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# Reducing the Risk of Alcohol-Exposed Pregnancies: A Study of a Motivational Intervention in Community Settings

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# Reducing the Risk of Alcohol-Exposed Pregnancies: A Study of a Motivational Intervention in Community Settings

The Project CHOICES Intervention Research Group*

**ABSTRACT.** *Objectives.* **To test the feasibility and impact of a motivational intervention in reducing drinking and/or increasing effective contraception in women who are at risk for an alcohol-exposed pregnancy.**

*Methods.* **A multisite single-arm pilot study was conducted in 6 community settings in 3 large cities. A total of 2384 women were screened for eligibility; 230 were eligible on the basis of their alcohol use and lack of contraception. Of the eligible women, 190 consented and were enrolled, and 143 (75.3%) completed the 6-month follow-up. The intervention consisted of 4 manual-guided motivational counseling sessions delivered by mental health clinicians and 1 contraceptive counseling session delivered by a family planning clinician. Outcome measures include intervention completion rates, alcohol use (frequency, quantity, and bingeing), contraceptive use and effectiveness, and risk for alcohol-exposed pregnancy.**

*Results.* **Among women who completed the 6-month follow-up, 68.5% were no longer at risk of having an alcohol-exposed pregnancy; 12.6% of women who completed the program reduced drinking only; 23.1% used effective contraception only; and 32.9% reported both. Results were consistent across the 6 diverse high-risk settings.**

*Conclusions.* **This study provides evidence that providing 4 sessions of motivational interviewing plus a contraception counseling session is feasible and strongly suggests that this intervention can decrease the risk of alcohol-exposed pregnancy in women in high-risk settings. Additional investigation in a randomized controlled trial is warranted.** ***Pediatrics*** **2003;111:1131–1135;** ***fetal alcohol syndrome, motivational interviewing, alcohol-related disorders, alcohol, pregnancy, mental health, women's health.***

ABBREVIATIONS. FAS, fetal alcohol syndrome; ARND, alcohol-related neurodevelopmental disorder; MI, motivational interviewing; AEP, alcohol-exposed pregnancy; AUDIT, Alcohol Use Disorders Identification Test; BSCQ, Brief Situational Confidence Questionnaire; BSCQ-T, Brief Situational Confidence Questionnaire-Temptation.

Prenatal alcohol exposure is one of the leading preventable causes of birth defects, mental retardation, and neurodevelopmental disorders[1] and has been identified as a health care priority by both the US Department of Health and Human Services *Healthy People 2010* goals[2] and the Institute of Medicine.[3] The effects of prenatal alcohol exposure on a fetus can vary from subtle to profound, with fetal alcohol syndrome (FAS) and perinatal death constituting the most severe outcomes. Additional effects include major and minor malformations and a wide range of behavioral and cognitive deficits.[4] Reported rates of alcohol use among pregnant women vary from 15% to 35%.[5,6] Despite survey results documenting that most childbearing-age women are aware of the adverse effects of prenatal alcohol use,[7] a Centers for Disease Control and Prevention study found substantial increases in alcohol use among pregnant women from 1991–1995.[8]

FAS occurs in infants who are born to women who engage in heavy prenatal alcohol consumption.[9] In addition, alcohol-related neurodevelopmental disorder (ARND), defined as cognitive and behavioral disorders in children who do not have identifiable malformations, may occur at lower levels of drinking than are associated with FAS. For example, drinking as few as 8 drinks per week on average or 5 or more drinks on a single occasion may constitute risk levels for ARND, which may include problems focusing and sustaining attention, in working memory, and in executive function.[10]

Although many women significantly reduce their alcohol use once they know they are pregnant, a large proportion do not realize that they are pregnant until well into the first trimester, a critical period of fetal susceptibility to alcohol. To avoid FAS and ARND, it is critical to intervene with women before conception to help them reduce risk drinking and/or improve contraception.

