THE INFLUENCE OF AN ALCOHOL INTERVENTION ON THE USE OF
CONTRACEPTION AMONG LOW-INCOME WOMEN

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Past research has shown a correlation between “risky” behaviors such as excessive alcohol use, and unprotected sexual intercourse. This study investigates the effects of an alcohol intervention on contraception usage among low-income women in the San Diego area. One hundred and fifty low-income women were randomly assigned to either a treatment group (receiving an alcohol intervention with personalized feedback) or to a control group where they received standard information about reducing alcohol consumption with no personalized feedback. Amount of alcohol consumption in the 30 days prior to assessment was recorded, as well as contraceptive habits. Follow-up phone calls were conducted one month after baseline. Rates of contraception usage at follow-up among women in the control group versus treatment group were not significantly different ($p = .193$) after controlling for baseline contraception use, type of contraception used, ethnicity, and marital status. The results suggest the need for a multi-pronged approach when trying to change contraceptive behaviors among low-income women.
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CHAPTER 1

INTRODUCTION

Prenatal alcohol exposure is one of the most preventable causes of birth defects today (Fabbri, Farrell, Penberthy, Ceperich, & Ingersoll, 2009; Project CHOICES Research Group, 2002). No level of alcohol is considered safe to drink during pregnancy. An alcohol-exposed pregnancy (AEP) is defined as a pregnancy during which the mother has consumed any amount of alcohol, thereby putting the fetus at risk for a range of developmental disorders (Centers for Disease Control [CDC], 2010). As such, one of the objectives of Healthy People 2020 is to eliminate alcohol consumption in 98.3% of pregnant women, and binge drinking in 100% of pregnant women (U. S. Department of Health and Human Services, 2010). Women considered “at-risk” for an AEP are defined as able to become pregnant, sexually active, not using contraception effectively, and drinking alcohol above recommended levels (more than 7 drinks per week or 5 drinks in a single day) (Dum et al., 2009; Project CHOICES Research Group, 2002).

THE PROBLEM OF ALCOHOL EXPOSED PREGNANCY

AEPs can lead to negative fetal outcomes, known as Fetal Alcohol Spectrum Disorder (FASD), which range from mild to fatal. The most disabling of these birth defects are grouped as Fetal Alcohol Syndrome (FAS) (Dum et al., 2009). The most common characteristics of children with FASD include: learning disabilities, poor coordination, growth deficiencies, social/interpersonal skill deficits, brain damage, school difficulties, attention deficit hyperactivity disorder, organ defects, poor memory, and significant facial
abnormalities (CDC, 2010; Fabbri et al., 2009; Nolen-Hoeksema, 2004; Project CHOICES Research Group, 2002; Tzilos, 2010). Reports from the Centers for Disease Control and Prevention (CDC) and the National Organization on Fetal Alcohol Syndrome estimate that up to 6,000 children are born with FAS each year, and over 30,000 more have some form of alcohol-exposure damage (Tzilos, 2010). FAS is considered the most preventable cause of mental retardation in children. The average IQ for children diagnosed with FAS is in the low 70s (Mattson & Riley, 1998).

There is a relationship between types and severity of FAS disorders and the stage of pregnancy during which alcohol was consumed (Guerri, Bazinet, & Riley, 2009). High levels of alcohol consumption in the earliest stages of pregnancy (when many women are unaware of their pregnancy) are associated with increased facial abnormalities and neuropsychological disorders among offspring (Ernhart et al., 1987). Alcohol consumption during weeks 7 through 20 has been found to have a negative impact on development of the cerebral cortex and nervous system (Rubert, Minana, Pascual, & Guerri, 2006). However, a study of Finnish and Danish women found that after adjusting for maternal smoking and social adversity, low levels of alcohol consumption (less than 4 drinks per week) across all weeks of pregnancy were not correlated with parent and teacher reports of child hyperactivity symptoms (Rodriguez et al., 2009). Thus, alcohol consumption during pregnancy may be related to timing and other variables, including health behaviors and socioeconomic status.

The disabilities experienced by those with FASD come at a cost to both the individual and the government providing public health funding for FASD care. According to the most recent data from the United States (U.S.) Department of Health and Human Services, FASD cost the U.S. over $5 billion in 2003. Of the total cost, $3.9 billion came from direct costs
which include expenses from the actual use of goods and services such as medical
treatment), and $1.5 billion came from indirect costs (which include expenses due to the loss
of potential productivity of both caregivers and those diagnosed) (Harwood, 2003). As a
result, reducing in utero exposure to alcohol has become a priority in public health research
(Project CHOICES Research Group, 2002).

ALCOHOL CONSUMPTION
Reducing AEPs involves reducing maternal alcohol consumption and promoting safe
sexual practices, to decrease the chance of drinking during an unintended pregnancy. This
section begins with a brief examination of general alcohol use among women in the U.S.,
followed by information about the drinking habits of pregnant women in general and of
pregnant low-income minority women in particular.

Alcohol Consumption among Women of
Childbearing Age
U.S. women of childbearing age report drinking approximately as much and as often
as the national average for all citizens (Floyd & Sidhu, 2004; CDC, 2004). For example, in a
2004 CDC national study of women between 18 and 44 years of age, 52.6% reported
drinking alcohol. Of the sample women who reported not using contraception, over 50%
drank alcohol, and over 12% reported binge drinking (CDC, 2004). Prevalence of binge
drinking was higher among women who were current smokers, unmarried, white, and
between 18 and 24 years of age (CDC, 2004). Similar findings have been reported in other
studies. Among women of childbearing age, over 50% report having drank alcohol in the past
month, with approximately 14% binge drinking (Fabbri et al., 2009; Project CHOICES
Research Group, 2002). Finally, information collected in 2007 by the National Survey on
Drug Use and Health reports that 64% of non-pregnant women of childbearing age drink alcohol, with 24% reporting binge drinking (Tzilos, 2010).

**Alcohol Consumption during Pregnancy**

Non-pregnant women of childbearing age who consume alcohol are potentially at risk for an AEP. It is estimated that 15-50% of babies are exposed to alcohol prenatally (Fabbri et al., 2009), with 19% of women drinking during their first trimester (Tzilos, 2010). A CDC study that looked at a national sample of pregnant women aged 18-44 reported that 10% of women reported alcohol use and 2% reported binge drinking at some point during their pregnancy (CDC, 2004). A study looking at alcohol use during and before pregnancy among residents of the state of Washington showed a significant decrease in reported alcohol use from 1989 (30%) to 2004 (12%) (Grant et al., 2009). However, reports of binge drinking in the month before conception rose dramatically from 1989 (9%) to 2004 (14%) (Grant et al., 2009). It is possible that women who binge drink prior to conception also continue the behavior after conception and before pregnancy recognition, which greatly increases their risk of having an AEP (Grant et al., 2009).

**Alcohol Use among Low-Income Women**

In a 2003 study of low-income women at San Diego Women, Infants, and Children (WIC) clinics, O’Connor and Whaley found that 24% of women sampled drank alcohol during pregnancy; with two-thirds drinking before pregnancy was recognized and a one-third drinking after recognition of pregnancy (O’Connor & Whaley, 2003). It was also found that preconception alcohol consumption was the best predictor of alcohol consumption during pregnancy for low-income minority women at San Diego WIC clinics (O’Connor & Whaley, 2003). English-speaking non-Hispanic women and English-speaking Hispanic
women reported drinking during pregnancy more often than Spanish-speaking Hispanic women (approximately 30% versus 15.8% respectively). Another study found that 13% of low-income Hispanic women in San Diego WIC clinics reported drinking during pregnancy (both before and after recognition) (Chambers et al., 2005).

It is important to remember that almost all data on AEP is based on self-report. In today’s society, alcohol use during pregnancy is recognized as a negative behavior and is generally considered undesirable. Due to the sensitive nature of the topic it is possible that women intentionally underreport their alcohol use (Tourangeau & Yan, 2007). Similarly, accurate information about daily consumption may be difficult to recall, especially over a long period of time. For example, among a convenience sample of Norwegian women seeking pre- and ante-natal care at a major hospital found that alcohol consumption during pregnancy was generally underreported. Women were asked about alcohol consumption at 17 weeks, 30 weeks, and 6 months after delivery. Reports of alcohol consumption prior to pregnancy recognition and at 13 weeks increased over the 3 report periods, suggesting that concurrent reports of consumption may underestimate actual fetal alcohol exposure (Alvik, Haldorsen, Groholt, & Lindemann, 2006). Preventing FASD requires not only reducing alcohol consumption in pregnant women, but in those at risk of becoming pregnant. This is necessary in order to protect against unintentional drinking in the first trimester.

**CONTRACEPTION USE AND UNINTENDED PREGNANCY**

Preventing AEPs also entails increasing the use of contraception among women at risk of becoming pregnant. A woman is considered at-risk for an unintended pregnancy if she is fertile, “sexually active, and not currently pregnant, postpartum, or trying to get pregnant” (Frost, Singh, & Finer, 2007, p. 1). Approximately one-half of all U.S. pregnancies are
unintended (Drescher-Burke, 2008). That, combined with the high prevalence rates of drinking among women of childbearing age, suggests an increased likelihood of drinking early in the pregnancy. Increasing effective contraception use among at-risk women will help prevent unintended pregnancy and potentially FASD. One objective of the CDC’s Healthy People 2020 is to increase the number of intended pregnancies from 51% to 56% (U. S. Department of Health and Human Services, 2010). Combined with efforts to reduce alcohol consumption, this should be an effective strategy for reducing the prevalence of AEP.

