

Preventing Fetal Alcohol Spectrum Disorders:
An Evidence-Based Prevention Program for Adolescent and Adult Hispanic Females in the
South Texas Border Region

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Abstract

Fetal Alcohol Spectrum Disorders (FASD) present serious problems for the twenty-first century. These disorders describe a variety of neurological and behavioral deficits that result from exposure of an unborn child to alcohol during pregnancy. While thousands of children are diagnosed with FASD annually, FASD is completely preventable if women refrain from consuming alcohol while pregnant. The purpose of this study was to assess the effects of an evidence-based and culturally relevant FASD prevention program among adolescent and adult Hispanic females residing along the South Texas border with Mexico. All 239 youth and adult participants were concurrently receiving substance use intervention and/or treatment services from at least one of seven different programs operated by a single non-profit social services agency. The participants received the *Project CHOICES* intervention, which helps prevent alcohol-exposed pregnancies by focusing on reducing drinking and using contraception. The findings of this investigation indicated that women who successfully completed the FASD Prevention Program demonstrated increased effectiveness of birth control use and decreased use and abuse of alcohol. The empirical success of Project CHOICES and the FASD Prevention Program examined in this study serve as support for the goal of incorporating FASD information and contraceptive education into school-based recovery programs and community-based substance abuse intervention and treatment programs for adolescent and adult females. (Contains 2 tables)

Keywords: Fetal Alcohol Spectrum Disorder (FASD); Alcohol-exposed pregnancies; Alcohol prevention program; Adolescent and adult Hispanic females; South Texas border with Mexico; Community-based substance abuse intervention and treatment; School-based substance abuse intervention and treatment

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Although the consumption of alcohol has existed in cultures and societies across the millennia of civilization, the first clinical reports describing fetal alcohol syndrome (FAS) did not occur until the early 1970s (Thomas, Warren, & Hewitt, 2010). These researchers identify three diagnostic criteria for FAS which include distinct patterns of facial dysmorphology, growth deficiencies, and dysfunction of the central nervous system. Through the years, many terms have been used to describe the effects caused by perinatal exposure to alcohol including partial FAS and alcohol-related birth defects; however, today, the term fetal alcohol spectrum disorders (FASD) is the umbrella term used to acknowledge that the adverse effects take place across a broad spectrum (Thomas et al., 2010). FASD refers to a variety of disabilities that may occur in individuals whose mothers drank alcohol while they were pregnant, resulting in disabilities that are wide ranging and can affect an individual's physical, mental, and behavioral well-being (Fetal Alcohol Spectrum Disorders Center for Excellence, 2007).

Following the publication of the first clinical reports in the early 1970s, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) conducted their first research projects investigating fetal alcohol syndrome and the relationships between fetal alcohol exposure, birth defects, and educational limitations and disabilities. The primary purpose of the NIAAA research was to determine if alcohol was a teratogen – a substance that has the ability to adversely affect the development of a fetus (Thomas et al., 2010). The NIAAA research subsequently resulted in scheduling a workshop on fetal alcohol syndrome in 1977. At this workshop, researchers collectively agreed that the public needed to be informed that alcohol could harm the development of a fetus (Thomas et al., 2010). The prevalence of FAS in the United States has been reported at a rate from 0.2 – 2.0 per 1,000 live births, and for FASD the rate is considerably

higher at 9.1 per 1,000 live births (Davis, Desrocher, & Moore, 2011). Determining the exact prevalence of FASD is challenging as many children with FASD are often diagnosed with other disorders such as hyperactivity, attention deficit, specific learning disabilities, oppositional defiant disorder and conduct disorder (Thomas et al., 2010).

