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Brief interventions for illicit drug use among peripartum women

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Abstract

We review the evidence and identify limitations of the current literature on the effectiveness of brief interventions (≤5 intervention sessions) on illicit drug use, treatment enrollment/retention, and pregnancy outcomes among pregnant and postpartum women; and consider this evidence in the context of the broader brief intervention literature. Among 4 published studies identified via systematic review and meeting a priori quality criteria, we found limited, yet promising evidence of the benefit of brief interventions to reduce illicit drug use among postpartum women. Two of the 4 randomized controlled trials tested similar computer-delivered single-session interventions; both demonstrate effects on postpartum drug use. Neither of the 2 randomized controlled trials that assessed treatment use found differences between intervention and control groups. Studies examining brief interventions for smoking and alcohol use among pregnant women, and for illicit drug use in the general adult population, have shown small but statistically significant results of the effectiveness of such interventions. Larger studies, those that examine the effect of assessment alone on illicit drug use, and those that use technology-delivered brief interventions are needed to assess the effectiveness of brief interventions for drug use in the peripartum period.

Keywords

brief interventions; illicit drugs; postpartum; pregnant

Illicit drug use during pregnancy has been associated with a range of adverse neonatal outcomes, including intrauterine growth restriction, preterm birth and lower birthweight, neonatal abstinence syndrome, and neurocognitive delays and impairment.[1] Illicit drug use during the postpartum period is associated with increased risk of child neglect,[2] violence exposure,[3] physical abuse,[4] externalizing behavioral problems,[5] and substance use in adolescence.[6] Despite the frequency with which women reduce or quit drug use during pregnancy,[7] nationally representative data show that4.4% of pregnant women reported use of illicit drugs (marijuana/hashish, cocaine [including crack], heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically) in the past month.[8]

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Candidate treatments for illicit drug use during pregnancy and the post-partum period include counseling and specialized maintenance treatment for opioid dependence. However, over 50% of illicit drug users neither seek nor receive treatment,[8] making proactive identification necessary. Screening, brief intervention, and referral to treatment (SBIRT) is an evidence-based, proactive, and quick way for healthcare providers to identify, counsel, and refer patients to receive additional counseling and treatment for a behavioral health condition, usually substance abuse.

Among pregnant women, brief motivational interventions have been shown to modestly improve smoking cessation rates[9] and alcohol abstinence.[10] However, few studies have examined the effects of brief interventions for illicit drug use during pregnancy or the postpartum period. Therefore, we reviewed the available evidence and identified potential ways to improve future studies on the effectiveness of brief interventions on illicit drug use, treatment enrollment/retention, and pregnancy outcomes among pregnant and postpartum women.

Literature search

We searched the PubMed, Embase, and PsychInfo databases for research articles using keywords and MeSH terms associated with illicit drug use, related interventions, and pregnancy and postpartum. In 2001, the Institute of Medicine's Committee on the Quality of Health Care in America issued a call for screening for health risk behaviors, including substance use, in tandem with appropriate assessment and referral activities, and cited the SBIRT model as a promising practice.[11] Thus, we limited the search to articles published after the release of this Institute of Medicine report, between Jan. 1, 2002, and Sept. 20, 2013. We examined reference lists from the studies found and consulted with authors of peer-reviewed published papers on illicit drug use among pregnant and postpartum women to identify relevant articles published before 2002.

Eligibility criteria for this systematic review were based on intervention type, study population, design, and outcomes described below. In line with the substance abuse and mental health services administration definition, we defined brief interventions as consisting of 1–5 sessions lasting 5 minutes to 1 hour each, and excluded studies examining more intensive interventions. We included only studies examining brief interventions among pregnant women or women ≤1 year postpartum with the intended goal of reducing or abstaining from drug use, enrolling and retaining women in specialized drug treatment programs, and improving pregnancy and/or infant outcomes. We only included studies with a control group not offered the intervention during the study period.