**General Contraception Use in the U.S.**

It has been reported that 62% of American women in the general population use some form of contraception (Drescher-Burke, 2008). However, many women who are using contraception are not using it regularly or correctly, which may account for the large number of unplanned pregnancies in the U.S. (Drescher-Burke, 2008). One important aspect of contraception use is awareness and accessibility of Emergency Contraception (EC). The California Health Interview Survey (CHIS), which is a biannual random-digit-dial survey of the entire state conducted by the UCLA Center for Health Policy Research, the Public Health Institute, and the California Department of Health Services, found that 76% of surveyed women ages 15-44 were aware of EC in 2003 (Baldwin et al., 2008). This data does not account for actual, correct, or effective use of EC, however. In a 2004 nationally representative sample of 18-44 year old women considered at-risk for unintended pregnancy (of childbearing age and not consistently using contraception), 8% did not use contraception at any point during the previous 12 months, 30% reported gaps in usage, 24% reported having switched methods at least once in that time period, and 38% reported using the same method consistently during the year (Frost et al., 2007). Women who reported gaps in usage
were either pregnant, not sexually active at the time, having problems with access or use, financially constrained, experiencing negative side effects, or uninterested in available methods. Approximately 20% of women who reported no use of contraceptives cited ambivalence towards becoming pregnant. Six percent of non-users believed that they were unable to get pregnant. These data suggest that there is room for improvement regarding perceived severity of unintended pregnancy, especially concerning women at-risk for an AEP.

**Contraception Use among Low-Income Women**

There are important socioeconomic and income-level disparities to consider regarding contraception use and unintended pregnancies in the U.S. Pregnancy data collected from New York City health departments between 1998 and 2001 examined pregnancy rates by age, race, marital status, contraception use, alcohol use, and smoking (Besculides & Laraque, 2004). Results showed that unmarried women were 2.5 times as likely to have an unintended pregnancy compared with married women. Eighty-two percent of all pregnancies were unintended for unmarried women, which is much higher than the national average (Drescher-Burke, 2008). Women with the greatest risk of unintended pregnancy were those who drank alcohol, were young, and unmarried. This data suggests that interventions for unintended pregnancies may need to focus on low-income urban populations of unmarried women, where prevalence seems to be much higher than the national average (Besculides & Laraque, 2004).

The socioeconomic disparities found with unintended pregnancies may be a direct result of differences in contraception use among various groups of women. For instance, Drescher-Burke (2008) found that educated women are more likely to use contraception than
those with a high school diploma or less. Additionally, women below the poverty line are less likely to use contraception than women with higher incomes (Drescher-Burke, 2008), and women with low educational attainment have three times as many unplanned pregnancies as do women with college degrees (Drescher-Burke, 2008). A cross-sectional survey of a convenience sample of Tennessee women seeking federal assistance found that contraception use was significantly lower among Hispanic women than non-Hispanic women (Garces-Palacio, Altarac, & Scarinci, 2008). A study using a convenience sample of low-income Hispanic women in the San Francisco area who were seeking care at a public hospital found that 45% were having unprotected sex all or most of the time (while not wishing to conceive) (Jackson, Schwarz, Freedman, & Darney, 2000). Of these women, 38% had already had an unplanned pregnancy, 17% had had abortions in the past, and 63% were unintentionally pregnant at the time of interview (Jackson et al., 2000). Only 36% of these were aware of EC, only 19% could describe EC pills, and 7% knew the correct procedure for using EC (Jackson et al., 2000). Of women in the 2003 CHIS, awareness of EC was lower among women who were low-income, non-white, teenaged, immigrant, and rural (Baldwin et al., 2008). Consequently, it appears that lack of education or income could place women at a much higher risk for both unplanned pregnancy and thus prenatal alcohol-exposure.

**Barriers to Contraceptive Use**

There are many potential barriers to effective contraception use. Among low-income Latinas, commonly reported barriers are negative attitudes regarding side effects of hormonal contraception and incorrect knowledge about contraception (with preference given to anecdotal information over that from professionals) (Gilliam, Warden, Goldstein, & Tapia, 2004). A study of racially, ethnically, and socio-economically diverse women in the Rhode
Island area also identified self-efficacy for condom use as a frequent barrier to proper contraceptive use. Women who were under 20 years of age and scored low on measures of condom self-efficacy were at much higher risk for unprotected sexual intercourse compared with women who were older and reported higher condom self-efficacy (Peipert et al., 2007). Non-U.S. born Hispanics reported the highest number of barriers to effective contraception use, when compared with U.S. born Hispanics or non-Hispanic whites in a survey of sexually active, low-income women at two Texas clinics (Sangi-Haghpeykar, Ali, Posner, & Poindexter, 2006). The barriers listed include low levels of social support, low self-efficacy for condom use, desire for large families, religion, and the role of women as providers of contraception (Sangi-Haghpeykar et al., 2006).

**Correlations Between Alcohol Use and Contraception Use**

When examining the causes of alcohol-related birth defects, researchers have considered the relationship between alcohol and contraception. Past research has shown that alcohol use lowers inhibitions and can thus lead to poor judgment regarding safe sex practices (Drescher-Burke, 2008). In a 2009 randomized control trial aimed at reducing AEPs among at-risk women, 25.8% of non-pregnant, sexually active women who reported engaging in risky drinking and ineffective contraception use reported alcohol influence as a reason for episode-specific unprotected sex (Fabbri et al., 2009). Studies of youth have found similar results (Nolen-Hoeksema, 2004). In a 2009 study of both male and female college students in the U.S. and Canada, researchers found that participants with multiple sexual partners reported less frequent condom use while or immediately after drinking (Certain, Harahan, Saewyc, & Fleming, 2009).
The influence of alcohol on sexual behaviors is not always episode-specific, however; an individual does not necessarily have to be drinking immediately prior to intercourse in order to fail to use contraception. A habitually heavy drinker may be less likely to use condoms at all (Drescher-Burke, 2008). In the aforementioned 2009 college study, males who drank heavily were significantly less likely to use condoms in general than those students who drank lightly or moderately (Certain et al., 2009). Similarly, a convenience sample of African-American women in Alabama neighborhoods with a high prevalence of sexually transmitted infections found that participants were significantly less likely to use contraception if they also drank any amount of alcohol during at least twenty days of each month (Wingood & DiClemente, 1998). Finally, surveys of the U.S. population in general during the 1990s report that alcohol-consuming adults are also more likely to have liberal sexual attitudes, meaning that they are more sexually assertive, less selective regarding partners, and participate in risky sexual behaviors such as multiple partners and unprotected sex (Nolen-Hoeksema, 2004).

In contrast, other studies have reported no significant effect of alcohol on condom use. Research by Leigh et al. (2008) using a daily diary method of information collection, found condom use among college students to be unrelated to alcohol consumption prior to the sexual encounter. However, the Leigh et al. study did not appear to account for the amount of drinking that occurred prior to each sexual encounter. It is possible that the students in that sample were drinking lightly before intercourse, which may not have influenced their risk-taking behavior. Similarly, a 2007 survey of U.S. college students found that the impact of alcohol consumption on unprotected sex was modified by partner status, such that unprotected intercourse was associated with alcohol use only when the encounter
was with a non-steady partner; contraception during intercourse with a steady partner was not related to alcohol consumption (Brown & Vanable, 2007)

The relationship between alcohol use and contraception use remains unclear in current research. In Fabbri et al.’s 2009 survey of women at risk for an AEP, women with the least effective contraception use were also the women with the lowest contraceptive self-efficacy and motivation. This finding supports previous research showing confidence and self-efficacy to be serious barriers to effective contraception use among at-risk women (Peipert et al., 2007; Sangi-Haghpeykar et al., 2006). In the same study, women with the highest levels of problem drinking were also those with the highest motivation to change (Fabbri et al., 2009). Both behaviors are heavily influenced by context, demographics, personality, and self-efficacy. Individuals who typically drink low levels of alcohol and practice safe sex while in a relationship may find themselves making different choices after a breakup or while using other illicit substances. Similarly, women who report using contraception may in fact be unconcerned with using it consistently or correctly. The dissonance among current research suggests that reducing AEPs is a complicated behavior that should most likely be approached from a multi-pronged intervention.

**PAST INTERVENTIONS TO PREVENT ALCOHOL-EXPOSED PREGNANCIES**

The vast majority of AEP interventions are focused on alcohol consumption alone. Most of these studies have shown significant benefits to alcohol-only interventions in reducing the amount of alcohol consumed before or during pregnancy (Armstrong et al., 2009; Chang et al., 2005; Manwell, Fleming, Mundt, Stauggacher, & Barry, 2000; O’Connor & Whaley, 2007). These results support the belief that reduction of AEP risk involves a reduction in alcohol consumption, and that such changes can be made through simple
motivational or interactive counseling. Kinzie, Schorling, and Siegel (1993) found additionally that reducing prenatal alcohol consumption may be possible through the use of a computerized intervention. Researchers designed a computerized intervention program that utilized participants' knowledge, beliefs, and attitudes about alcohol use. Researchers found that the program was well-received and successful at providing new, novel information to participants. They suggest that a computerized approach may be useful in low-income settings where an increase in staff for intervention purposes would be unfeasible. However, research utilizing technological approaches remains limited.

