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Single-session motivational intervention to decrease alcohol use during pregnancy

Robin L. Osterman, Ph.D., R.N.C.-O.B., P.M.H.C.N.S.-B.C. [a,*], Adam C. Carle, M.A., Ph.D. [b], Robert T. Ammerman, Ph.D. [b], Donna Gates, Ed.D., R.N. [a]

[a] University of Cincinnati College of Nursing, Cincinnati, OH 45221, USA
[b] Cincinnati Children's Hospital Medical Center and University of Cincinnati College of Medicine, Cincinnati, OH 45229, USA

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ABSTRACT

This randomized clinical trial tested the effectiveness of a single-session of motivational interviewing (MI) to decrease alcohol use during pregnancy, while examining theory-based mechanisms of the intervention. Eligible pregnant women who drank any amount of alcohol in the previous year ($n = 122$) were randomized to an intervention or comparison group. Drinking behaviors, basic psychological need satisfaction, and autonomous motivation to decrease prenatal alcohol use were measured at baseline, 30 day postbaseline, and 30 day postpartum follow-ups. Poisson and linear regression with generalized estimating equations were used to evaluate treatment effects over time. Although MI was not found effective in decreasing alcohol use, low levels of reported alcohol use by the women at baseline left little room for improvement due to the intervention. To prevent fetal alcohol spectrum disorders, future studies will use self-report and biomarkers to more accurately identify women in need of interventions to reduce their risk of alcohol-exposed pregnancies.

1. Introduction

Intrauterine alcohol exposure may result in fetal alcohol spectrum disorders (FASD) (Floyd, O'Connor, Sokol, Bertrand, & Cordero, 2005; Hoyme et al., 2005; Manning & Hoyme, 2007; Stratton, Howe, & Battaglia, 1996), a leading cause of mental retardation, birth defects and neurodevelopmental disabilities in prenatally exposed children. Although 2–5% of all US live births are affected by FASD (May et al., 2009), pregnant women continue to consume alcohol in amounts risky to the developing fetus with recent prevalence of 7.6 % of pregnant women reporting any alcohol use and 1.4% reporting binge drinking (consuming four or more standard drinks on an occasion) in the previous 30 days (Marchetta et al., 2012). When considering the entire gestational period of 40 weeks, up to 35% of pregnant women consume alcohol at some time during pregnancy (Bobo, Klepinger, & Dong, 2006). With harmful effects of prenatal alcohol exposure found with as little as one drink per week (Sood et al., 2001), the US Surgeon General has advised women to abstain from all alcohol use while pregnant (US DHHS, 2005). Interventions to decrease alcohol consumption before, during, and after pregnancy have been successful in reducing alcohol-exposed pregnancies (AEP), with varying doses and ingredients used (Chang et al., 2005; Fleming, Lund, Wilton, Landry, & Scheets, 2008; Floyd et al., 2007; Handmaker, Miller, & Manicke, 1999; Manwell, Fleming, Mundt, Stauffacher, & Barry, 2000; O'Conner & Whaley, 2007; The Project CHOICES Intervention Research Group, 2003). Yet the specific mechanisms of these interventions most helpful in assisting pregnant women to decrease or abstain from alcohol use have eluded researchers. The National Institutes of Health strongly recommended testing specific theory-based mechanisms of behavioral change and their role as mediators for future development of individually tailored interventions to assist with behavior change (NIH, 2009). Theory-based interventions that assist pregnant women to decrease alcohol consumption have great potential to prevent FASD.