One author (Y.L.H.) extracted data from the studies included in the review into a standardized Table and a second author (S.L.F.) checked the extracted data for accuracy. The authors assessed quality of each study by adapting a published set of criteria developed and piloted by the US preventive services task force.[12] A grade was given for research design (I = randomized controlled trials (RCTs); II-1 = well-designed controlled trial without randomization; and II-2 = well-designed cohort or case-control study) and internal validity (good, fair, or poor). For RCTs, internal validity was based on the 7 following criteria:

adequate randomization, low attrition and high adherence, low differential or total loss to follow-up, clear definition of intervention, high reliability and validity of exposure and outcome measures, important outcomes considered, and an intent-to-treat analysis. “Good” studies met ≥6 of the 7 criteria, “fair” studies met <6 of the criteria, but did not have a methodologic flaw that invalidated the study’s findings, and “poor” studies contained a methodologic flaw that invalidated the study’s findings.[12]

Our search found 3792 unique articles (Figure). Two authors (S.L.F. and Y.L.H.) reviewed titles and abstracts and determined that 114 articles were potentially eligible for inclusion in the review. Separately, both authors reviewed the 114 articles in full and agreed that 3 articles met all inclusion criteria. Three additional articles published before 2002 were found after reviewing reference lists of the 114 articles and consulting with experts in the field. Of the 3 additional articles, only 1 met all inclusion criteria. Therefore, a total of 4 articles (1 published before and 3 published after 2002) met our inclusion criteria and were included in this systematic review.

Brief interventions for illicit drug use among pregnant and postpartum women

We identified 4 RCTs published between 1996 and 2013 ranging in sample size from 71 to 179 women (Table 1).[13–16] One RCT recruited postpartum[14] women enrolled in outpatient treatment programs, and 3 RCTs enrolled pregnant[13] and postpartum women[15,16] through prenatal clinics or during their delivery hospitalizations. Outcomes examined included drug use and specialized treatment enrollment or retention; no studies examined pregnancy or infant outcomes (Table 2). Three studies were considered “good” quality,[14–16] and 1 was “fair” quality.[13]

Two “good” quality RCTs[10,11] were conducted to assess the effectiveness of a computerized single-session intervention for illicit drug use among postpartum women enrolled during their delivery hospitalization. Both RCTs used a brief computerized intervention administered via laptop or tablet computer and based on motivational interviewing techniques. The more recently published RCT, a replication of the 2007 study, enrolled at their delivery hospitalization 143 women who self-reported illicit drug use in the 3 months before pregnancy and met eligibility criteria. All women received a 30-minute assessment prerandomization. Based on self-reported illicit drug use before pregnancy, women were randomized to computerized brief intervention (n = 72) or an inactive control condition (n = 71). Intervention components included eliciting the participant’s thoughts and perceived advantages of change; providing normed feedback; and goal-setting. The 2 primary outcomes were 7-day point prevalence abstinence from illicit drugs based on self-report and negative toxicology screen at 3 and 6 months, and self-reported number of substance-using days in the last 90 days. At the 3-month follow-up, the authors found a statistically higher 7-day point-prevalence of abstinence in the intervention compared with the control arm(26.4% vs 9.9%; odds ratio [OR], 3.3; 95% confidence interval [CI], 1.3−8.4; P = .01); median number of substance-using days showed a positive trend(25.6 vs 51.4 days; P = .06), but was not significant. At the 6-month follow-up, neither the self-report of 7-day point prevalence in

the intervention and control groups (13.9% and 9.9%, respectively; OR, 1.5; 95% CI, 0.5−4.1) nor the median number of substance-using days (31.6 days and 77.2 days, respectively; $P = .21$) differed significantly. However, based on hair sample results, the intervention group had 4.8 times greater odds of drug abstinence at 6 months compared with the control group ($P = .02$).

In the initial and smaller of these 2 RCTs, also of "good" quality, the authors enrolled 107 postpartum women ≥18 years who self-reported illicit drug use in the month before pregnancy.[15] Women were randomized into assessment only (n = 52) or assessment plus brief intervention (n = 55) conditions. During their delivery hospitalization, all women completed a 45-minute assessment using a laptop with integrated touchscreen and headphones. Women in the assessment plus intervention arm also received a 20-minute, single-session, computer-based motivational intervention that elicited the participant's thoughts and perceived advantages of change, provided normed feedback, and offered goal-setting; this intervention and that from the more recent trial described previously differed moderately (eg, the more recent intervention referred specifically to the type of drug used, rather than only to "drugs" generically, and presented the content differently for those who reported being ready to change or having already done so). Outcomes assessed at 4 months postbaseline included drug abstinence and frequency of drug use measured by self-report using the Alcohol, Smoking, and Substance Involvement Screening Test questionnaire and a urine toxicology test. Women in the assessment plus intervention arm self-reported less use of any drugs combined ($P = .04$) and of drugs other than marijuana ($P = .03$), but effects on marijuana use alone failed to reach statistical significance. Group differences for dichotomized outcomes (either urine drug test results alone or toxicology-confirmed self-reports of no vs any use) in the intervention and control arms were of similar magnitude (abstinence from any drug: 33% and 16%, respectively; OR, 2.5; 95% CI,0.6−10.4) but were not statistically significant ($P = .09$).