Despite the success of past interventions at reducing alcohol-intake, prevalence rates for AEP remain high. It is possible that reduction in AEP rates may also require interventions to target contraception use. One of the most commonly cited study regarding the addition of contraception use to AEP interventions is the CDC’s Project Choices (Fabbri et al., 2009). This study implemented a four-session motivational counseling intervention aimed at reducing risk for alcohol-exposed pregnancy. It was a multi-pronged approach focusing on decreasing alcohol consumption among at-risk women and increasing contraception use. Participants attended four motivational counseling sessions and provided information at baseline and six months after completion of the intervention. Researchers found that almost 70% of women reduced their risk for AEP. Women with the lowest reported baseline alcohol consumption had the greatest reduction in AEP risk, compared with women with the highest reported baseline alcohol consumption. Both groups of women reduced their alcohol consumption and increased their contraception use, but women with the lowest baseline alcohol consumption were more successful at increasing contraception use consistently. Women with lower baseline drinking scores were most successful at increasing contraception
use, rather than decreasing alcohol use, likely because they did not view their drinking behavior as problematic (Fabbri et al., 2009). Similarly, women with high baseline drinking scores were more successful at reducing alcohol consumption than they were at improving contraceptive use, likely because they became aware of the dangerous consequences of their drinking (Fabbri et al., 2009). This intervention was limited by its lack of a control group and its reliance on self-reports of alcohol and contraception use. Results from this study highlight the importance of contraception inclusion, as evidenced by the differences in AEP risk reduction success based on baseline alcohol consumption. Women with low levels of baseline alcohol consumption were more responsive to contraception counseling than to alcohol counseling, and may have been unaffected by interventions aimed only at alcohol use.

Taken together, past interventions aimed at reducing AEPs support the need for a multi-pronged approach. Simply assessing a woman’s alcohol consumption may not give a complete picture of her risk for an AEP. It appears beneficial to collect information about contraception use and to attempt to intervene on that behavior in order to create a more comprehensive intervention.

**The Health Belief Model**

The Health Belief Model (HBM) is a widely used theoretical model originally designed to predict behaviors related to disease prevention, screening, or control (Glanz, Rimer, & Viswanath, 2008). Its main constructs include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. The combination of perceived susceptibility and perceived severity is known as perceived threat. Increasing an individual’s perceived threat involves increasing both the extent to which she
feels vulnerable to a certain disease or outcome, as well as the perceived severity of acquiring that disease or outcome. Another goal of the HBM is to increase the perceived benefits construct, by emphasizing the positive aspects of adopting a healthy lifestyle, and to decrease the perceived barriers to healthy behavior. The cues to action construct refer to reminders in a person’s life that may lead him or her to engage in a behavior. This can include advice from doctors, public messages from celebrities, or incentives at work. Finally, the self-efficacy construct deals with how confident a participant is that she can effectively engage in a behavior. Low self-efficacy can often serve as a barrier itself, and improving this construct is an important aspect of utilizing the HBM.

Application of the HBM has been effective in previous intervention research on risky behaviors and can thus be considered an appropriate model for this study (Glanz et al., 2008). However, the HBM is often considered less effective for behaviors that deal with addiction, due to biological influence, which is not addressed by the model (Galvin, 1992). Consequently, women showing signs of alcoholism will be excluded from this study, and thus the predictive power of the HBM should remain strong.

Tailoring this intervention to the HBM involves addressing the following constructs: knowledge, perceived threat, barriers/benefits, cues to action, and self-efficacy. Based on past research, it can be argued that a lack of knowledge is a key issue in the risky sexual behaviors of low-income women, and that increasing their knowledge can have a drastic effect on their behavior. Increasing their knowledge about the dangers of FAS should in turn increase participants’ perceived threat of having a child with FAS, as well as help to provide cues to action (through take-home literature and follow-up calls) that will motivate participants to change their behavior. Benefits of reducing their alcohol consumption will be
addressed by modeling for participants the amount of money and calories they can save by reduction. Barriers to safe behavior (specifically the barrier of misinformation) will be addressed through the provision of take-home literature. While the self-efficacy construct is not specifically measured in the present study, it is possible that by improving knowledge, threat, and benefits, participants will feel more capable of preventing FAS in their lives.

**THE PRESENT STUDY**

The present study will assess if an alcohol-specific intervention, which was aimed at decreasing FAS, also influences contraception use. We hypothesize that the number of women who report using contraception will be significantly higher in the treatment group compared with the control group for one month post baseline measurement. Additionally, we hypothesize that women with a higher drinking level at baseline are less likely to report using contraception at either baseline or one month follow-up, compared with women with moderate drinking level.
CHAPTER 2

METHOD

This chapter begins with an overview of the study design, as well as an account of the pilot study conducted prior to program implementation. It continues with a description of the participants, measures, and methodology used to collect data. It concludes with an outline of the plan for analyzing collected data.

STUDY DESIGN

The current study was conducted using data from a larger study examining the effectiveness of a web-based intervention at reducing alcohol consumption in low-income women (Delrahim-Howlett, 2010). The larger study used a double-blind, two-group randomized control design. After completing initial pre-screening and giving consent to participate, women were randomly assigned to either the control group or treatment group. Participants in each group completed the baseline measures and were asked to complete two follow-up assessments. The first follow-up assessment occurred one month post baseline; the second follow-up assessment occurred two months post baseline. Women in the treatment group were given personalized feedback from the assessment program, while women in the control group were given general information about FAS.

PILOT STUDY

A brief pilot study was conducted prior to implementing the completed design. This program evaluation was done at a WIC clinic not involved in the complete study. Ten women waiting in the lobby were asked to help with a research study by completing a quick
computerized assessment and follow-up survey. The women who agreed to participate completed the assessment followed by a brief survey about their experiences with and feelings toward the program. Each woman was given a $5 Target gift card as compensation for her time. The information provided by the women in the pilot study was used to help modify the program, in order to make it more user-friendly and accessible to the target population.

**PARTICIPANTS**

Researchers approached 1,502 English-speaking women, who were not noticeably pregnant, to be screened for potential participation. Of these 1,502 women, 1,488 were interested in being screened. Once screened, 159 women were deemed eligible to participate in the study, based on the following exclusion criteria:

1. She was not between 18 and 45 years of age.
2. She could not operate a computer.
3. She was not proficient in the English language.
4. She reported NOT consuming three or more drinks on at least one occasion during the previous month.
5. She was illiterate.
6. She was mentally handicap or otherwise unable to provide informed consent.
7. She reported never drinking alcohol.
8. She reported drinking more than twenty drinks during a one-week period at least once in the past month (our threshold for possible alcohol dependency).

Researchers then further informed the women of the particulars of the study, at which time, nine women declined to participate. Thus, a total of 150 women completed the baseline eCheckUp Assessment. Seventy-five of these women were randomly assigned to the treatment group, and seventy-five of these women were randomly assigned to the control
group. Fifteen women (7 Experimental, 8 Control) were lost to follow-up between baselines and one month follow-up.

All participants were women utilizing services provided at WIC clinics in the San Diego area. Women were either clients themselves (had recently given birth or were breastfeeding) or had children who were clients (under 5 years old). Of the 150 participants, 52 were recruited from a clinic located in El Cajon, 44 from a clinic located in Mira Mesa, and 54 from a clinic located in Vista. All women met WIC clinic income requirements and thus had gross incomes at or above 185% of the U.S. Poverty Income Guidelines (U. S. Department of Agriculture, 2009).

**PROCEDURE**

Participants were recruited from one of three SDSU WIC clinics. Upon entering the clinic, women were approached by a researcher and asked if they would be willing to answer a few pre-screening questions. If they agreed to participate, they were given a brief description of the study and screened for eligibility to participate. The screening questions included all criterions for inclusion or exclusion from the study. If a woman was deemed eligible to participate, she was taken to a private area of the clinic where a computer and desk had been set up for research purposes. A researcher explained the study in further detail and asked for informed consent. To begin assessment, each participant was asked to create a unique identification (ID), consisting of the first two letters of her last name, the month of her birth, and the last four digits of her telephone number. This ID allowed the woman to have complete confidentiality. After creating this ID, the computer randomly assigned each woman to the control or treatment group. Analysis confirmed that women in each group were comparable in demographics. A summary of participant demographics for each group can be
found in Table 3. Once a woman had completed the computerized assessment, she received either personalized feedback about her alcohol consumption and general information about FAS (treatment group) or just general information about FAS, with no personalized feedback (control group). She then printed out her results. These results were placed in a folder that contained her compensation and a calendar with the dates of her follow-up calls circled.

At one month postbaseline participants received a follow-up phone call from the researcher. The researcher asked each woman a subset of questions from the original baseline assessment. The information gathered from these baseline calls included current marital status, pregnancy status, current contraceptive use, and alcohol consumption/frequency since the last assessment. Participants were also called at 2 month post baseline, but these data were excluded from analyses in the present study because of non-significant differences in data between the follow-up periods.

Each participant received a $5 Target gift card for completing the baseline measurement, an additional $5 Target gift card (which could be picked-up from their local WIC clinic using their unique study ID number) for completing the 1 month follow-up assessment, and an additional $5 Target gift card for completing the 2 month follow-up assessment. The maximum gift card amount that any woman could receive was $15.

**MEASURES**

The computerized assessment was a modification of the existing and validated e-CHUG (e-Checkup To Go) program, which combines an alcohol assessment with motivational feedback designed for college students (Van Sickle & Sokolow, 2006). The original e-CHUG program has been used in 12 outcome studies, all of which report significant changes in students’ drinking (Van Sickle & Sokolow, 2006). Detailed
descriptions of those studies and the accompanying rationale for the original program can be found on the e-CHUG website (San Diego State University Research Foundation, 2009). Changes were made to the questions in order to make them appropriate for the new population (low-income women of childbearing potential reading at a sixth grade level), and the feedback was altered to include either information about FAS (for the control group), or personalized information about each participant’s health risks, alcohol use, and risks associated with drinking during pregnancy. These changes were made based on differences between our study population, and that of the originally intended audience. A detailed description of how the original e-CHUG program was modified for the purposes of the WIC study can be found in a previous paper (Delrahim-Howlett, 2010). A copy of the modified e-CHUG assessment can be found in Appendix A of this paper.