Detrimental effects of any level of prenatal binge drinking on the cognitive development of infants and children ages six months to 14 years are demonstrated in a recent meta-analysis investigation (Flak, Su, Bertrand, Denny, Kesmodel, & Cogswell, 2014). The researchers combined and analyzed the data collected from 1,593 investigations and found statistically significant ($p < .05$) detrimental associations between moderate prenatal alcohol exposure and the behavior of the child. Furthermore, they found a positive relationship between mild-to-moderate prenatal alcohol exposure and the child's level of cognitive functioning. The findings of Flak and her colleagues (2014) support previous empirical evidence of the detrimental effects of prenatal binge drinking on child cognition and that prenatal alcohol exposure at levels less than daily drinking are likely associated with problems, delays, and disabilities in child behavior. Like all similar investigations, the results of this meta-analysis highlight the importance of abstinence from binge drinking during pregnancy and educating women of the fact that no reliable research has yet discovered a specific level of prenatal alcohol consumption that is safe for the child.

Alcohol Consumption

The FASD Center for Excellence (2007), which is no longer being funded but previously fell under the authority of the U.S. Department of Health and Human Services, emphasized that FASD can be completely prevented if women do not consume alcohol while they are pregnant. Although children with FASD most likely had mothers who consumed large amounts of alcohol while pregnant, research has demonstrated that numerous adverse medical and mental health outcomes have occurred in children whose mothers consumed lower levels of alcohol during

pregnancy (Walker, Darling-Fisher, Sherman, Wybrecht, & Kyndely, 2005). In the United States, it is estimated that more than 125,000 pregnant women annually consume alcohol at levels that could result in a child being born with FASD (Walker et al., 2005). Women identified as being at very high risk for bearing a child with FASD include those who drink while pregnant and that have a history of substance abuse or mental health problems, have multiple sex partners, are smokers, and have been recent victims of abuse and violence (Warren, Hewitt & Thomas, 2011). In a review of alcohol use and binge drinking among women of childbearing age in the United States from 2006-2010 (Centers for Disease Control and Prevention, 2012) it was estimated that 51.5% of non-pregnant women and 7.6% of pregnant women used alcohol in the past thirty days. Among non-pregnant women, binge drinking – having more than 4 drinks on one occasion – was reported at a rate of 15.0% in these women compared to 1.4% among women who were pregnant (CDC, 2012). Pregnant women identified as being between 35-44 years of age (14.3%), white (8.3%), college graduates (10.0%), or employed (9.6%) had the highest estimates of reported alcohol use (CDC, 2012).

The 2012 CDC report indicates that age, employment status, and marital status are key characteristics in the drinking patterns among pregnant women in the United States. Pregnant women between 35-44 years of age were more likely to report any form of alcohol use (14.3%), while the finding was only 4.5% for pregnant women between 18-24 years of age. Pregnant women who were employed were more than twice as likely to report binge drinking compared to those who were not employed. Finally, this CDC review of empirical investigations found that unmarried pregnant women were also more than twice as likely to report binge drinking compared to married pregnant women (CDC, 2012). A more recently published review of existing empirical research (Tan, Denny, Cheal, Sniezek, & Kanny, 2015) found slightly higher percentages for alcohol use and binge drinking behavior among pregnant and non-pregnant women between the ages of 18 and 44. This 2015 meta-analysis found that 53.6% of non-

pregnant women and 10.2% of pregnant women used alcohol in the past thirty days. Among non-pregnant women, binge drinking was reported by 18.2%, while 3.1% of pregnant women indicated that they had engaged in binge drinking in the past thirty days. Among pregnant women, those who were ages 35 to 44 reported significantly ($p < .05$) higher prevalence rates of alcohol use (18.6%) than all other age groups. Furthermore, Tan and her colleagues (2015) found that the prevalence of binge drinking among non-married pregnant women was 4.6 times higher than the prevalence among married pregnant women.

