46]. We calculated risk ratios (RR) and 95% confidence intervals (CI) in models with random effects and used a forest plot to visualize the findings. Heterogeneity among studies was assessed with the I^2 statistic, which describes the proportion of variation across studies due to heterogeneity versus chance [47]. We performed subgroup analysis of the studies based on study characteristics (i.e. age, setting, intervention intensity and population severity) and conducted a sensitivity analysis by excluding studies with a risk of bias in more than two areas.

Risk of bias

Study-level risk of bias was ascertained with the following characteristics: randomization concealment, proportion of participants lost to follow-up [48], standardization of intervention delivery (e.g. trained interventionists, followed treatment manuals) and presence of an intent to treat analysis [48]. Outcome-level risk of bias focused on the validity of the treatment utilization analyses, including the measurement properties of the instruments [49,50] and blinding of outcome assessment [51]. Risk of bias was assessed for the purpose of sensitivity analysis (see Meta-analysis).

Publication bias

We checked for systematic bias in reporting [52] using the metafunnel and metabias commands in Stata. We constructed a funnel plot of each trial's effect size against its

standard error then used the Harbord test for binary outcome data [53] to examine the association between study effect sizes and sample sizes.

RESULTS

Study characteristics

The literature search yielded 13 independent RCTs of brief alcohol interventions that evaluated post-intervention alcohol treatment utilization (see Fig. 1). Supporting information, Table 2 provides reasons for exclusion of several studies that met inclusion/exclusion criteria most closely. Interventions were delivered in medical in-patient units [33,54], general health-care settings [55–57] and emergency departments (see Table 1) [58–65]. Four RCTs were conducted outside the United States, including France, Germany, Poland and Australia [55,57,59,60]. The majority of interventions involved brief advice or a motivational interview [33,54,58,59,61,62,64–66]; several offered additional counseling or booster intervention sessions [55,57,61,66] and one intervention had no in-person contact and simply mailed a letter to participants requesting they make an appointment with a specialist [60].

Referral-specific components of the interventions

Although all studies conducted efforts that could potentially inspire help-seeking (e.g. motivational sessions), five of the 13 studies did not articulate any referral-specific processes in the intervention group [33,55–58] and the remaining eight studies described a referral-specific intervention. All these eight studies provided information about alcohol treatment options in the community [54,59–65], and three of them described more active efforts to encourage help-seeking. Active efforts to encourage help-seeking included one study that had an intervention session devoted to discussing treatment options [54], another study that included a booster session where previously supplied treatment referral materials were reviewed [61] and another study that mailed a letter to patient homes to encourage them to make an appointment with a specific treatment center [60].

In total, six of the eight studies with referral-specific efforts isolated these referral-specific efforts to the intervention group [54,59–63]. The other two studies provided only information about treatment options as the referral-specific effort, but provided the same information to the control group [64,65]. A more detailed description of the intervention and control groups of the studies is included in Supporting information, Table 3.

Measurement of alcohol-related care

In 11 of 13 studies, the presence of treatment utilization was defined as receiving one or more sessions of specialty addiction treatment [33,54,55,58–65], whereas the remaining two studies analyzed counts of specialty addiction treatment visits [56,57]. Four studies used treatment agency or state administrative data to assess treatment utilization [54,56,60,61] and the rest used self-report. Study-specific measures of self-reported treatment utilization were common [55,57,59,62–65]; just two studies assessed self-reports of alcohol treatment utilization with validated instruments [33,58]. Follow-up periods ranged from 3 to 18 months, except for one study [57] that had a 10-year follow-up.