1.1. Consequences of alcohol use during pregnancy

A diagnosis of FASD encompasses a variety of physical, neurological, behavioral, and psychosocial abnormalities which can be categorized according to severity of outcomes for the alcohol-exposed fetus (Floyd et al., 2005; Hoyme et al., 2005; Manning & Hoyme, 2007; Stratton et al., 1996). Fetal alcohol syndrome (FAS), the most severe form of FASD, occurs in 2 to 7 of 1,000 live births (May et al., 2009). Diagnostic characteristics of FAS include all of the following: facial dysmorphology, growth retardation, and central nervous system abnormalities. Less severe but more frequently occurring are partial FAS, alcohol-related birth defects (ARBD), and alcohol-related neurodevelopmental disorders (ARND) which involve combinations of birth defects, central nervous system malformations, growth retardation, and behavioral/cognitive dysfunctions that may be difficult to diagnose before children are school-age and beyond.

* Corresponding author at: College of Nursing, University of Cincinnati Academic Health Center, PO Box 210038, Cincinnati, OH 45221–0038, USA. Tel.: +1 513 558 5718; fax: +1 513 558 2142.
E-mail address: robin.osterman@uc.edu (R.L. Osterman).

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The rise in prevalence rates of FASD from 1% (May & Gossage, 2001) to 2–5% (May et al., 2009) is representative of neurobehavioral complications of intrauterine alcohol exposure identified more recently with case ascertainment methods of assessing school-age children. The implications of FASD continue throughout the lifespan and are demonstrated in lower IQ scores (Streissguth, 2007), delinquent/aggressive and anxious/depressed behaviors (Sood et al., 2001), psychiatric and substance use diagnoses, inappropriate sexual behaviors, problems in school, and trouble with the legal system (Streissguth, 2007; Streissguth et al., 2004). The economic societal burden of FAS alone is $2 million per affected child (Lupton, Burd, & Harwood, 2004), but is underestimated due to underdiagnosed cases of FAS and FASD related to practitioner inexperience and lack of knowledge (Stratton et al., 1996).

1.2. Interventions to decrease prenatal alcohol use

FASD can be prevented by women not drinking alcohol while pregnant (US DHHS, 2005). But with rates of identified FASD at 2–5 percent in the U.S. (May et al., 2009), effective interventions that assist pregnant women to decrease prenatal alcohol use are essential to prevent the serious sequelae of intrauterine alcohol exposure. Interventions of varied types, dosages, and ingredients have shown promising results with higher level drinking women during the preconception and postpartum periods. The Project TrEAT (Trial for Early Alcohol Treatment) (Manwell et al., 2000) found two 15-minute physician-provided brief interventions with follow-up phone calls to significantly decrease alcohol use in childbearing age problem drinkers, as well as in the women who became pregnant during the 48 month follow-up when compared to a control group. When the Project TrEAT protocols were modified for use with postpartum women, decreased alcohol use behaviors in postpartum high-risk drinkers were found over a 6 month period (Fleming et al., 2008). The Project Choices (Floyd et al., 2007) provided a series of four motivational interviewing (MI) intervention sessions and one contraceptive counseling session to women at risk for an AEP due to problem drinking, ineffective use of contraception, or both. Women receiving the intervention had two times the odds of reduced risk for AEP at 9 month follow-up by reducing drinking behaviors and through more effective use of contraception over a control group.

Outcomes of interventions provided during pregnancy to decrease prenatal alcohol use have varied depending on the dosage of the intervention. A series of brief interventions provided to women who reported alcohol use at monthly prenatal visits found those receiving the interventions were 5 times more likely to abstain from alcohol use, had infants with higher birth weights and lengths, and had infants with 3 times lower fetal mortality rates (O'Conner & Whaley, 2007). Yet Chang et al.'s (2005) study of a single-session brief intervention to decrease prenatal alcohol use found no differences in drinking behaviors between pregnant women who received the intervention and those who did not, although women who drank at higher levels at baseline demonstrated significantly reduced alcohol use at postpartum follow-up. Provision of a single-session MI intervention by Handmaker et al. (1999) found results similar to Chang et al. (2005), with only higher level drinkers having greater decreases in blood alcohol concentrations at 2 month follow-up than a control group.