Women in the treatment group were provided with feedback regarding their alcohol consumption (number of drinks, number of standard drinks, drinking pattern, comparison to peers), associated health risks and cost, general information about alcohol consumption, and a list of resources. A full example of the feedback provided to participants in the treatment group is provided in Appendix B. Women in the control group received general information about alcohol consumption, health risks, and a list of local resources. A full example of the feedback provided to participants in the control group can be found in Appendix C.

Example of treatment group feedback:

On average you reported drinking 12 drinks per week in the last two weeks. This equals an average of 18 standard drinks per week in the last two weeks based on the picture you chose that looks like the typical drink you have. You typically drink 7.5oz of wine in a red wine glass. That is equal to 1.5 standard drinks… You reported that you (or whoever buys alcohol for you) spends $2600.00 on alcohol each year… In the last two weeks you drank about 4025 calories, or the equivalent of 35 ice cream cones.
The measures used for alcohol consumption were based on methods shown to be valid and reliable from previous research (Delrahim-Howlett, 2010). Studies of self-report data specific to the WIC population have shown that participants tend to under-report their alcohol consumption (Chambers et al., 2005; Hughes et al., 2009). However, this effect may be mitigated by maximizing anonymity (Harrison, 1995), possibly through the use of computerized assessment (Waterton & Duffy, 1984). Measurement of alcohol use was guided by the recommendations of the National Institute on Alcohol Abuse and Alcoholism’s (NIAAA) Task Force on Recommended Alcohol Questions (NIAAA, 2003). A modified version of the Timeline Follow-Back (TLFB) procedure was used to assess quantity and frequency of alcohol use, as it has demonstrated validity and reliability in past research (Pearson Correlations ranging from 0.7 to 1.0) (Jacobson, Chiodo, Sokol, & Jacobson, 2002; Sobell, Sobell, Leo, & Cancilla, 1998). The TLFB method specifies a time interval and asks participants to reconstruct their drinking behavior. In this study the time interval was the two-week period prior to measurement. Additionally, standard drink sizes were measured using the guidelines of the NIAAA and graphical representations of these drinks were used in the assessment (NIAAA, 2003).

All participants were asked to provide their age (continuous), race/ethnicity (categories provided by the National Institutes of Health), education level (discrete), marital status (categorical), contraception use (dichotomous), contraception method (categorical), drug use (dichotomous), tobacco use (dichotomous, and continuous number for smokers), drinking category (dichotomous), number of children (discrete), and number of lifetime pregnancies (discrete). Additional variables were measured, such as participants’ knowledge of risks of alcohol consumption, but were considered outside the scope of this study.
The ethnic group variable was re-coded for analysis purposes as White/Caucasian versus Non-White/Caucasian. Relationship status was coded as married versus unmarried. Baseline use of contraception was coded as Yes versus No. Drinking Category is defined as Moderate versus Heavy. Moderate drinking applies to women who reported no more than one drink per day, or seven drinks per week. Heavy drinking applies to women who reported over 7 drinks per week. These categories were identified using the U. S. Department of Agriculture and the U. S. Department of Health and Human Services (USDHHS, 1990). Effectiveness of Contraception Use is defined as Not Effective/Not Using, Somewhat Effective (condoms) Effective (shot, ring, patch, pill), or Very Effective (IUD, implant). These distinctions are aligned with WHO established levels of effectiveness (World Health Organization/Department of Reproductive Health and Research (WHO/RHR) & Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs (CCP), INFO Project, 2007).

**DATA ANALYSIS PLAN**

The primary objective of this study was to compare contraception usage among women who receive personalized feedback (treatment group) and women who receive general FAS information (control group). A secondary objective was to examine the potential association between alcohol consumption (as measured by drinking category) and reported contraception use at both baseline and follow-up.

Analysis: Bivariate analyses (t-tests and chi-squared tests) were run to identify potential relationships between the outcome variable (contraception use at one month post baseline) and variables with which it has been significantly related in past research (i.e., ethnicity and relationship status). A logistic regression test was used to test the hypothesis
that more women in the treatment group would report using contraception at 1 month postbaseline when compared with women in the control group. The dependent variable was the
number of women reporting using contraception (binary), and the independent variable was
group assignment. Additional analyses were run to examine differences in contraception
usage among various subgroups, in an effort to identify possible covariates. To assess the
relationship between drinking category and contraception use at one month follow-up, a chi-
square analysis was run.
CHAPTER 3

RESULTS

This chapter starts with a description of the participants, including a comparison of those in the treatment versus control group. The chapter then describes the process of testing for nested data and randomization. It concludes by discussing the analyses used to test each hypothesis.

PARTICIPANT CHARACTERISTICS

Table 1 shows detailed demographic information of the participants. The mean age for all participants was 26.33 years (SD 5.30). The average years of education was 12.85 years (SD 2.02).

Forty four percent of study participants were Hispanic, 34% were Caucasian, 8% were African American, 8% were Multi-Racial, and 6% were Other. This racial and ethnic breakdown is somewhat representative of all WIC clients in the SDSU WIC program, which is 78% Hispanic, 10% Caucasian, 4% African American, 3% Multi-Racial, and 5% Other. This difference in racial and ethnic demographics may be partially due to the inclusion and exclusion criteria that were necessary for successful implementation of the study. The majority of women self-identified as non-married (72%). Fifty percent of women reported having more than one living child, and 60.7% reported not being current smokers. All of the participants were current drinkers (an inclusion criteria), with the average age of first drink being 16.89 (SD 2.7).
Table 1. Demographic Characteristics for Participants in Treatment and Control Groups, N = 150

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>Treatment</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity: n (%)</td>
<td></td>
<td></td>
<td>0.271</td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>27 (36%)</td>
<td>24 (32%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latina</td>
<td>36 (48%)</td>
<td>30 (40%)</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>3 (4%)</td>
<td>9 (12%)</td>
<td></td>
</tr>
<tr>
<td>Multi-Racial</td>
<td>4 (5%)</td>
<td>8 (11%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5 (7%)</td>
<td>4 (5%)</td>
<td></td>
</tr>
<tr>
<td>Age in Years: Mean (SD)</td>
<td>25.75 (5.228)</td>
<td>26.91 (5.335)</td>
<td>0.181</td>
</tr>
<tr>
<td>Education Category: n (%)</td>
<td></td>
<td></td>
<td>1.000</td>
</tr>
<tr>
<td>&lt; High School</td>
<td>13 (17%)</td>
<td>13 (17%)</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>26 (35%)</td>
<td>26 (35%)</td>
<td></td>
</tr>
<tr>
<td>Above High School</td>
<td>36 (48%)</td>
<td>36 (48%)</td>
<td></td>
</tr>
<tr>
<td>Marital Status: n (%)</td>
<td></td>
<td></td>
<td>0.259</td>
</tr>
<tr>
<td>Single/Not Cohabitating</td>
<td>27 (36%)</td>
<td>16 (21%)</td>
<td></td>
</tr>
<tr>
<td>In a Relationship/Not Cohabitating</td>
<td>9 (12%)</td>
<td>9 (12%)</td>
<td></td>
</tr>
<tr>
<td>Single or Relationship/Cohabitating</td>
<td>18 (24%)</td>
<td>18 (24%)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>16 (21%)</td>
<td>26 (35%)</td>
<td></td>
</tr>
<tr>
<td>Divorced or Separated</td>
<td>5 (7%)</td>
<td>6 (8%)</td>
<td></td>
</tr>
<tr>
<td>Number of Living Children: n (%)</td>
<td></td>
<td></td>
<td>0.690</td>
</tr>
<tr>
<td>0</td>
<td>7 (9%)</td>
<td>7 (9%)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>33 (44%)</td>
<td>28 (37%)</td>
<td></td>
</tr>
<tr>
<td>&gt;1</td>
<td>35 (47%)</td>
<td>40 (53%)</td>
<td></td>
</tr>
<tr>
<td>Current Use of Contraception: n (%)</td>
<td></td>
<td></td>
<td>0.862</td>
</tr>
<tr>
<td>Yes</td>
<td>50 (67%)</td>
<td>51 (68%)</td>
<td></td>
</tr>
<tr>
<td>Level of Contraception Effectiveness: n (%)</td>
<td></td>
<td></td>
<td>0.141</td>
</tr>
<tr>
<td>Not Effective (not using)</td>
<td>15 (20%)</td>
<td>14 (19%)</td>
<td></td>
</tr>
<tr>
<td>Somewhat Effective (condoms)</td>
<td>19 (25%)</td>
<td>17 (23%)</td>
<td></td>
</tr>
<tr>
<td>Effective (shot, pill, ring, patch)</td>
<td>32 (43%)</td>
<td>24 (32%)</td>
<td></td>
</tr>
<tr>
<td>Very Effective (IUD, implant)</td>
<td>9 (12%)</td>
<td>20 (27%)</td>
<td></td>
</tr>
<tr>
<td>Tobacco Use [Yes]: n (%)</td>
<td>30 (40%)</td>
<td>29 (39%)</td>
<td>0.867</td>
</tr>
<tr>
<td>Age of First Drink: Mean (SD)</td>
<td>16.81 (2.71)</td>
<td>16.97 (2.70)</td>
<td>0.718</td>
</tr>
</tbody>
</table>

*Note.* p-values ≤ .05 are considered significant.
TESTING FOR NESTED AND RANDOMIZED DATA

To ensure that data was properly randomized and not nested within clinic sites, multiple analyses were run. To test for the independence of data collected from each of the three sites, a Chi-Square test of independence was run for clinic site on follow-up contraception usage. This analysis confirmed an independence among clinic sites ($\chi^2 = 0.93$, $DF = 2$, $p = 0.63$). These results can be found in Table 2, and suggest that there was no nesting among clinic sites and thus no need to conduct additional analyses beyond those planned.