Utilization of alcohol-related care

Just one study found a significant difference between treatment and control groups in the utilization of alcohol treatment (see Table 2) [60]. Studies conducted in in-patient settings and/or with high-severity samples tended to have the highest rates of post-intervention alcohol treatment utilization (18.9–56.1% in the intervention groups obtained alcohol treatment) [33,54,55]. In comparison,

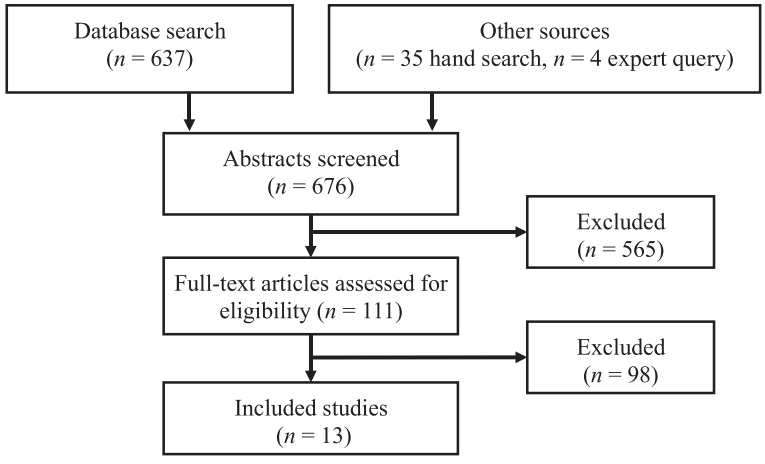

Figure 1 Flow diagram depicting the process for identifying studies. All papers identified by the hand search or author query that met criteria for inclusion were also identified in the database search. No grey literature that met our inclusion/exclusion criteria was identified

Table 1 Randomized controlled trials of brief alcohol interventions that assessed post-intervention alcohol treatment utilization ($n = 13$).

Study	*Setting*	*Screening method*	*Population*	*Recruited n*	*Intervention*	*Control*
Batel 1995	Emergency unit of a French university hospital	Alcohol-positive admission	Adult patients admitted for drunkenness (police, GP, relatives, self-admitted)	369	Mailed letter	No letter
Bischof 2008	81 general medical practices in Germany	Universal screening	Adult health-care users with alcohol dependence, alcohol abuse, at-risk drinking, and heavy episodic drinking	408	Group 1: Computerized intervention plus telephone sessions as needed (stepped care); Group 2: Computerized intervention and four telephone sessions (full care)	Workbook only
Copeland 2003	VA and private sector primary care offices	Universal screening	Older adult veterans recruited from the waiting room	228	Brief intervention including workbook and behavioral self-control training strategies	General health advice
Cherpitel 2009	Polish emergency department	Universal screening	Adult patients aged 18+ recruited from emergency department	446	Screening, brief intervention, and referral to treatment	Group 1: Full assessment plus list of 12-Step groups and treatment agencies; Group 2: No assessment
Field 2010	Level 1 trauma center	Universal screening	Adult Black, White and Hispanic patients admitted to the trauma center with at-risk drinking	1336	Brief motivational interview	Assessment plus information about drinking and list of available treatment
Monti 2007	Emergency department (level 1 trauma center)	Universal screening	Adult (18–24-year-old) patients who were alcohol-positive at intake or who were screened as having alcohol problems	198	Motivational interviewing session with two boosters	Feedback only plus two brief boosters
Monti 1999	Emergency department	Alcohol-positive admission	Adolescents who had alcohol-positive admission in an emergency department	94	Brief motivational interview	Brief discussion, handouts on avoiding drinking and list of treatment agencies
Saitz 2007	In-patient units of an urban teaching hospital	Universal screening	Adult medical in-patients with risky drinking	341	Brief motivational counseling	Provided screening results
Kuchipudi 1990	Acute VA medical unit staffed by gastroententerologists	Alcohol-positive admission	Adult veterans with alcohol-related medical problems	114	Motivational intervention by medical staff	Regular medical and psychosocial follow-up with supportive therapy to maintain sobriety
Bernstein 2010	Pediatric emergency department	Universal screening	Adolescent/young adults (14–21-year-olds) from pediatric emergency department within level-1 trauma center	853	Motivational intervention plus 10-day booster	Group 1: Full assessment; Group 2: Minimal assessment. Both groups provided list of treatment facilities