In a "good" quality RCT conducted by Mullins et al,[14] the authors enrolled 71 women from a 12-month outpatient comprehensive treatment program. Women enrolled were 27-years-old on average, and varied by race/ethnicity and primary drug of use. Women randomly assigned to the motivational interviewing (MI) arm (n = 35) received 3 individual 1-hour MI sessions at baseline, at 1 week and 2 months postbaseline. Women in the control arm (n 36) watched educational videos on substance abuse at baseline and 1 week postbaseline, and received a 1-hour home visit focused on support and case management at 2 months postbaseline. The primary goal of the intervention was treatment retention and engagement in a comprehensive drug treatment program as measured by the proportion of group sessions attended. Drug use was also tested weekly at random using urine toxicology screens. Neither the mean proportion of group sessions attended ($P = .56$) nor the mean proportion of negative urine screens ($P = .55$) differed between the intervention and control arms.

The "fair" quality RCT conducted by Alemi et al[13] recruited 179 pregnant women in their third trimester who had used or were using cocaine during or immediately before pregnancy. Women ranged in age from 18 to 43 years, 92% were African American, and all were Medicaid recipients. Women were randomly assigned to either the intervention (n = 92) or control (n = 87) arm. The intervention consisted of computerized services accessed through

the participant's telephone, such as health education, access to pediatric and prenatal providers, patient testimonials, and weekly prayers to patients who self-selected to receive them. The authors did not examine the individual effects of separate components of the intervention. In addition, prenatal or pediatric nurses and drug counselors reviewed patients' records and used the voice mail service to proactively contact the patients about their care. The control group had similar access to drug treatment services, but not to computerized services; both groups received regular prenatal care. The primary outcomes assessed were drug treatment use and changes in drug and alcohol use measured by the addiction severity index between baseline and 6 months' postpartum. Specialized drug treatment use and changes in drug and alcohol use did not differ significantly by study arm. Both the control and intervention groups self-reported less drug and alcohol use from baseline to 6 months' postpartum, but between-group differences were not statistically significant. Therefore, addition of the computerized services did not improve rates of specialized drug treatment nor reduce drug and alcohol use more than access to drug treatment services alone.

Considerations in evaluating brief intervention trials

There is growing evidence that mere participation in a study and/or an extended baseline assessment may themselves act as a form of brief intervention. For instance, in a randomized trial of cognitive-behavioral therapy for alcohol-dependent women, Epstein et al[17] found that each pretreatment study procedure (eg, telephone screen, baseline evaluation) was associated with reductions in drinking, such that 44% of participants were abstinent before treatment began. Similarly, in a secondary analysis of data from an RCT among postpartum women,[18] Ondersma et al[19] showed that change in substance use after baseline assessment but before receiving the intervention was greater than the change in substance use following the intervention. Similar effects have been shown in other studies, including those randomly assigning participants to screening vs assessment only conditions.[20] The effect of assessment on illicit drug use must be more fully examined in future research. For example, 3-arm designs (screen only, screen+assessment, and screen+assessment+brief intervention) could be considered as a standard for brief intervention research.[21]

In addition, the small effects of brief interventions and the percentage of women who quit using substances spontaneously, also have implications for study power. An effect size of d = .20 (one-fifth of a standard deviation difference in the intervention and control groups), for example, may be large enough to justify implementation of brief interventions for drug use during pregnancy. Although observed effects in 2 trials reviewed here were negligible, Ondersma et al[15] failed to reach statistical significance for dichotomous urine toxicology-confirmed drug use despite effect sizes in the moderate range. Given this expectation of small effect sizes, larger RCTs are needed.

Potential benefits of technology-delivered interventions

Three of the 4 RCTs used technology-delivered interventions without therapist or counselor contact,[13,15,16] with 2 finding positive results.[15,16] A number of systematic reviews and metaanalyses of studies on nonpregnant adults suggest that these approaches have promise for reducing substance use.[22–24] For example, Moore et al[22] identified 11 randomized trials

of sufficient quality for inclusion in their review, and found that computer-delivered interventions led to greater knowledge, higher motivation, greater retention in treatment, and less drug use compared with treatment as usual. Two metaanalyses support these results.[23,24] Portnoy et al[23] found a mean effect size of d = .24 ($P < .001$) for computer-delivered interventions for reducing substance use (alcohol and/or other drugs) compared with various control conditions (eg, assessment only, education only, time-matched irrelevant interventions, or printed or face-to-face brief versions of the intervention). Rooke et al[24] found a statistically significant mean effect of d = 0.26 for computer-delivered in terventions for alcohol use compared with assessment only, placebo, and treatment-as-usual. Such findings suggest that computer-delivered brief interventions may be an important component of public health responses to substance abuse, particularly given substantial challenges in implementing person-delivered brief interventions.[25,26] More research is needed to understand how technology-delivered interventions perform among pregnant women.