Table 2. Crosstabulation of Clinic Site and One Month Follow-up Use of Contraception

<table>
<thead>
<tr>
<th>Clinic Site</th>
<th>Follow-up Use of Contraception</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>El Cajon</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>Mira Mesa</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Vista</td>
<td>28</td>
<td>19</td>
</tr>
</tbody>
</table>

Note. a = $p > 0.05$

Multiple chi-square comparisons of the treatment and control groups were conducted to assess the effectiveness of baseline randomization. All analyses confirmed non-significant differences on a variety of variables ($p > 0.05$). Results are shown further in Table 3.

BIVARIATE ANALYSIS FINDINGS

To assess the relationship between different participant characteristics and the outcome measure of contraception use at one month follow-up, chi square analyses and independent samples t-tests were conducted. The results of these tests were used to determine which variables might influence the potential impact of treatment group on contraception use at one month follow-up.
Table 3. Comparison of Treatment and Control Group on Demographic Variables and Contraception Behaviors

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnic Group</td>
<td>.267</td>
<td>1</td>
<td>.605</td>
</tr>
<tr>
<td>Age Category</td>
<td>2.219</td>
<td>2</td>
<td>.330</td>
</tr>
<tr>
<td>Education Level</td>
<td>.000</td>
<td>2</td>
<td>1.000</td>
</tr>
<tr>
<td>Drinking Category</td>
<td>.062</td>
<td>1</td>
<td>.803</td>
</tr>
<tr>
<td>Contraception Use</td>
<td>.030</td>
<td>1</td>
<td>.862</td>
</tr>
<tr>
<td>Effectiveness of Contraception</td>
<td>.043</td>
<td>1</td>
<td>.836</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>5.286</td>
<td>4</td>
<td>.259</td>
</tr>
<tr>
<td>Clinic Site</td>
<td>1.080</td>
<td>2</td>
<td>.583</td>
</tr>
</tbody>
</table>

Note. $p$-values $\leq .05$ are considered significant.

As seen in Table 4, the relationship between baseline contraception use and one month follow-up contraception use is significant ($\chi^2 = 28.21, DF = 1, p = .000$). Participants who used contraception at baseline were likely to use contraception at one month follow-up; participants who did not use contraception at baseline were not likely to use it at one month follow-up.

Table 4. Crosstabulation of Baseline Use of Contraception and One Month Follow-up Use of Contraception for Women in Treatment and Control Groups

<table>
<thead>
<tr>
<th>Baseline Use of Contraception</th>
<th>Follow-up Use of Contraception</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>33</td>
</tr>
<tr>
<td>Yes</td>
<td>67</td>
<td>23</td>
</tr>
</tbody>
</table>

Note. *** = $p < .001$

The relationship between ethnic group and follow-up contraception use was not significant ($\chi^2 = 2.263, DF = 1, p = .133$). However, women who identified as non-white were more likely to report not using contraception at follow-up compared with women who
identified as white, as shown in Table 5. Non-white women include women of African, Hispanic, or Multiracial descent.

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Follow-up Use of Contraception</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian/White</td>
<td>Yes: 31</td>
<td>No: 15</td>
</tr>
<tr>
<td>Other/Non-White</td>
<td>Yes: 48</td>
<td>No: 41</td>
</tr>
</tbody>
</table>

*Note. *= \( p \leq .20 \)

Table 6 displays the results of a chi-square analysis of relationship status (coded as single, married, and other) and one month follow-up use of contraceptives. Relationship status was significantly related to one month follow-up use of contraceptives (\( \chi^2 = 8.056, DF = 2, p = .018 \)), suggesting that single women were less likely to report using contraceptives at one month follow-up, compared with women who identified as married or other.

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Follow-up Use of Contraception</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single/Not cohabitating</td>
<td>Yes: 15</td>
<td>No: 23</td>
</tr>
<tr>
<td>Married</td>
<td>Yes: 26</td>
<td>No: 12</td>
</tr>
<tr>
<td>Other</td>
<td>Yes: 38</td>
<td>No: 21</td>
</tr>
</tbody>
</table>

*Note. ***= \( p \leq .05 \)

Finally, Table 7 shows the relationship between the effectiveness of contraception type and one month follow-up use of contraception. The results are statistically significant (\( \chi^2 = 16.663, DF = 1, p = .000 \)), such that women who reported using an ineffective type of contraception at baseline (or not using any contraception) were more likely to report not
Table 7. Crosstabulation of Contraception Type and One Month Follow-up Use of Contraception for Treatment and Control Groups

<table>
<thead>
<tr>
<th>Contraception Type/Effectiveness</th>
<th>Follow-up Use of Contraception</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Using/Not Effective</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Using/ Somewhat-to-Very-Effective</td>
<td>73</td>
<td>36</td>
</tr>
</tbody>
</table>

*Note.*** = \( p \leq .001 \)

using contraception at one month follow-up, compared to women who reported using effective types. Women who reported using more effective contraceptive types (such as the pill, shot, or IUD) were more likely to report using some type of contraception at one month follow-up, compared with women who used ineffective types.

**LOGISTIC REGRESSION**

A logistic regression was performed for one month follow-up use of contraception, using group assignment, ethnic group, relationship status, effectiveness of contraception, and baseline use of contraception as covariates. While ethnicity was not shown to be significantly related to contraception use at one month follow-up in the univariate analysis, it was included in this model due to its history of significance in past research (Baldwin et al., 2008; Garces-Palaci et al., 2008). A summary of the results can be found in Table 8.

Holding all other variables constant, the relationship between group assignment and follow-up use of contraception was not significant (OR=.528; 95% CI=.236, 1.185; \( p = .122 \)). Non-significant effects on the outcome variable were found for ethnic group (OR=.534; 95% CI=.226, 1.260; \( p = .152 \)), relationship status (OR=.957; 95% CI=.380, 2.412; \( p = .926 \)) and the effectiveness of contraception type (OR=.666; CI=.169, 2.624; \( p = .561 \)). Baseline use of
Table 8. Logistic Regression Analysis for Variables Predicting Use of Contraception at One Month Follow-up, Controlling for Baseline Use of Contraception, Type of Contraception, Ethnic Group, and Relationship Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>e^B</th>
<th>95% CI</th>
<th>df</th>
<th>χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Group</td>
<td>-.638</td>
<td>.412</td>
<td>.528</td>
<td>[.236, 1.185]</td>
<td>1</td>
<td>2.395</td>
<td>.122</td>
</tr>
<tr>
<td>Ethnic Group</td>
<td>-.627</td>
<td>.438</td>
<td>.534</td>
<td>[.226, 1.260]</td>
<td>1</td>
<td>2.052</td>
<td>.152</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>-.044</td>
<td>.472</td>
<td>.957</td>
<td>[.380, 2.412]</td>
<td>1</td>
<td>.009</td>
<td>.926</td>
</tr>
<tr>
<td>Type of Contraception</td>
<td>-.406</td>
<td>.700</td>
<td>.666</td>
<td>[.169, 2.624]</td>
<td>1</td>
<td>.337</td>
<td>.561</td>
</tr>
<tr>
<td>Baseline Contraception</td>
<td>-</td>
<td>.581</td>
<td>.151</td>
<td>[.048, .471]</td>
<td>1</td>
<td>10.603</td>
<td>.001*</td>
</tr>
<tr>
<td>Constant</td>
<td>1.892</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>9.914</td>
<td>.002*</td>
</tr>
</tbody>
</table>

Note. CI=confidence interval; *= p < .05

-2 Log likelihood= 149.522

contraception was significantly related to use of contraceptives at follow-up (OR=.151; CI=.048, .471; p = .001), such that women who used contraception at baseline were 6.6 times as likely to use contraception at follow-up, compared with women who did not use contraception at baseline.

**SECONDARY FINDINGS**

The relationship between alcohol consumption and use of contraception at follow-up was non-significant (Table 9). Women who reported drinking high levels of alcohol at baseline did not report using contraception more or less than women who drank moderate levels of alcohol.
Table 9. Crosstabulation of Baseline Drinking Category and Follow-up Use of Contraception

<table>
<thead>
<tr>
<th>Drinking Category</th>
<th>Follow-up Use of Birth Control</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>High</td>
<td>37</td>
<td>32</td>
</tr>
<tr>
<td>Moderate</td>
<td>40</td>
<td>23</td>
</tr>
</tbody>
</table>

*Note. a= p > .05*
CHAPTER 4

DISCUSSION

The purpose of this study was to analyze the potential impact of a web-based alcohol intervention on the contraceptive habits of 150 low-income women in the San Diego area. Use of contraception was low compared with national averages (Mosher & Jones, 2010). Approximately 66% of women who participated in the study were actively using a method of contraception at the time of baseline measurement, compared with an estimated range of 62-89% of fertile, non-pregnant women in the U.S. (Drescher-Burke, 2008; Mosher & Jones, 2010). Only 16% reported using a method considered very effective. These findings do not support findings from past researchers that women of low socioeconomic status are less likely to engage in preventive contraception measures compared with their more affluent peers (Drescher-Burke, 2008). However, this depends on accuracy of reporting method and understanding of the question. For instance, at least 20 women in this study reported not using any form of contraception, but chose a contraception method when asked which type they used. This suggests that the question may not have been worded clearly, or that women may not have been paying close attention. The majority of women in this study were educated at the high school level or below; approximately 40% of women having achieved post-high school education. Income level was not directly measured, as all women were considered to be low-income based on the eligibility requirements for WIC services (an income at or below 185% of the U.S. Poverty Income Guidelines).