Gentilello 1999	Level 1 trauma center	Universal screening	Adults with injuries and alcohol misuse	762	Single motivational interview with a psychologist and follow-up handwritten letter	Baseline assessment randomly in 45%
Crawford 2004	Accident and emergency department at a general hospital in London	Selective screening	Adults with hazardous drinking per the Paddington Alcohol Test	599	Information leaflet about drinking, contact details for local and national agencies, plus appointment with alcohol health worker	Information leaflet about drinking plus list of national and local treatment agency contacts
Wutzke 2010	General practice, out-patient or acute medical care, and a health screening program in Australia	Universal screening	Adult non-dependent drinkers with 10-year follow-up in a cross-national study	554	Group 1: Simple advice; Group 2 additional brief counseling, Group 3: Extended counseling (two additional sessions)	None (assessment only)

studies conducted in emergency departments and/or with mixed severity samples had a lower range of post-intervention alcohol treatment utilization (1.9–32.8% in the intervention groups obtained alcohol treatment) [59–63,66].

Alcohol-related outcomes

Nine of 13 studies reported improvements in one or more drinking-related outcomes due to brief intervention at one or more time-points [55,57–59,61–65], and two studies did not examine drinking-related outcomes [56,60]. Just two studies considered the association between alcohol treatment utilization and alcohol-related outcomes. One found that SBI was associated with reductions in drinking and driving, moving violations, alcohol-related injuries and alcohol-related problems, but stated that the small sample size ($n = 94$) precluded a formal statistical analysis to evaluate whether post-intervention alcohol treatment utilization mediated the association between brief intervention and treatment outcomes [65]. A second study also did not conduct a formal mediation analysis, but stated that the effects of SBI on alcohol consumption was not due to the receipt of specialty alcohol treatment, because post-intervention treatment utilization rates were similarly low in the intervention and control groups (4.7 versus 4.8%, respectively, received formal treatment and 15.6 versus 13.7%, respectively, attended self-help groups) [62].

Risk of bias

Supporting information, Table 4 contains results of the risk of bias assessment. Although all studies discussed aspects of randomization, only one reported off-site assignment [33] or sequential assignment of sealed opaque cards to ensure concealment of randomization. The study that had a high risk of bias in four of six domains was also the only study that found significant effects on treatment utilization [60].

Publication bias

The funnel plot and Harbord tests did not produce evidence of publication bias.

Meta-analysis

Sufficient data were obtained from 10 studies to meta-analyze the association between receipt of brief intervention and subsequent alcohol treatment initiation (see Table 2). We focus our meta-analyses on nine of 10 studies that had available data, excluding the study with a risk of bias in four of six domains [60]. In these nine studies, there were $n = 993$ and $n = 937$ intervention and control group participants, respectively. Receipt of brief intervention was not associated significantly with subsequent alcohol

Table 2 Data for meta-analysis of randomized controlled trials (RCTs) examining the association between brief alcohol intervention and post-intervention utilization of alcohol-related care ($n = 13$ overall; $n = 10$ had sufficient data).