Interventions among pregnant women

Evaluations of the Early Start program,[27–29] a brief intervention for substance use among prenatal care patients, showed positive results on drug abstinence, pregnancy outcomes, and cost savings, although the control groups included women who refused the intervention. Other investigators have examined interventions to increase specialized drug treatment or drug abstinence among pregnant women. For example, Winhusen et al[18] examined the effect of an MI intervention, which did not meet substance abuse and mental health services administration criteria for brief intervention, and showed no intervention effect on pregnant women's use of specialized drug treatment or self-reported drug use; however, subsequent analysis of the data showed marked pre-treatment change in both the intervention and control groups.[19] Another study showed no statistical difference in self-reported drug use by drug use support group attendance, yet found lower delivery costs for women attending the support group.[30]

Brief interventions for other substances and among other populations

A more extensive set of literature exists on brief interventions for smoking[9,31] and alcohol use[10] among pregnant women, as well as for drug use among the general adult population.[32] In a systematic literature review on smoking cessation interventions for pregnant women, brief MI resulted in a 5% reduction in smoking among pregnant women compared with treatment as usual and showed positive effects on birthweight and gestational age at birth.[9] Brief interventions for alcohol use among pregnant women, ranging from 10 minutes of brief counseling with self-help material to a 1-hour MI with reinforcement at prenatal care visits, improved alcohol abstinence during pregnancy; relative risks and odds ratios ranged from 1.1 to5.4, about half of which reached statistical significance.[10] Within the general adult population, when compared with no intervention, brief interventions have been effective in reducing drug and alcohol use for up to 12 months post-intervention, but show no effect after 12 months.[32] However, brief MI for drug use among the general adult population showed limited effectiveness or was no more effective when compared with assessment and feedback, treatment as usual, or other active interventions. It is unclear how

these findings translate to pregnant and postpartum illicit drug-using women, but the available evidence is promising.

Comment

We found 4 RCTs examining brief interventions for illicit drug use in pregnant and postpartum women.[13–16] Two RCTs using computerized brief interventions for drug use among post-partum women reduced drug use and increased abstinence among women who used illicit drugs before pregnancy. Effects across both studies were of similar magnitude (ranging from small to moderate, or one-fifth to one-half of a standard deviation difference in the intervention and control groups) and favored the intervention condition. However, for specialized treatment use, neither of the 2 RCTs examining brief interventions to increase rates of specialized treatment use found an effect.[14,15]

The brief interventions reviewed here differed with respect to the population of women (pregnant or postpartum), number of brief intervention sessions, mode of delivery, provider, venue and outcomes of interest, making comparisons and generalized statements on the effectiveness of brief interventions difficult. For example, participants in the Mullins et al[14] trial were recruited from a substance abuse treatment program, whereas Ondersma et al,[15] Ondersma et al,[16] and Alemi et al[13] recruited nontreatment seeking women from medical settings. There is some evidence that brief interventions can be helpful adjuncts to traditional treatment among adult populations, particularly as precursors designed to facilitate engagement.[33,34] However, their biggest potential public health impact may be among persons with unhealthy levels of substance use who do not seek treatment. Most brief intervention research involves proactively recruiting participants from health care settings. The Alemi et al,[13] Ondersma et al,[15] and Ondersma et al[16] trials are consistent with this model. In addition, the SBIRT model promoted by SAMHSA and others was not applied strictly in the studies reviewed here. The intervention used by Mullins et al[14] was largely informed by MI principles,[35] with greater interactivity and use of higher-level clinical skills than the SBIRT model. RCTs by Ondersma et al[15] were similarly informed by MI principles, but relied exclusively on technology. In contrast, Alemi et al[13] used a telephone-based combination of support, tailored messaging, and reminders.