The first hypothesis, that more women in the treatment group would report using a form of contraception at one month follow-up, compared with women in the control group,
was not supported in this study. The second hypothesis was also not supported by our results; there was no significant relationship between alcohol consumption and use of contraception at one month follow-up.

Possible explanations for lack of support for both hypotheses include the context of sexual encounters, partner status, time of reporting or a change in desire for pregnancy during the study. Research has shown the connection between drinking and contraception use to have a contextual aspect, in that the strength of the relationship may increase or decrease depending on the relationship between the woman and her sexual partner (Leigh, 2002). For example, alcohol may not influence condom use among women when a new partner is involved (Leigh, 2002). Additionally, the 2002 Project Choices AEP intervention (which focused on both decreasing alcohol use and increasing contraception use), highlighted the complex relationship between these two behaviors. Women who had low levels of baseline drinking were more successful at increasing their contraceptive use, likely because they viewed it as their ‘problematic’ behavior, and not their drinking (Fabbri et al., 2009). In the current study, several women in both the treatment and control groups changed their contraceptive behavior, but in the unexpected direction--of the 90 women who reported using contraceptives at baseline, 23 reported not using them at one month follow-up. There are many possible explanations for this phenomenon, unrelated to our intervention. For instance, these women may use contraceptives infrequently, and thus change their self-report depending on their most recent sexual encounter (Frost et al., 2007). Or perhaps these women had a lifestyle change between baseline and one month follow-up that impacted their contraceptive behavior (such as a relationship change, desire to become pregnant, etc) (Besculides & Laraque, 2004). Of the 23 women who reported using contraception at
baseline, but not at one month follow-up, five underwent a relationship change between measurement times. Of the 29 women who reported using a “very effective” method of contraception at baseline, only one stopped using contraception at one month follow-up. And none of the women who were using contraception at baseline became pregnant between baseline and one month follow-up. We did not ask participants about their desire to become pregnant, or for any other possible reasons for the change in contraception use.

It is worth noting that the intervention program was not intended to change contraceptive behavior directly. The intervention was designed to impact alcohol consumption, using personalized feedback about the dangers of alcohol use, especially as they relate to the risk of fetal alcohol syndrome. In Delrahim-Howlett’s 2010 dissertation using this dataset, the effect of the intervention program on alcohol consumption was found to be borderline significant. No significant relationship was found in this study between alcohol use and contraception use. Based on the theory that risky behaviors are correlated, and that decreasing one risky behavior (alcohol consumption) should lead to a decrease in other risky behaviors (unprotected sexual intercourse), it is not surprising that contraceptive use was not greatly impacted, due to the non-significant decrease in alcohol consumption.

Another possible explanation for the results of our main hypothesis may come from the study design itself. Women in both the treatment and control group were provided with information about fetal alcohol syndrome and the dangers of alcohol and pregnancy. They were asked about their contraceptive behavior at baseline and one month follow-up. It is possible that the changes reported may have been the result of our assessment and FAS information, which was given to both the treatment and control groups. It is possible that the brief information provided about the dangers of alcohol use during pregnancy may itself have
practical significance in leading women to change their contraceptive behavior, regardless of group placement. This could result in either a positive or negative change in contraceptive behavior, depending on the participants’ view of their risk.

Results from the logistic regression provided additional information concerning the potential impact of other variables on contraception use. These results, regarding ethnicity, relationship status, and type of contraception, are consistent with findings from past studies (Garces-Palacio et al., 2008). Women who self-identified as white/Caucasian were more likely than non-white women to report using a form of contraception at follow-up. In past research, the relationship between ethnicity and contraceptive use has been related to socioeconomic status (SES). All women were of similar SES, based on the income requirements for use of WIC services. However, actual income was never directly assessed, making it difficult to establish a more specific relationship between SES and ethnicity in this study. With that information we could examine whether the impact of ethnicity on contraception use is due to economic factors, or if it might be more culturally-related.

Married women did not differ significantly from non-married women in their use of contraception at follow-up, when controlling for ethnicity, contraceptive type, and baseline contraception use. This is contrary to findings by Besculides and Laraque (2004), which stated that unmarried women are more likely to have an unintended pregnancy, compared with married women. This may be a result of study design and interpretation, as the variable for Relationship status did not explicitly ask women if they were “Married” or “Non-married.” Response options were more varied and accommodated a multitude of relationship styles and possibilities. For analysis purposes these categories were collapsed into Married
and non-married. It would be difficult to compare the impact of relationship status in this study versus past studies, if the methodology and response options differed dramatically.

Baseline contraception use was strongly related to one month follow-up contraception use, in that the number of women who changed their contraceptive behavior was not strongly significant. Similarly, the type of contraception used at baseline was significantly associated with contraception use at one month follow-up. Women who reported not using any contraception (considered an “ineffective” type) also reported not using contraception at one month follow-up. Women who used more effective methods were more likely to report using them at one month follow-up; this is especially true of women with semi-permanent methods (such as IUD implants). Future efforts at decreasing alcohol-exposed pregnancies might wish to highlight the effectiveness of such contraception methods.

**Relation to the HBM**

Using the theoretical basis of the HBM, the non-significant impact of the intervention on contraception use indicates that the intervention did not adequately improve perceived benefits, increase perceived threat, reduce perceived barriers, or increase cues to action (Glanz et al., 2008). While knowledge of the dangers of alcohol use during pregnancy was measured, it was not analyzed in this study. That information was only assessed at baseline, and not during either of the follow-up periods. Thus, an increase in knowledge (another construct of the HBM) could not be measured and was consequently outside the scope of this study. Additionally, participants’ perceived benefits, barriers, threat, and cues to action were not measured. The intervention feedback was designed to impact those constructs, but no evaluation or measurement was included. Researchers evaluating the effectiveness of this intervention using the HBM would need additional data to make informed conclusions.
LIMITATIONS AND FUTURE DIRECTIONS

There is an element of social desirability inherent in questions about sexual practices, which makes it difficult to assess actual behavior change using self-report. If participants deemed it socially desirable to report contraceptive use, this may have impacted either their actual behavior or their willingness to respond negatively. This likely would have impacted both the treatment and control groups equally, although it is possible that the personalized feedback given to treatment group members increased the potential shame associated with reporting risky behaviors. However, efforts were made to decrease any discomfort related to discussing such sensitive subjects. Participants were contacted via phone, instead of in person, to increase anonymity and feelings of confidentiality. Similarly, there is evidence that women were not accurately reporting their contraception use at baseline. This makes it difficult to truly assess the impact of the intervention.

As stated previously, the intervention was not designed specifically to reduce instances of unsafe sex. Its primary outcome of interest was reducing alcohol consumption. It was considered both possible and desirable to also increase contraception use, in an effort to identify all potential strengths and uses of the eCheckUp program. With a modification to the program, supplementing the feedback portion with information about contraception, for example, more pronounced behavior changes may be expected. Future researchers would benefit from including more questions relating specifically to contraception. For instance, when discussing women who made negative changes to their contraceptive behavior, it would be helpful to know their reasons for not using contraception at one month follow-up. This could be captured using categorical options, which would be identified through formative research or a pilot investigation of women in the target population. Similarly, there
should be a question assessing the frequency of contraception use or the frequency of using different types of contraception.

In order to adequately evaluate the impact of the intervention feedback on specific constructs of the HBM, additional questions could be included at baseline and follow-up. Specifically, participants could be asked at baseline and follow-up about their perceived threat of an AEP, benefits of reducing their risk, and barriers to reducing their risk. Researchers could also attempt to assess the method by which participants are most receptive to AEP knowledge. This will help tailor the cues to action to the specific population. For example, it may be possible that this population does not respond well to written information (due to low literacy levels or knowledge of English) and needs a more interactive or authoritative cue to action. These participants might also require more time between follow-up, and more frequent cues to action (in the form of phone call reminders, or possibly text messages). Similarly, it could be useful to include knowledge questions at follow-up, to determine whether or not the intervention increased participant knowledge of the dangers of AEP.

CONCLUSIONS

The results of this study support many past findings regarding the contraceptive behavior of low-income women (Drescher-Burke, 2008). There were no results to adequately confirm research showing correlations between risky behaviors. However, the program was well-received by women and resulted in some promising behavior changes overall. With a few slight modifications, including specialized focus on contraception use and additional evaluation questions, the eCheckUp web assessment program may be a useful tool in the prevention of FAS.
BIBLIOGRAPHY

WORKS CITED


**WORKS CONSULTED**


APPENDIX A

SCREEN SHOT OF SAMPLE ASSESSMENT
Welcome to the California WIC Program Alcohol eCHECKUP TO GO

The Alcohol eCHECKUP TO GO (e-CHUG) is a brief assessment that provides you with helpful information about your use of alcohol and your health. In addition, this program has specific information about helpful resources in the San Diego community to keep you and your family healthy.

ALL of your answers are CONFIDENTIAL.

This unique Alcohol eCHECKUP TO GO program was purchased for the exclusive use of, and tailored to, the California WIC Program community. If you are not a member of the California WIC Program, please do not proceed on this site. More info...

Disclaimer

This is not an official California WIC Program web site. Although descriptive and statistical information about California WIC Program has been provided by California WIC Program officials, the Alcohol eCHECKUP TO GO (e-CHUG) program is owned, operated, and maintained by the San Diego State University, Research Foundation. If you have questions about this program’s use at California WIC Program, please contact Kaita Darwish Hovart, MPP, MBA (kaita@projects.sdsu.edu).
**Instructions**

Please answer all questions and answer them honestly.