Study	*Setting*	*Age*	*Sample severity*	*Intervention intensity*	*Referral effort isolated to treatment group*	*Improved drinking-related outcomes*	*Type of alcohol-related care*	*Increased alcohol-related care*	*Utilization improved drinking-related outcomes*	*Meta-analyzed*	*Received alcohol-related care n (%)*			
											Intervention group		*Control group*	
Batel 1995	ED	Adult	Mixed	Low	Yes	Not tested	Treatment only	Yes	Not tested	Yes[c]	188	11.2%	181	1.1%
Bernstein 2010	ED	Adolescent	Mixed	High	Yes	Yes	Treatment only	No	Not tested	Yes	207	1.9%	209	2.4%
Bischof 2008*	Primary care	Adult	High	High	No	Yes	Treatment and mutual help	No	Not tested	Yes	37	18.9%	36	11.1%
Cherpitel 2010	ED	Adult	Mixed	Medium	Yes	Yes	Not clear	No	Not tested	Yes	80	2.5%	97	1.0%
Copeland 2003	Primary care	Adult	Mixed	Medium	No	Not tested	Treatment only	No	Not tested	No	100	NA	105	NA
Crawford 2004	ED	Adult	Mixed	Medium	Yes	Yes	Treatment only	No	Not tested	Yes	131	32.8%	159	30.8%
Field 2010	ED	Adult	Mixed	Medium	No	Yes	Treatment and mutual help	No	Not tested	No	NA	NA	NA	NA
Gentilello 1999	ED	Adult	Mixed	Medium	Yes	Yes	Treatment and mutual help[d]	No	Not tested	Yes	194	4.6%	215	4.7%
Kuchipudi 1990	Inpatient	Adult	High	High	Yes	No	Treatment only	No	Not tested	Yes	59	20.3%	55	16.4%
Monti 2007	Emergency department	Adult	Mixed	High	No	Yes	Not clear	No	Not tested	Yes	75	29.3%	80	20.0%
Monti 1999[ab]	Emergency department	Adolescent	Mixed	Medium	No	Yes	Not clear	No	Not tested	Yes	47	23.0%	37	18.0%
Saitz 2007*	In-patient	Adult	High	Medium	No	No	Treatment and mutual help[d]	No	Not tested	Yes	107	56.1%	105	56.2%
Wutzke 2002	Various	Adult	Low	High	No	Yes	Not clear	No	Not tested	No	NA	NA	NA	NA

*Two studies (Saitz 2007; Bischof 2008) were reclassified from mixed severity to high severity because outcome analyses were available for the subgroup of dependent drinkers. [a]Raw counts of the outcomes were deduced from percentages. [b]Significant outcomes at any time-point were coded as positive. [c]Study was not included in the main meta-analyses due to a high risk of bias, but was included in sensitivity analyses [d]Study analyzed treatment and mutual help both together and separately, but differences in findings were not apparent. We meta-analyzed treatment and mutual help together. NA = not available.

treatment initiation. The random-effects pooled risk ratio was RR = 1.08, 95% CI = 0.92–1.28 (see Fig. 2). The I^2 statistic was 0%, indicating no evidence of study heterogeneity. Pooled results of studies that isolated referral to treatment to one study arm ($n = 5$) did not achieve statistical significance (RR = 1.08, 95% CI = 0.81–1.43). Other subgroup analyses, which pooled results of multiple studies with similar characteristics (i.e. by age, setting, severity and treatment intensity), also yielded non-statistically significant risk ratios (e.g. RR = 1.08, 95% CI = 0.91–1.29 for adult studies, RR = 1.09, 95% CI = 0.54–2.21 for adolescent studies; RR = 1.04, 95% CI = 0.83–1.30) for high-severity studies; other subgroup-specific risk ratios not shown). Excluding studies that had a risk of bias in more than two areas of risk did not alter the results. Moreover, we note that including the study with a risk of bias in four of six domains, which was the only study that achieved statistical significance, also did not alter the results (e.g. pooled results for all 10 studies was RR = 1.22, 95% CI = 0.94–1.58). There were insufficient data (i.e. no identified studies) to meta-analyze whether or not alcohol-related outcomes improved as a result of referral to treatment.

DISCUSSION

The primary purpose of this study was to estimate the efficacy of brief alcohol interventions in linking people to higher levels of alcohol-related care. Based on a synthesis of 13 RCTs that met inclusionary requirements, which included pooled and subgroup-specific meta-analysis of nine RCTs, we found no evidence that brief alcohol interventions were effective in increasing the utilization of alcohol-related care. This lack of evidence calls into question the assumption that referral to treatment as part of SBI or SBIRT effectively links patients to higher levels of care for their alcohol problems.