In summary, 2 of the 4 studies identified that used a computerized brief intervention for postpartum women showed some evidence of the superiority of brief interventions for drug use reduction or abstinence compared to assessment alone or treatment as usual, although effects waned over time. The larger body of evidence on brief interventions for smoking and alcohol use among pregnant women, and for illicit drug use in the general adult population, are promising. Even with small, short-lived effects experienced during the prenatal and postpartum period, brief interventions for pregnant and post-partum women may result in improved maternal and infant outcomes. Larger studies, those that examine the effect of assessment alone on illicit drug use, and those that use technology-delivered brief interventions are needed to assess the effectiveness of brief interventions for drug use in the peripartum period.■

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REFERENCES

1. Shankaran S, Lester BM, et al. Impact of maternal substance use during pregnancy on childhood outcome. Semin Fetal Neonatal Med 2007;12:143–50. [PubMed: 17317350]
2. Onigu-Otite EC, Belcher HM. Maternal drug abuse history, maltreatment, and functioning in a clinical sample of urban children. Child Abuse Negl 2012;36:491–7. [PubMed: 22749611]
3. Ondersma SJ, Delaney-Black V, Covington CY, Nordstrom B, Sokol RJ. The association between caregiver substance abuse and self-reported violence exposure among young urban children. J Trauma Stress 2006;19: 107–18. [PubMed: 16568455]
4. Chaffin M, Kelleher K, Hollenberg J. Onset of physical abuse and neglect: psychiatric, substance abuse, and social risk factors from prospective community data. Child Abuse Negl 1996;20:191–203. [PubMed: 8734549]
5. Manly JT, Oshri A, Lynch M, Herzog M, Wortel S. Child neglect and the development of externalizing behavior problems: associations with maternal drug dependence and neighborhood crime. Child Maltreat 2013;18: 17–29. [PubMed: 23136210]
6. Yule AM, Wilens TE, Martelon MK, Simon A, Biederman J. Does exposure to parental substance use disorders increase substance use disorder risk in offspring? a 5-year follow-up study. Am J Addict 2013;22: 460–5. [PubMed: 23952891]
7. Substance Abuse and Mental Health Services Administration. The National Survey of Drug Use and Health Report: substance use among women during pregnancy and after childbirth. 5-21-2009 Rockville, MD.
8. Substance Abuse and Mental Health Services Administration. Results from the 2010 National Survey on drug use and health: summary of national findings Substance Abuse and Mental Health Services Administration, ed. National Survey of Drug Use and Health Series H-41, HHS Publication no. (SMA) 11–4658 Rockville, MD; 2011.
9. Lumley J, Chamberlain C, Dowswell T, Oliver S, Oakley L, Watson L. Interventions for promoting smoking cessation during pregnancy. Cochrane Database Syst Rev 2009: CD001055. [PubMed: 19588322]
10. Stade BC, Bailey C, Dzendoletas D, Sgro M, Dowswell T, Bennett D. Psychological and/or educational interventions for reducing alcohol consumption in pregnant women and women planning pregnancy. Cochrane Database Syst Rev 2009:CD004228. [PubMed: 19370597]
11. Committee on Quality of Health Care in America Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy Press; 2001.
12. Harris RP, Helfand M, Woolf SH, et al. Current methods of the US Preventive Services Task Force: a review of the process. Am J Prev Med 2001;20(Suppl):21–35.
13. Alemi F, Stephens RC, Javalghi RG, Dyches H, Butts J, Ghadiri A. A randomized trial of a telecommunications network for pregnant women who use cocaine. Med Care 1996;34(Suppl):OS10–20. [PubMed: 8843933]
14. Mullins SM, Suarez M, Ondersma SJ, Page MC. The impact of motivational interviewing on substance abuse treatment retention: a randomized control trial of women involved with child welfare. J Subst Abuse Treat 2004;27: 51–8. [PubMed: 15223094]
15. Ondersma SJ, Svikis DS, Schuster CR. Computer-based brief intervention a randomized trial with postpartum women. Am J Prev Med 2007;32:231–8. [PubMed: 17236741]
16. Ondersma SJ, Svikis DS, Thacker LR, Beatty JR, Lockhart N. Computer-delivered screening and brief intervention (e-SBI) for postpartum drug use: a randomized trial. J Subst Abuse Treat 2014;46:52–9. [PubMed: 24051077]
17. Epstein EE, Drapkin ML, Yusko DA, Cook SM, McCrady BS, Jensen NK. Is alcohol assessment therapeutic? pre-treatment change in drinking among alcohol-dependent women. J Stud Alcohol 2005;66: 369–78. [PubMed: 16047526]