ALL answers are CONFIDENTIAL. Your name is not attached to this form and no personally identifiable information from this survey will be stored. Answering each question accurately will give you realistic feedback regarding your health.

**Your Research Code**

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<td>XX</td>
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<tr>
<td>Examples:</td>
<td></td>
</tr>
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<td>For &quot;Linda&quot; enter &quot;LI&quot;</td>
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<tr>
<td>For December 21st enter &quot;1221&quot;</td>
<td></td>
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<tr>
<td>Last 4 digits (numbers) in your phone number</td>
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<td>Your weight today</td>
<td>Pounds (lbs.)</td>
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<td>Your height today (in feet/inches)</td>
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<tr>
<td>Counting from first grade, how many years of school did you finish?</td>
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### Health Information

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<td>prescribed by your doctor?</td>
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</tr>
<tr>
<td>Other than birth control, are you currently taking any medications</td>
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</tr>
<tr>
<td>NOT prescribed by your doctor?</td>
<td></td>
</tr>
<tr>
<td>Do you use any drugs that could be considered illegal, such as</td>
<td></td>
</tr>
<tr>
<td>marijuana, cocaine, methamphetamine, crack, etc.?</td>
<td></td>
</tr>
<tr>
<td>Total number of times you have been pregnant in your life</td>
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</tr>
<tr>
<td>(If pregnant now, include this pregnancy in the total)</td>
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<tr>
<td>Total number of living children</td>
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<tr>
<td>Do you use text messaging on your mobile (cell) phone?</td>
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INSTRUCTIONS

Now we will ask you a few questions about your past and current alcohol use.

Please answer the questions honestly, remember your answers are CONFIDENTIAL. Answering each question accurately will give you realistic feedback regarding your health. Your name and other personal information that could identify you will not be attached to this form.

About Your Drinking

1. Have you ever had alcohol to drink (beer, wine, liquor, tequila, etc.) in your life (more than a few sips)?

2. At what age did you first start drinking?

3. During the past month (30 days), how many days did you have 3 or more drinks on an occasion?

4. On the calendar, please write a number for each day beginning with yesterday and going backwards for
TWO weeks (14 days). To the best of your memory, fill in the NUMBER of DRINKS of alcohol you consumed you drank on that day.

It may be helpful to think back over the last two weeks and see if there were any special occasions or events (birthdays, parties) where you had something to drink.

On days when you did not have any alcohol to drink, you should enter “0”. On days when you did drink, please enter the total number of drinks you had. For example:

If you had 2 beers yesterday, write the number 2 for that day. If you drank two or more different kinds of alcoholic beverage in a day, such as 1 beer and 2 glasses of wine, you would write the number 3 for that day. Do this for all of the days on the calendar going backwards from today.

<table>
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<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
<th>Sat</th>
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<td>Apr 06</td>
<td>Apr 07</td>
<td>Apr 08</td>
<td>Apr 09</td>
</tr>
<tr>
<td><strong>Apr 10</strong> TODAY</td>
<td>Apr 11</td>
<td>Apr 12</td>
<td>Apr 13</td>
<td>Apr 14</td>
<td>Apr 15</td>
<td>Apr 16</td>
</tr>
</tbody>
</table>

☐ Decline to Answer

5. How much money would you estimate you spend on alcoholic beverages per week? Or, if someone else buys your alcohol for you, how much money do you estimate that they spend?

$$_{ }$$

☐ Decline to Answer
Instructions

Now, please answer the following questions.

What is Your "Typical Drink"?

What type of alcoholic beverage did you typically drink in the last month? (Click the picture.)

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Instructions

Now, please answer the following questions.

What is Your "Typical Drink"?

You stated that you typically drink wine. Please look at the pictures and choose the one that looks most like the type of wine glass you usually drink from.

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Instructions

Now, please answer the following questions.

What is Your "Typical Drink?"

Please select which size container do you typically use, or what amount do you typically drink? (Click the picture.)

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INSTRUCTIONS

Now, please answer the following questions.

What is Your "Typical Drink"

Thank you. Click "NEXT" to continue.
INSTRUCTIONS

Please answer all questions and answer them honestly.

ALL answers are CONFIDENTIAL. Your name is not attached to this form and no personally identifiable information from this survey will be stored. Answering each question accurately will give you realistic feedback regarding your health.

When answering the following questions, please think about the past year.

1. How many drinks does it take for you to feel high (tipsy or buzzed)?

2. Have people annoyed you by criticizing your drinking?

3. Have you ever felt you ought to cut down on your drinking?

4. Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?
5. Think about the NUMBER of your BLOOD RELATIVES who have problems with drinking alcohol (i.e. drink too much/alcohol)? For each type of relative listed below, enter the NUMBER who have problems with drinking alcohol. If no relatives have problems, enter "0" (zero).

- Parents
- Brothers and Sisters
- Grandparents
- Uncles or Aunts
- Cousins

☐ Decline to Answer

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v3.6 10 April, 2011 11:03am
INSTRUCTIONS

Please answer the questions honestly, remember your answers are CONFIDENTIAL. Answering each question accurately will give you realistic feedback regarding your health. Your name and other personal information that could identify you will not be attached to this form.

Alcohol Knowledge and Risk Factors

1. When a woman drinks alcohol when she is pregnant, the alcohol enters the baby's bloodstream.
   - True
   - False
   - Decline to Answer

2. Women are at a greater risk for developing alcohol-related problems than men.
   - True
   - False
   - Decline to Answer

3. Just having a FEW drinks during pregnancy is safe for the baby.
   - True
   - False
   - Decline to Answer
4. Babies of women who drink alcohol during pregnancy are at risk for developing physical, mental and behavioral problems.
   - True
   - False
   - Decline to Answer

5. Drinking alcohol is OK during the last trimester of pregnancy.
   - True
   - False
   - Decline to Answer

6. On average, you drink more than other women your age in the U.S.
   - True
   - False
   - Decline to Answer

7. If a pregnant woman drinks before she knows she is pregnant, she can have a child with an Alcohol Related Birth Defect.
   - True
   - False
   - Decline to Answer

8. During the PAST MONTH, how many cigarettes did you smoke on a typical day?
   (If you do not smoke, enter '0')
   - Cigarettes
   - Decline to Answer
9. If you're a smoker, for how many years have you smoked regularly?
(if you do not smoke, enter '0')

☐ Years
☐ Decline to Answer

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APPENDIX B

SCREEN SHOT OF SAMPLE TREATMENT FEEDBACK
YOUR DRINKING PATTERN

On average you reported drinking 12 drinks per week in the last two weeks.

This equals an average of 18 standard drinks per week in the last two weeks based on the picture you chose that looks like the typical drink you have.

You typically drink 7.5 oz. of wine in a red wine glass. That is equal to 1.5 standard drink(s).

Some alcohols are stronger than others. In order to help you get an idea of what and how much you consume, we have converted your drinking pattern into standard "one drink" units. In this system, "one drink" contains one-half ounce of pure alcohol and is equivalent to:

- 10-12 ounces of beer (5% alcohol)
- 4-5 ounces of table wine (12% alcohol)
- 1.25 ounces of 80 proof liquor (40% alcohol) or
- 1 ounce of 100 proof liquor (50% alcohol)

Health and social problems can occur when people drink too much. Current research indicates that adult women who drink three (3) or more standard drinks on any given day within a two-week period are at higher risk for these types of problems.
How much is too much?

Your drinking profile only tells part of the story and your drinking behavior is important.

It is not healthy, for example, to "save" all of your drinking for the weekend. Consuming small amounts (1-2 drinks) frequently is actually less risky than consuming large amounts (4-5 drinks) infrequently. For some people, however, even 1-2 drinks would be too many. Some people even find that they are unable to drink moderately and having 1-2 drinks can make them drunk or sick.

Some people should avoid alcohol entirely. For example, pregnant women should avoid alcohol because even small amounts can harm the unborn child. Other health problems (such as liver disease) make even moderate drinking unsafe.

It is never safe to drive after drinking any alcohol.

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The Cost to You

You reported that you (or whoever buys alcohol for you) spend(s) $2000.00 on alcohol every year.

Did you know...
By volume, alcohol is more expensive than other drinks. It’s more expensive than water, soda, and milk.
It’s even more expensive than oil or gasoline!

If you had this money now, you could have purchased about:

- **23 weeks of groceries to feed a family of 4!**
  (The average cost of groceries for a family of four is $100.00 (USDA))

- **A $200.00 shopping spree for new clothes or shoes!**

- **13 birthday parties for your child(ren)!**
  (The average cost for a child’s birthday party is $200.00 (familycareer.com))

- **A family vacation to Disneyland for 3.2 day(s) for a family of four!**
  (The average cost for a family vacation to Disneyland is $600.00 per day (family; Fodor’s Travel Guide))
How Does Your Drinking Compare?

Did you know... only 48.1% of women in the US drink alcohol.

58.1% of women in the US who are about your age and of the same ethnic background drink less than you.

This tells you what percent of American women drink less than you in a typical month. This information is from a nationwide survey in the US (Behavioral Risk Factor Surveillance System (BRFSS) sponsored and conducted by the Centers for Disease Control and Prevention (CDC) in 2007).

The BRFSS is the world's largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the United States yearly since 1984. Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam.

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**Physical Costs**

How many ice cream cones did you drink in the last two weeks?

Each standard drink also contains approximately 115 calories. Given the number and types of drinks you reported drinking, in the last two weeks you drank about 4025 calories, or the equivalent of 35 ice cream cones.

If you ran at a pace of 6 miles per hour (a 10-minute mile) you would have to run for 5 hours and 33 minutes to burn off all of the calories you accumulated from drinking alcohol.
What you know about Alcohol & Your Body

Women are at a greater risk for developing alcohol-related problems than men.