Samples with higher alcohol severity and/or those recruited from more severe settings (e.g. in-patient medical settings) [33,54,55] tended have higher rates of service utilization than samples with lower alcohol severity and/or those recruited from general health-care settings [59–63,66]. It seems logical that baseline severity would be an important moderator of effects of referral to treatment interventions. For instance, it is likely that referral to a higher level of care would not be indicated for the majority of participants in studies that included hazardous and harmful drinkers but excluded dependent drinkers [57]. Given that SBI targets individuals with a broad range of alcohol severity, severity-stratified analyses and subgroup analyses [33,55] may be the most valid approach to evaluating the efficacy of referral to treatment. None the less, our subgroup-specific meta-analysis found that regardless of sample severity, brief interventions were not efficacious in increasing alcohol treatment utilization. In the subgroup of studies with samples that were deemed as high severity [33,54,55], only one of these studies isolated an active referral effort to the treatment group [54]. It is possible that, with more studies and greater power, we could have conducted a more thorough analysis of subgroup effects.

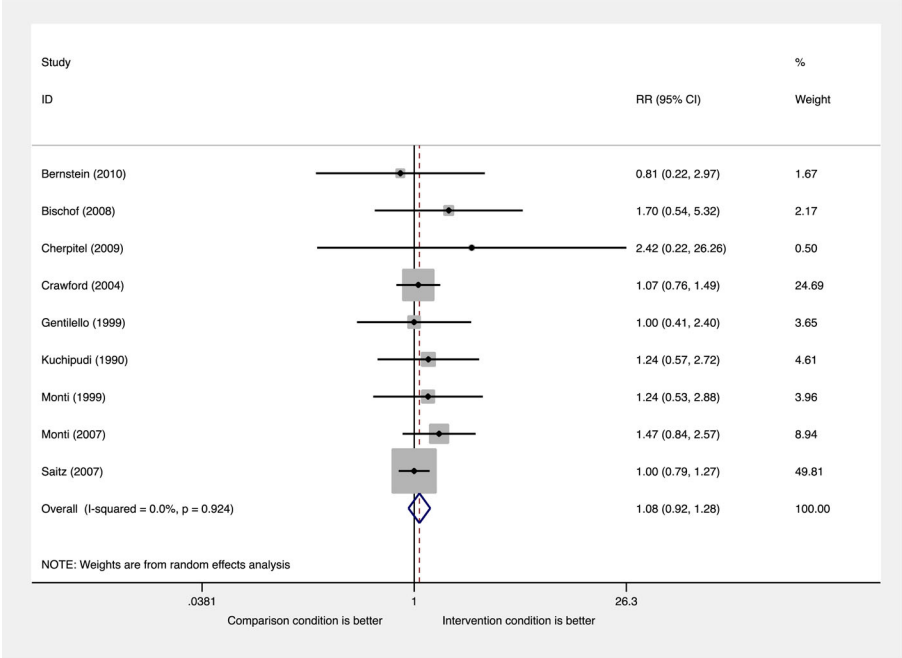

Figure 2 The forest plot contains risk ratios and confidence intervals for each study in the meta-analysis and a pooled risk ratio and confidence interval (depicted by the diamond) calculated with random effects. The areas of the squares are proportional to study weights in the meta-analysis

Although rates of specialty treatment utilization following brief intervention ranged from 2 to 56%, no studies analyzed an association between treatment utilization and clinical outcomes. Therefore, there was a lack of data to evaluate whether or not referral to and receipt of specialty alcohol treatment improved clinical outcomes among brief alcohol intervention recipients. Importantly, the diverse study characteristics with regard to sample severity and intervention content suggests that there is a need to develop and evaluate methods systematically for referring people with severe unhealthy alcohol use to higher levels of care. Particularly in general medical settings, individuals with less severe forms of unhealthy alcohol use are more common than those with more severe problems, including those with clinical alcohol use disorders. It is likely that clinicians who deliver brief interventions spend the majority of their time working with lower-severity individuals. Much has been written about how to provide brief interventions to lower-severity drinkers [21,67], but less guidance exists to inform the development of effective intervention materials focused on referring patients to specialty alcohol treatments. Indeed, many of the identified studies were limited in their description of referral processes [56–58,64,65], or simply provided lists of local alcohol treatment agencies to participants [59,62]. Qualitative data from one SBIRT study found that clinicians felt that they should not provide referrals to patients unless they were specifically requested due to the stigma associated with alcohol treatment [68]. Thus, it may be important to consider how provider factors, such as the perceived stigma of unhealthy alcohol use and its treatment [69], hinder brief intervention and treatment referral practices within medical settings [70,71]. While health-care professional groups have mandated or have discussed mandating SBIRT, it is important to have realistic expectations about the potential impact of these approaches within health systems.