Yet the mechanisms that evoked changes in drinking behaviors in these previous studies remain unknown. In response to the NIH's (2009) charge to test theory-based mechanisms of behavior change in development of interventions, a preliminary study by Osterman and Dyehouse (2012) determined the effectiveness of a single-session MI intervention to decrease prenatal alcohol use, while examining theory-based mechanisms of the intervention which may have evoked behavior change. Self-determination theory (SDT; Deci & Ryan, 1985, 2000; Ryan & Deci, 2000, 2002) concepts of basic psychological need satisfaction and autonomous motivations to change behavior were investigated to determine mechanisms of MI helpful in reducing prenatal alcohol use. Although MI was not found effective in decreasing prenatal alcohol use in this study (Osterman & Dyehouse, 2012), this preliminary work provided information essential in development of the current study to test the effectiveness of an SDT-based MI intervention to decrease prenatal alcohol use. A description of the theoretical framework that undergirded the MI intervention in both studies follows.

1.3. An SDT-based MI intervention to decrease prenatal alcohol use

The method used to assist pregnant women in decreasing prenatal alcohol use in Osterman and Dyehouse's (2012) preliminary study and the current study was motivational interviewing (Miller & Rollnick, 2002, 2013). Motivational interviewing (MI) is a person-centered, directive counseling style which increases a person's intrinsic motivation for change through the MI *spirit* of partnership, acceptance, compassion, and evocation. Four principles guide MI - establishing empathy, developing discrepancy, rolling with resistance, and supporting self-efficacy. Acceptance and compassion for a person as competent and capable of making decisions in his/her best interest establishes the foundation of an empathic relationship. Reflective statements, open-ended questions, and linking summaries assist with exploration of discrepancies between a person's beliefs, values, and current behaviors. Resistance is seen as a sign of evolving self-awareness of concerns and ambivalence for behavior change, at which time potential options and opportunities for change can be evoked. Self-efficacy develops as the client is supported in autonomous, competent decisions through collaborative goal setting and commitment for change. MI has facilitated improvements in health behaviors (Burke, Arkowitz, & Menchola, 2003; Hettema, Steele, & Miller, 2005), such as risky alcohol use (Burke et al., 2003), with non-pregnant women at risk for alcohol-exposed pregnancies (Floyd et al., 2007; The Project CHOICES Intervention Research Group, 2003), and with pregnant women who drink (Handmaker et al., 1999). Yet due to MI's atheoretical development in clinical practice (Miller, 1999), a theoretical framework is needed to understand the processes and efficacy of MI.

Self-determination theory (SDT; Deci & Ryan, 1985, 2000; Ryan & Deci, 2000, 2002) provides a framework which can increase understanding of the mechanisms of MI (Markland, Ryan, Tobin, & Rollnick, 2005; Vansteenkiste & Sheldon, 2006) that may assist pregnant women in reducing their alcohol use. The theory postulates that motivation to perform a behavior increases when three basic psychological needs are satisfied – the need for autonomy, the need for competence, and the need for relatedness. The more these needs are satisfied, the more intrinsically motivated a person is to engage in a behavior. Although intrinsically motivated behaviors are chosen willingly and for self-satisfaction, other behaviors are performed due to motivators external to a person. Rewards, punishments, and guilt may motivate behavior, yet the outcome may be short-lived due to lack of autonomy in choosing the behavior. External motivators that identify or integrate with a person's values and beliefs are more sustained due to more autonomous choice and satisfaction of a person's need for autonomy, competence, and relatedness. External social environments which provide autonomy support, structure, and involvement can satisfy a person's basic psychological needs leading to autonomous motivations to engage in behaviors. Motivational interviewing can provide such an external social environment through an empathic relationship that promotes self-awareness of discrepancies in beliefs, values, and behaviors and supports autonomous, competent decision-making to engage in healthier behaviors. An MI intervention grounded in SDT which satisfies a pregnant woman's basic psychological needs has the potential to increase motivation to decrease prenatal alcohol use.