Because women may be unlikely to perceive themselves as being at risk, the intervention for this study was based on motivational interviewing (MI). This counseling style guides the individual to explore and resolve ambivalence about changing while highlighting and increasing perceived discrepancy between current behaviors and overall goals and values. Another aim is to minimize clients' resistance to the intervention. Counselors who use MI express empathy, manage resistance without confrontation, and support the self-efficacy of the individual, using techniques such as open-ended questioning, reflective listening, summarizing, and affirming.[11] Studies have supported the efficacy of MI to reduce drinking and enhance treatment engagement among problem and dependent drinkers in many settings, including pregnant drinkers.[12,13] However, studies of its im-

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pact on contraceptive efficacy are lacking, as are studies of its use to target >1 behavior at a time. The purpose of Project CHOICES was to test the feasibility and effectiveness of MI in reducing drinking and increasing contraception in women at risk for an alcohol-exposed pregnancy (AEP) in multiple and diverse settings as a prerequisite to conducting randomized clinical trials.

## METHODS

Women who were at risk for an alcohol-exposed pregnancy and consented to participate were screened for the severity of their drinking using the Alcohol Use Disorders Identification Test (AUDIT).[14] We also assessed temptation to drink and confidence to abstain from drinking using an adapted Brief Situational Confidence Questionnaire (BSCQ-T, BSCQ),[15] contraceptive use, attitudes about contraception, and gynecological and obstetrical history. For assessing effective use of contraception, women who reported using contraception were shown a card detailing effective use of their particular method.[16] Ineffective use was defined as any that deviated from published guidelines for that method. The outcome of interest was risk status at 6 months. As possible predictors of 6-month risk status, we also examined variables identified in a prestudy survey.[17] These included AUDIT score, demographic characteristics, previous alcohol or drug or mental health treatment, and current smoking. Level of participation in the intervention was also examined as a possible predictor. All participants were assessed in-person using a full battery of measures at baseline and at 6 months posttreatment. A short telephone interview was conducted at 3 months posttreatment.

### Sites and Inclusion Criteria

Six community-based special settings with high proportions of women at risk for an AEP were selected for geographic and sample diversity. Women were recruited in a primary care practice in a large suburban area and through the media in the Ft. Lauderdale, Florida, area; a large urban jail and 2 drug and alcohol treatment centers in the greater Houston, Texas, area; and a hospital-based obstetric/gynecology practice and a community-based primary care center in Richmond, Virginia.

To be eligible to participate in the study, women had to be of childbearing age (18–44), and fertile (no tubal ligation, menopause, or other reason for infertility); must have had sexual intercourse with a man (not surgically sterile) in the past 6 months, using ineffective or no contraception; and must not have been pregnant or planning to become pregnant. In addition, a woman must have reported drinking >7 standard drinks per week on average or having ≥1 binge drinking episode (≥5 standard drinks in a single day) during the past 3 months, stated that she would remain available for the 6-month follow-up period, and spoken English. Women were paid between $20 and $35 per session, depending on local research compensation norms. Each participant provided written informed consent on forms approved by site-specific Institutional Review Boards and the Centers for Disease Control and Prevention's Institutional Review Board.

### Intervention

The intervention consisted of 4 MI sessions and 1 contraceptive counseling session. The goal of MI is to provide personalized feedback of risk, motivate the woman to change 1 or both of the target behaviors (reduction of alcohol use and improved contraception), decrease her temptation to engage in risk behavior and increase her confidence to avoid it, facilitate goal setting, develop change plans, and encourage her to attend the contraceptive counseling visit (Table 1). Discussions in each session were tailored to each participant's self-rated readiness to change and interest in discussing alcohol use or contraception. This tailoring is consistent with the MI approach.

The contraceptive counseling visit included taking a medical history, discussion of the woman's options for contraception and concerns about particular methods, a physical examination and pregnancy test if requested, and provision of contraceptive prescription or contraceptives if requested. Women were also provided with brochures detailing information on alcohol and health, available birth control methods, and additional referral resources.