In the identified studies, the majority of participants who received brief interventions did not subsequently attend alcohol treatment. As has been noted by prior reviews, this highlights the fact that it is difficult to encourage people to utilize alcohol treatment [30]. For instance, some have discussed the fact that specialty addictions treatment is not appealing to many individuals [72]. Even higher-intensity brief interventions may be insufficient for laying the foundation for subsequent treatment initiation when discussions do not address barriers to attending treatment, concerns about treatment efficacy and/or provide education about behavioral and pharmacological treatments offered in these settings [73]. Conceptual frameworks have characterized brief alcohol intervention and referral as a low-intensity approach to referring individuals to specialty care, and suggest that more intensive efforts (e.g. telephone monitoring, continued contact, case management) may be necessary to provide effective linkages [34]. In addition to improving interventions that link people in medical settings to alcohol treatment, the continued development and implementation of treatments for alcohol use disorders into general health-care settings, including alcohol pharmacotherapy [74], primary care–mental health integration [75] and chronic alcohol care management [76] will remain critical in order to meet the needs of individuals in medical settings with severe forms of unhealthy alcohol use. In addition, it would be worthwhile to evaluate whether specific subgroups of individuals benefit from new and existing efforts to increase the receipt of alcohol-related care. For instance, although their main effects were not statistically significant [33], one study found that brief intervention increased treatment utilization among women and adults below age 44 years [77].

Limitations

Our exclusion of non-English language papers may have resulted in us missing some important studies. Many RCTs of brief interventions have been conducted, but most do not assess treatment utilization and many exclude participants who would benefit from specialty care (e.g. those with DSM-IV dependence) [30]. Although there was no evidence for publication bias, our hand search to identify grey literature could have missed unpublished reports. However, RCTs with positive results tend to be published [78], thus it is unlikely that our findings would be substantively altered by unidentified unpublished research. There was significant heterogeneity across studies on important factors (e.g. age, treatment intensity), although the meta-analytical results did not change when analyzing subgroups of studies. Although the heterogeneity statistic calculated by the meta-analysis was acceptable, the estimated relative risk ratios should not be generalized to all settings and populations. Several of the included studies were limited in their descriptions of referral-specific components of the interventions provided in the treatment and control groups, which highlights a need for better reporting in clinical trials. While treatment utilization is a low-frequency outcome, only one of the included studies described a power analysis to detect this effect [33]. The assessment of alcohol-related care varied across studies, and in some studies was not described sufficiently to determine the types of care that were assessed.

Implications

Connecting individuals to higher levels of care is a theoretically important part of SBIRT programs to provide effective forms of treatment to people with severe alcohol problems [18,21]. Despite the widespread support for

SBIRT implementation as a public health program to address all forms of unhealthy alcohol use, there is a lack of evidence from existing studies of brief alcohol interventions to support the assumption that SBIRT, as currently implemented, is efficacious in linking individuals to higher levels of alcohol-related care. Given the importance of this aspect of SBIRT, one might question whether or not SBIRT currently addresses the full spectrum of unhealthy alcohol use. However, most existing RCTs have not been designed with the evaluation of the utilization of alcohol-related care as their primary focus, which suggests a need for more clinical trials with a primary focus on referral to treatment. Importantly, SBIRT has not been tested with more intensive linkage programs [79], which may be more effective with more severe patients. Future clinical trials should evaluate referral to treatment as a primary outcome, sufficiently explicate and track referral processes and consider the alcohol severity of the samples that are evaluated.

Declaration of interests

None.

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's web-site:

Appendix Table S1 Search keywords
Appendix Table S2 Reasons for exclusion during full-text review
Appendix Table S3 Components of the intervention and control groups of alcohol brief alcohol interventions assessing post-intervention treatment utilization (n=13)
Appendix Table S4 Elements of risk of bias in the included studies