18. Winhusen T, Kropp F, Babcock D, et al. Motivational enhancement therapy to improve treatment utilization and outcome in pregnant substance users. J Subst Abuse Treat 2008;35: 161–73. [PubMed: 18083322]
19. Ondersma SJ, Winhusen T, Lewis DF. Pre-treatment change in a randomized trial with pregnant substance-abusing women in community-based outpatient treatment. Contemp Clin Trials 2012;33:1074–9. [PubMed: 22710564]
20. McCambridge J, Kypri K. Can simply answering research questions change behaviour? systematic review and meta analyses of brief alcohol intervention trials. PLoS One 2011;6:e23748. [PubMed: 21998626]
21. Donovan DM, Bogenschutz MP, Perl H, et al. Study design to examine the potential role of assessment reactivity in the Screening, Motivational Assessment, Referral, and Treatment in Emergency Departments (SMART-ED) protocol. Addict Sci Clin Pract 2012;7:16. [PubMed: 23186329]
22. Moore BA, Fazzino T, Garnet B, Cutter CJ, Barry DT. Computer-based interventions for drug use disorders: a systematic review. J Subst Abuse Treat 2011;40:215–23. [PubMed: 21185683]
23. Portnoy DB, Scott-Sheldon LA, Johnson BT, Carey MP. Computer-delivered interventions for health promotion and behavioral risk reduction: a meta-analysis of 75 randomized controlled trials, 1988–2007. Prev Med 2008;47:3–16. [PubMed: 18403003]
24. Rooke S, Thorsteinsson E, Karpin A, Copeland J, Allsop D. Computer-delivered interventions for alcohol and tobacco use: a meta-analysis. Addiction 2010;105:1381–90. [PubMed: 20528806]
25. Beich A, Gannik D, Malterud K. Screening and brief intervention for excessive alcohol use: qualitative interview study of the experiences of general practitioners. BMJ 2002;325:870. [PubMed: 12386040]
26. Okoli CT, Greaves L, Bottorff JL, Marcellus LM. Health care providers' engagement in smoking cessation with pregnant smokers. J Obstet Gynecol Neonatal Nurs 2010;39:64–77.
27. Armstrong MA, Gonzales Osejo V, Lieberman L, Carpenter DM, Pantoja PM, Escobar GJ. Perinatal substance abuse intervention in obstetric clinics decreases adverse neonatal outcomes. J Perinatol 2003;23:3–9. [PubMed: 12556919]
28. Goler NC, Armstrong MA, Taillac CJ, Osejo VM. Substance abuse treatment linked with prenatal visits improves perinatal outcomes: a new standard. J Perinatol 2008;28: 597–603. [PubMed: 18580882]
29. Goler NC, Armstrong MA, Osejo VM, Hung YY, Haimowitz M, Caughey AB. Early start: a cost-beneficial perinatal substance abuse program. Obstet Gynecol 2012;119: 102–10. [PubMed: 22183217]
30. Svikis D, McCaul M, Feng T, Stuart M, Fox M, Stokes E. Drug dependence during pregnancy: effect of an on-site support group. J Reprod Med 1998;43:799–805. [PubMed: 9777620]
31. Fiore MC, Jaen CR, Baker TB, et al. A clinical practice guideline for treating tobacco use and dependence: 2008 update - a us public health service report. Am J Prevent Med 2008;35: 158–76.
32. Smedslund G, Berg RC, Hammerstrom KT, et al. Motivational interviewing for substance abuse. Cochrane Database Syst Rev 2011: CD008063. [PubMed: 21563163]
33. Burke BL, Arkowitz H, Menchola M. The efficacy of motivational interviewing: a meta-analysis of controlled clinical trials. J Consult Clin Psychol 2003;71: 843–61. [PubMed: 14516234]
34. Carroll KM, Ball SA, Nich C, et al. Motivational interviewing to improve treatment engagement and outcome in individuals seeking treatment for substance abuse: a multisite effectiveness study. Drug Alcohol Depend 2006;81:301–12. [PubMed: 16169159]
35. Miller WR, Rollnick S. Motivational interviewing: preparing people for change, 2nd ed. New York: Guilford; 2002.