**TABLE 1.** Components of Counseling Sessions

| |
|---|
| Session 1 |
| Rapport building |
| Review of Women and Alcohol Fact Sheet |
| Review of Contraceptive Methods Fact Sheet |
| Advice to schedule contraceptive counseling visit |
| Daily journal for drinking, intercourse, and contraception |
| Decisional Balance for pros and cons of drinking |
| Decisional Balance for pros and cons of contraceptive use |
| Brochures on alcohol, contraceptive methods and community resources |
| Gift pack containing bus tokens, condoms, and maps for follow-up appointments (varied slightly by site) |
| Session 2 |
| Personalized feedback (derived from baseline assessment) |
| Review and discussion of information recorded in the daily journal |
| Arrangement of contraception counseling visit |
| Review of Decisional Balance exercise |
| Completion of Self-Evaluation Rulers addressing readiness to change drinking and contraception |
| Completion of initial Goal Statement and Change Plan |
| Discussion of Temptation and Confidence profiles |
| Session 3 |
| Discussion of contraception counseling appointment |
| Discussion of information recorded in daily journal |
| Review and update of Decisional Balance and Self-Evaluation exercises, Goal Statements and Change Plans |
| Session 4 |
| Review of previous sessions |
| Review of goals and finalization of Change Plans |
| Problem solving, reinforcement of goals, strengthening commitment to change, and discussion of the participant's next steps |
| Contraceptive counseling visit |
| Determine appropriate and suitable contraceptive methods |
| Provide prescriptions or services |
| Provide follow-up clinical care or referral as needed |

### Clinicians and Preintervention Training

A total of 15 counselors conducted the MI sessions; all were masters-level counselors or doctoral-level clinical and counseling psychologists or trainees. Many had participated in previous clinical research, and all counselors received centralized training in the study protocol, local training in MI by experienced MI trainers, and ongoing regular supervision. The 7 health care providers who conducted the contraception counseling sessions included 4 obstetrician-gynecologists and 3 family planning clinical specialists.

### Study Population

A total of 190 women provided informed consent and were enrolled in the study, approximately one third from each pair of sites (31.1% in Virginia, 31.1% in Florida, and 37.8% in Texas). The women were mostly white (37.4%) or black (45.3%) non-Hispanic with a mean age of 30.9. More than three fourths (77.4%) of the women reported having at least a high school education, and 64% reported incomes of <$20 000. Table 2 provides additional demographic information. Recruitment ranged from 11 women in a primary care setting to 54 women in a large urban jail. All of the women attended at least the first therapy session, 92.1% of the women attended session 2, 67.4% attended session 3, and 59.5% attended session 4. The contraceptive counseling visit was attended by 62.1% of the women. Follow-up rates were favorable with 73.2% of the women responding to the 3-month assessment (telephone call) and 75.3% responding to the 6-month assessment (in person).

All of the women in the study were at risk for having an AEP at baseline (drinking at risk levels, sexually active, and not using contraception effectively). Of the 190 women, 189 (99.5%) reported 1 or more binges in the past 6 months and 122 (64.6%) women reported frequent drinking (>7 drinks per week) in the previous 3 months. Sixty-seven (35.4%) of the women had binged only and were not frequent drinkers, and 122 women (64.2%) reported both of the drinking behaviors. A total of 128 women (67.4%) reported using some (although not consistent) contraception, most fre-

**TABLE 2.** Baseline Demographics ($N = 190$)

| Baseline Variable | Mean (Range) | SD |
|---|---|---|
| Age | 30.87 (18–44) | 7.34 |
| Education | 12.65 (6–17) | 2.21 |
| | *N* | % |
| Race/ethnicity | | |
| White (non-Hispanic) | 71 | 37% |
| Black (non-Hispanic) | 86 | 45% |
| Hispanic | 17 | 9% |
| American Indian | 7 | 4% |
| Other | 9 | 5% |
| Marital status | | |
| Single | 98 | 52% |
| Married | 21 | 11% |
| Separated | 27 | 14% |
| Divorced | 18 | 9% |
| Widowed | 5 | 3% |
| Living together not married | 21 | 11% |
| <$20 000* | 121 | 64% |

SD indicates standard deviation.
* $N = 189$.

quently condoms ($n = 101$; 53.2%) and birth control pills ($n = 33$; 17.4%).