You Said: FALSE
Answer: TRUE

With any health issue, accurate information is very important. There are times and ways to drink that are safer than others. Every woman is different. No amount of drinking is 100 percent safe, 100 percent of the time, for every woman. With this in mind, it’s important to know how alcohol can affect a woman’s health and safety.

Even in small amounts, alcohol affects women differently than men. In some ways, heavy drinking is much more risky for women than it is for men.

Why are lower levels of drinking recommended for women than for men? Because differences in the way a woman’s body works as compared to a man places women at greater risk than men for developing alcohol-related problems. A woman’s brain and other organs are exposed to more of the toxic byproducts from alcohol that result when the body breaks down and eliminates alcohol.

Some people should not drink at all, including:

- Anyone under age 21
- People of any age who are unable to restrict their drinking to moderate levels
- Women who may become pregnant or who are pregnant
- People who plan to drive, operate machinery, or take part in other activities that require attention, skill, or coordination
- People taking prescription or over-the-counter medications that can interact with alcohol
On average, you drink MORE than other women your age in the U.S.?

You Said:  FALSE  
Answer:  TRUE

Only 48.1% of women in the U.S. drink alcohol. Of those women who drink, only one out of ten (1/10) averages two or more drinks a day.

For women, two drinks a day is above what the Dietary Guidelines for Americans call "moderate," which recommends no more than one drink a day for women. Young women in their 20's and early 30's are more likely to drink than older women. No one factor predicts whether a woman will have problems with alcohol, or at what age she is most at risk.

The guidelines for moderate drinking form part of the Dietary Guidelines for Americans issued jointly by the U.S. Department of Agriculture and the U.S. Department of Health and Human Services. (The Dietary Guidelines can be viewed on-line at the website www.nutrition.gov) The Guidelines point out that drinking more than one drink per day for women or two drinks per day for men can raise the risk for motor vehicle crashes, other injuries, high blood pressure, stroke, violence, suicide, and certain types of cancer.

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What you know about: Alcohol & Pregnancy

You got 2 out of 5 right!

- **When a woman drinks alcohol when she is pregnant, the alcohol enters the baby’s bloodstream.**
  - You Said: TRUE
  - Answer: TRUE

- **Just having a FEW drinks during pregnancy is safe for the baby.**
  - You Said: TRUE
  - Answer: FALSE

- **Babies of women who drink alcohol during pregnancy are at risk for developing physical, mental and behavioral problems.**
  - You Said: FALSE
  - Answer: TRUE

- **Drinking alcohol is OK during the last trimester of pregnancy.**
  - You Said: FALSE
  - Answer: FALSE

- **If a pregnant woman drinks before she knows she is pregnant, she can have a child with an Alcohol Related Birth Defect.**
  - You Said: FALSE
  - Answer: TRUE

When you are pregnant, everything you eat and drink while you are pregnant affects your baby. So you should be very careful about what you eat and drink so that you and your baby will be healthy. If you drink alcohol, it can hurt your baby’s growth. Your baby may have physical and behavioral problems that can last for the rest of his or her life. Children born with the most serious problems caused by alcohol have fetal alcohol syndrome.
Fetal Alcohol Syndrome

Fetal alcohol syndrome (FAS) is the most common known preventable cause of brain damage. Babies with FAS have clear changes in the way that their face looks and they may be born small. The brain damage that occurs with FAS can result in lifelong problems with learning, memory, attention, and problem solving. These alcohol-related changes in the brain may be present even in babies who look and grow normally.

It is not known if there is any safe drinking level during pregnancy; nor is there any stage of pregnancy in which drinking—at any level—is known to be risk free.

If a woman is pregnant, or wants to become pregnant, she should not drink alcohol. Even if she is pregnant and already has consumed alcohol, it is important to stop drinking for the rest of her pregnancy. Stopping can reduce the chances that her child might be harmed by alcohol.

- No amount of alcohol consumption can be considered safe during pregnancy.
- Alcohol can damage a baby at any time during pregnancy.
- If you drank alcohol before you knew you were pregnant, stop drinking now. You will feel better, and your baby will have a good chance to be born healthy. If you want to get pregnant, do not drink alcohol.
- There are many ways to help you stop drinking. You do not have to drink when other people drink. If someone gives you a drink, it is OK to say no. Stay away from people or places that make you drink. Do not keep alcohol at home.
- It is never too late to stop. Look for help to quit.

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**Personal Risk Factors**

There are several factors that may indicate your overall risk of developing alcohol-related problems. While there is no way to definitely predict whether a person will be harmed by alcohol or develop alcohol dependence, “high-risk” areas are areas to which you may want to give additional consideration in the future.

**Your Individual Risk**

Your individual Risk score is: **4 out of 5**.

Based on your Score, you have a **11.7%** likelihood of risky-drinking.

Your individual risk was calculated using a risk assessment ‘score card’ especially developed for women who could get pregnant. On a scale ranging from 0 to 5, a score of 2 or more is considered positive for risky-drinking (for example, alcohol use that can potentially harm an unborn child).

**Your Family Risk**

Your family risk level is: **3**.

Based on your family risk level, your risk of developing future alcohol dependence or related problems is: **medium**.
People with a history of alcohol or drug problems among their blood relatives are at higher risk themselves. This may happen through either inheriting a higher tolerance or a sensitivity to alcohol. The more relatives with alcohol problems you have, the higher your risk for problems with alcohol.

Your risk increases if your relatives with alcohol problems are the same gender and/or are more closely related.

Your score is calculated based on the National Institute on Alcohol Abuse and Alcoholism's Project MATCH criteria.

Early alcohol users are more likely to be alcohol dependent

You said that you began drinking alcohol at age 16. In an analysis of data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), early alcohol users were more likely to develop alcohol dependence at a later age. Nearly one-half (47%) of persons who began drinking before age 14 were alcohol dependent at some point in their lifetime, and 13% were dependent in the past year, compared to 9% and 2%, respectively, of those who began drinking after age 20.

While it is not yet known if drinking at an early age actually causes later alcohol problems, there is a clear relationship between early alcohol use and later alcohol problems and dependency. These data suggest that delaying drinking may reduce your risk of later alcohol problems and dependency.

Adapted by CESAR from Hingson, R.W., Heeren, T., and Winter, M.R. Age at Drinking Onset and Alcohol Dependence, Archives of Pediatrics and Adolescent Medicine160(7):730-739, 2006. Available online at archped.ama-assn.org/cgi/reprint/160/7/739. For more information, contact Dr. Ralph Hingson at rhingson@mail.nih.gov.
Making Changes

What strategies do people use to cut down their drinking?

If you are pregnant or think you may be pregnant, **STOP** drinking or obtain help if you don’t feel you can do it by yourself.

If you are not pregnant:

- Space your drinks over time.
- Alternate drinking non-alcoholic and alcoholic drinks.
- Set a drinking limit or less than 2 drinks before you start.
- Count the number of drinks you have.
- Rehearse saying ‘no thanks’ when offered a drink you don’t want.
- Spend more time with friends who don’t drink.

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RESOURCES

Thank you for your participation in our research project! Please see more resources and numbers you can call below...

If you have any questions or concerns about the research, please feel free to contact Dr. Christina Chambers at 619-294-3761 OR Dr. John Clapp at 619-222-2336.

If you need information about the effects of alcohol and other drugs during pregnancy:

Call the Pregnancy Risk Information Line
1-800-532-3749

If you need help quitting alcohol, tobacco, or drugs:

Call the UCSD Perinatal Case Management and Street Outreach Program
1-858-514-7545

If you need help to start prenatal care, assistance in applying for Medi-Cal and other resources in the community:

Call the Perinatal Care Network
1-800-975-2229
Referral information about Alcoholics Anonymous can be obtained by visiting AASanDiego.org or by contacting the San Diego AA Central Office at (619) 255-6762 (7975 Mission Gorge Road, Suite B, San Diego, CA 92120). Other treatment options (such as SMART Recovery) may also be available.

Additional information can be found on-line at:

- Center for Disease Control, Tobacco Information and Prevention Sourcepage
- Cocaine Anonymous
- Mothers Against Drunk Driving
- Narcotics Anonymous
- National Clearinghouse for Alcohol and Drug Information
- National Council on Alcoholism and Drug Dependence
- National Institute on Alcohol Abuse and Alcoholism
- National Institute on Drug Abuse
- National Women’s Health Resource Center
- Office of Minority Health Resource Center

CREDITS

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APPENDIX C

SCREEN SHOT OF SAMPLE CONTROL

FEEDBACK
SOME IMPORTANT THINGS YOU SHOULD KNOW

No amount of drinking is 100 percent safe. 100 percent of the time, for every woman. There are times and ways to drink that are safer than others. In some ways, heavy drinking is much more risky for women than it is for men. Every woman is different.

With this in mind, it’s important to know how alcohol can affect a woman’s health and safety. Why are lower levels of drinking recommended for women than for men? Because differences in the way a woman’s body works as compared to a man places women at greater risk than men for developing alcohol-related problems. A woman’s brain and other organs are exposed to more of the toxic byproducts from alcohol that result when the body breaks down and eliminates alcohol.

Some people should not drink at all, including:

- Anyone under age 21
- People of any age who are unable to restrict their drinking to moderate levels
- Women who may become pregnant or who are pregnant
- People who plan to drive, operate machinery, or take part in other activities that require attention, skill, or coordination
- People taking prescription or over-the-counter medications that may not be good to take with alcohol.

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WHEN YOU ARE PREGNANT...

DRINKING CAN HURT YOUR BABY

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- National Institute on Drug Abuse
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- Office of Minority Health Resource Center

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