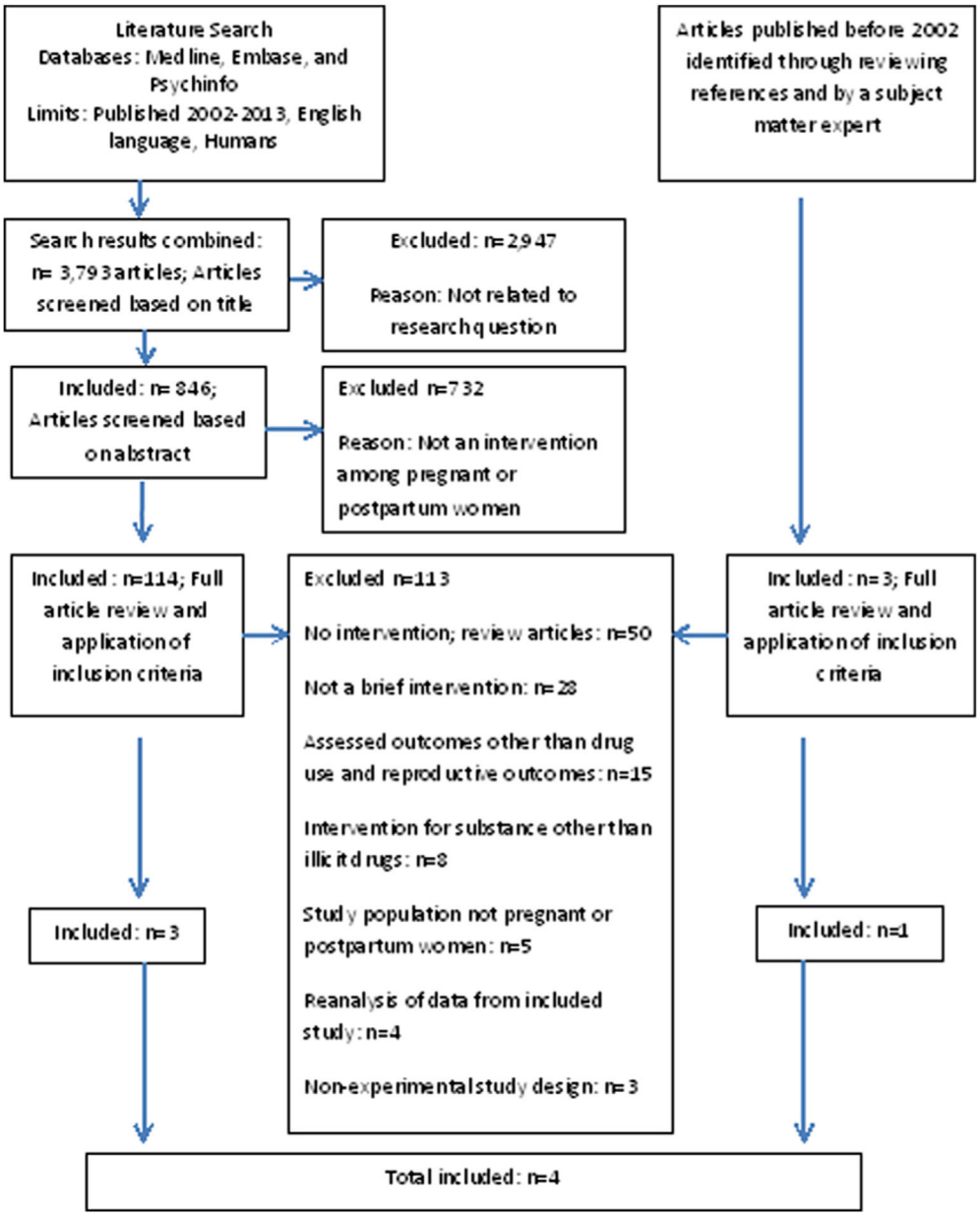

FIGURE.
Published articles identified, reviewed and included in review.

TABLE 1

Study characteristics of randomized controlled trials on brief interventions for drug use among pregnant and postpartum women