### Analysis

The analytic approach taken was in keeping with the purpose of the study, to estimate the feasibility and potential of MI in reducing drinking and increasing contraception in women who were at risk of having an AEP. Without a randomized control group, special consideration was given to examining potential differences that might exist between women who completed the 6-month assessment and those who did not. A series of $\chi^2$ (dichotomous variables) and *t* tests (continuous variables) were run to determine whether there were differences between these groups.

Next, in a set of bivariate logistic regressions, several baseline variables were examined as potential predictors of outcome. Variables were selected on the basis of predictors of "at risk" women found in a previously conducted epidemiologic survey by this research group in the same settings[17] and variables hypothesized to be related to the primary outcomes. These include previous alcohol treatment, previous mental health treatment, number of sexual partners in the past 30 days, current smoking, current drug use, confidence to abstain from alcohol, temptation to drink, and the AUDIT score. In addition, the number of counseling sessions completed and whether a woman attended her contraceptive counseling visit were examined as possible predictors of outcome (Table 3).

Because of the exploratory nature of the analyses, multivariate models of hypothesized relations were not conducted. Hypothesizing and examining such models are more appropriate to a subsequent clinical trial.

## RESULTS

A woman was considered not to be at risk for having an AEP at the 6-month follow-up contact if she was not at risk for pregnancy (reported abstaining from sexual intercourse or consistent use of effective contraception during the 6 months since the last MI counseling session) or if she reported drinking below risk levels (≤7 drinks per week in the past 3 months and no more than 4 drinks on any day in the past 6 months), or both. Of the 143 women who completed the 6-month assessment, 98 (68.5%) satisfied at least 1 of the criteria for successful change, 18 (12.6%) through reduced drinking only, 33 (23.1%) through minimized risk of pregnancy only, and 47 (32.9%) through both reduced drinking and minimized risk of pregnancy. Only 45 (31.5%) remained at risk for having an AEP. Results were consistent across settings. If we were to assume that all 47 women who did not complete a 6-month assessment were nonchangers, then 51.6% of the women successfully changed.

Of the 78 (54.5%) women who reported risk-level drinking at the 6-month follow-up, 75 (96.2%) reported 1 or more binges in the past 6 months, and 26 (33.3%) reported frequent drinking in the previous 3 months. Of the 80 (55.9%) women who had minimized risk of pregnancy at the 6-month follow-up, 12 (15.0%) abstained from sexual intercourse and 68 (85.0%) used consistent effective contraception, primarily condoms and birth control pills.

Analysis to examine potential baseline differences between women who completed the 6-month follow-up assessment and those who did not found no significant differences between these groups by recruitment site ($P = .300$) or on the demographic characteristics age ($P = .108$), race ($P = .671$), marital status ($P = .312$), employment ($P = .938$), or income (<20 000; $P = .702$). There were also no differences found between groups on the baseline descriptors previous alcohol treatment ($P = .138$), lifetime drug use ($P = .816$), being a current smoker ($P = .904$), or total AUDIT score ($P = .956$).

At the 6-month evaluation, low baseline values of both the AUDIT and BSCQ-T tests were significantly associated with successful change (Table 3). AUDIT

**TABLE 3.** Predictors of "At Risk for an AEP"

| | OR or Regression Coefficient | SE | WALD | *P* | 95% CI | |
|---|---|---|---|---|---|---|
| Baseline predictor variables, dichotomous | | | | | | |
| Previous alcohol or drug treatment | 1.724 | .364 | 2.239 | >.135 | 0.845 | 3.516 |
| Previous mental health treatment | 0.780 | .426 | .340 | >.560 | 0.339 | 1.797 |
| Current smoker | 1.308 | .391 | .470 | >.493 | 0.607 | 2.816 |
| Drug use in past 6 mo | 1.717 | .406 | 1.774 | >.183 | 0.775 | 3.805 |
| Baseline predictor variables, continuous | | | | | | |
| Number of sexual partners in past 30 d | 0.019 | .016 | 1.320 | >.251 | 0.987 | 1.052 |
| Audit Score* | 0.046 | .018 | 6.482 | >.011 | 1.011 | 1.084 |
| BSCQ | −0.164 | .194 | .721 | >.396 | 0.581 | 1.240 |
| BSCQ-T* | 0.528 | .220 | 5.762 | >.016 | 1.102 | 2.609 |
| Intervention participation predictor variables, dichotomous | | | | | | |
| Attended at least 3 MI counseling sessions | 0.445 | .432 | 3.511 | >.061 | 0.191 | 1.038 |
| Attended 4 MI counseling sessions | 0.534 | .387 | 2.626 | >.105 | 0.250 | 1.140 |
| Attended contraceptive counseling visit | 0.494 | .397 | 3.150 | >.076 | 0.227 | 1.076 |

Bivariate logistic regression (dependent variable: 0 = not at risk; 1 = at risk).
* Significant predictor.

questions measuring dependence and consequences of drinking were highly predictive. Thus, women who felt least able to control their drinking behavior and experienced more temptation to drink were least successful at changing their risky behavior. Previous alcohol treatment, number of partners in the past 30 days, current smoking, current drug use, number of sessions completed, and baseline BSCQ scores were not statistically significantly associated with successful change at the $P = .05$ level.

## DISCUSSION

The motivational intervention seems feasible and effective in reducing risky drinking and facilitating effective contraception. The 6-month follow-up was completed by 75.3% of the women, 68.5% of whom were no longer at risk for having an AEP. Even if we take the most conservative view that women who did not complete the 6-month follow-up were still at risk for having an AEP, 51.6% of the women were no longer at risk at 6 months.

Incorporating a dual focus of alcohol reduction and contraception in the intervention was an important component of this project. As the results show, some women chose to change only their drinking, others changed only their contraceptive practices, and still others changed both. Offering choice can be an important part of a preventive intervention because people tend to be more committed to goals that they establish for themselves.[18]

Examining whether women would complete the sessions was an important part of the feasibility study because of its preventive nature. Whereas women who self-identify problems and seek out treatment would be expected to have a higher rate of compliance with session attendance, the women in this study did not necessarily see themselves as having a problem. It is possible that tailoring the intervention to the participant's choice played a role in nearly two thirds of them completing all 4 MI counseling sessions.

The success of this intervention did not seem to be dependent on clients' attending all 4 sessions. The data on the relationship between attending 3 of the sessions and successful outcomes, however, was less clear. Although the findings indicated that risk status at 6 months was not significantly related to attendance at session 3, given the relatively low $P$ value, the issue of number of sessions required for successful outcomes warrants additional study.

A surprising finding was that there were few predictors of success. Women who had lower AUDIT scores were less likely to be at risk during the follow-up interval, especially those with lower scores on items that measure dependence symptoms and consequences of drinking. Similarly, women who felt more tempted to drink were less likely to succeed. Taken together, these findings suggest that a woman's beliefs about her ability to deal with temptation may mediate outcomes.

A limitation of the study is that all data are self-reported. Thus, it is possible that some participants' reports of change were attributable to social desirability or wanting to please the study personnel. However, there is evidence that the accuracy of self-reports in alcohol treatment studies is comparable to that of biochemical validation or collateral reports.[19] In addition, in this study, women were financially compensated for time and travel expenses. Although payment was not contingent on success, the financial compensation might have influenced some women's self-reports. An additional limitation is that women were followed only for 6 months. Thus, it is impossible to know whether the intervention would have a long-term impact.

## CONCLUSIONS

Development of brief motivational interventions that could be integrated into primary care settings could enhance early intervention and treatment options for childbearing-age women. Future studies will help to determine whether this approach is significantly better than a standard educational approach currently in practice. A stage II clinical trial is now under way to test the efficacy of this intervention using a randomized controlled design. In the meantime, the findings of this study reinforce earlier reports of the value of MI in reducing high-risk drinking behaviors among female clients while providing encouraging evidence of its value in promoting effective contraception.


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