Author, publication year study quality[a]	Study setting	Sample size and eligibility criteria	Randomization procedure	Intervention
Ondersma et al, 2013[16] I-Good	3 Detroit area obstetric hospitals	N = 143 postpartum women (n = 72 intervention; n = 71 control) Eligibility criteria: postpartum, ≥18 y, having slept since giving birth, self-reporting of any illicit drug use in the month before pregnancy, no cognitive impairment or recent administration of prescription pain medication	Computer-based randomization stratified by participants' self-reported type of substance use in the 3 mo before pregnancy; research assistant blinded to randomization.	Intervention: computer-delivered 30-min assessment followed by a computer-delivered 20-min postpartum intervention using MI principles. Control: 30-min computer-delivered assessment prerandomization followed by a 20-min inactive control condition.
Ondersma et al, 2007[15] I-Good	Obstetric hospital in Detroit, MI	N = 107 postpartum women (n = 55 intervention; n = 52 control) Eligibility criteria: postpartum, ≥18 y, slept since giving birth, infant not in NICU, no recent administration of narcotic for pain, self-reported illicit drug use in month before pregnancy,	Computer-based randomization without stratification; research assistant blinded to randomization.	Intervention: 45-min assessment and a 20-min, single-session, computer-based motivational intervention. Participants asked to attend a treatment intake/substance abuse evaluation. Participants mailed brochures at 4 and 9 wk postintervention on making or maintaining behavior change. Control: 45-min assessment session only
Mullins et al, 2004[14] I-Good	12-month outpatient comprehensive treatment facility in a Midwestern city	N = 71 postpartum women (n = 35 intervention; n = 36 control) Eligibility criteria: postpartum, ≥18 y, used drugs while pregnant, no significant obvious impairment that would interfere with study participation	Stratified randomization based on ethnicity and drug of choice	Intervention: 3 individual 1-hr MI sessions at intake, 1 wk and 2 mo after intake. The intervention consisted of discussing client-elicited concerns and goals related to motivation and behavior change using the MI principles. Control: at intake and at 1 wk postintake, 30-min educational videos pertaining to substance abuse and its effects on families. At 2 mo postintake, supplementary 60-min home visit.
Alemietal, 1996[13] I-Fair	Hospitals in Ohio	N = 179 pregnant women (n = 92 intervention; n = 87 control) Eligibility criteria: pregnant, self-reported use of cocaine during pregnancy or 1 mo before seeking prenatal care	Random assignment	Intervention: computer services accessed through a touch-tone phone to inform and motivate patients to participate in treatment. Control: treatment as usual

MI, motivational interviewing; NICU, neonatal intensive care unit.

[a]Studies were given a grade for research design (I = randomized controlled trials [RCT]; II-1 = well-designed controlled trial without randomization; and II-2 = well designed cohort or case-control study) and a separate grade for internal validity (good, fair, or poor).

TABLE 2

Outcomes and results of studies on brief interventions for drug use among pregnant and postpartum women

Author, year	Outcomes and timing of assessment	Results
Ondersma et al, 2013[16]	Primary: (1) 7-d point prevalence abstinence at 3- and 6-mo postintervention per self-report and urine toxicology tests for cocaine, amphetamines, marijuana and opiates; and (2) Self-reported substance-using days in the past 90 d Secondary: (1) Changes in ASSIST (2) Hair toxicology tests for 90-d drug abstinence at 6-mo follow-up.	At the 3-mo follow-up evaluation, 26.4% of women in the intervention group abstinent over the past 7 d compared with 9.9% of control group participants (χ^2 *P* value = .01; OR, 3.3). At the 6-mo follow-up, 7-d abstinence rates were 13.9% in the intervention group and to 9.9% in the control group (χ^2 *P*value = .45; OR, 1.5). At 3 mo, the intervention group reported a median of 25.6 substance-using days in the past 90 d compared with a median of 51.4 substance-using days for the control group (*P*= .06). At 6-mo, the intervention group reported a median of 31.6 substance-using days compared with 77.2 d in the control group (*P*= .21). At 3- and 6-mo, ASSIST subscale scores did not differ between groups. Of the 76 women providing hair samples, 28.9% from the intervention group were negative for all drugs compared with 7.9% from the control group (χ^2 *P*value = .02; OR, 4.8).
Ondersma et al, 2007[15]	Primary: changes in frequency and point prevalence of drug use measured by ASSIST and urine toxicology test at 4-mo postintervention.	No significant difference between groups in proportion of women using drugs at 4-mo follow-up (per self-report and/or urinalysis), but trends favored the intervention group (ORs 1.4 to 4.7). Analyses using urine toxicology data only found similar results.
Mullins et al, 2004[14]	Primary: treatment retention and engagement in a treatment program. Secondary: proportion of group sessions attended over 8 wks; proportion of negative drug screens.	Attendance at sessions 2 and 3 was equivalent across treatment conditions. The mean number of sessions attended was 2.09 (SD = 0.74) for intervention group and 2.19 (SD = 0.82) for the control group (*P* = .56). The mean proportion of negative urine screens was 0.51 (SD = 0.40) for the intervention group and 0.45 (SD = 0.36) for the control group (*P* = .55).
Alemi et al, 1996[13]	Primary: self-reported participation in formal treatment, number of self-care meetings attended, and drug and alcohol abstinence measured by Addiction Severity Index at 6-mo postpartum.	No significant difference between groups in formal treatment use, attendance at self-care meetings, or self-reported drug and alcohol use (*P* > .05 for all).

ASSIST, Alcohol, Smoking, and Substance Involvement Screening Test; *OR*, odds ratio; *SD*, standard deviation.