A common finding of the 2012 review (CDC, 2012) and the 2015 meta-analysis (Tan et al., 2015) that is highly significant for educators and substance abuse prevention practitioners is that women who engaged in binge drinking in the period prior to conception were more likely to continue drinking after becoming pregnant than those women who did not report any binge drinking prior to getting pregnant. The authors of both reports emphasized the fact that many women who consume alcohol regularly are often not aware that they are pregnant until several weeks after conception. This has serious implications for prevention, intervention and treatment. Walker et al. (2005) indicate that, “60% of frequent drinkers were not aware of their pregnancy until after their fourth week of gestation, and 30% were not aware at 6 weeks of gestation” (p. 187). Thus, to prevent the significant consequences of FASD, women who consume alcohol regularly need to receive information about the importance of not consuming alcohol when pregnant (Walker et al., 2005). Moreover, these women also need to be encouraged to use effective birth control in a consistent and appropriate manner if they are consuming alcohol and engaging in sexual activity.

Recent state-level empirical findings strongly reinforce the need for substance abuse prevention and birth control education. In the State of Texas, alcohol is the primary drug of abuse in terms of dependence and treatment admissions (Maxwell, 2012). “In 2011, twenty-nine percent of all clients admitted to publicly funded treatment programs had a primary problem with

alcohol” (Maxwell, 2012, p. 6). Of these individuals admitted for treatment, 32% were female, which is a significant change from 1988, when women accounted for only 18% of alcohol admissions. In 2014, alcohol was identified as the drug most often used by school students in Texas (Texas Department of State Health Services, 2014). Moreover, in this same year, more than half (50.5%) of all Texas school students surveyed reported using alcohol at least once in their lifetimes (Texas Department of State Health Services, 2014). While this percentage is alarming, it actually represents a decline of 7 percent from 2012 (Texas Department of State Health Services, 2014).

To help combat the problem of alcohol and other drug use and abuse by school students, recovery high schools are being established in cities across Texas. Recovery high schools focus on providing services to students that have taken part in or are currently participating in substance abuse treatment services with the aim of helping them avoid alcohol and other drug use or exposure (Vogel, 2009). The Association of Recovery Schools (2016) identifies three shared goals that are common to all recovery high schools: 1) provide education to eligible students that are recovering from a substance use or co-occurring disorder, 2) meet state requirements to award a secondary school diploma, and 3) provide ongoing recovery support to participating students. In addition to these goals, recovery high schools strive for small class sizes and usually have a counselor available that designates some part of each day to meet with or talk to students to help them deal with any issues or challenges (Vogel, 2009). In 2016, there are currently 8 recovery high schools in Texas, with only one located in South Texas (Association of Recovery Schools, 2016). Clearly strong emphases on substance abuse and FASD prevention are imperative among adolescent and adult females of childbearing years at national, state and local levels.

An Evidence-Based and Culturally Relevant FASD Prevention Program

The goal of the particular FASD Prevention Program of focus in this investigation was to reduce the incidence of FASD and the number of alcohol-exposed pregnancies among adolescent and adult Hispanic females in a region along the U.S.-Mexico border in South Texas. The FASD Prevention Program sought to create changes in the following key behaviors among the target population of adolescent and adult Hispanic females receiving substance abuse treatment and intervention services from a local non-profit social services agency: 1) increase abstinence from alcohol in non-pregnant women who are receiving substance use treatment services, and 2) increase the use of effective contraception among women who drink alcohol, are sexually active, and receiving substance use intervention or treatment services.

The target population for the FASD Prevention Program consisted of non-pregnant adolescent and adult Hispanic females (15 - 44 years of age) who were currently receiving substance abuse intervention or treatment services from a non-profit social services agency located in Southwest Texas along the border with Mexico. These females were identified as using alcohol and being sexually active, but were not using birth control regularly or at all. According to the U.S. Census Bureau (2010), there was a population of 250,304 living in the target county in South Texas, of which 95% of the population was of Hispanic origin, and more than 25% of the population lived below the poverty level.

The FASD Prevention Program staff members coordinated the delivery of *Project CHOICES* sessions to female clients. *Project CHOICES* (Changing High-Risk Alcohol Use and Increasing Contraception Effectiveness Study) is an evidence-based intervention that has been shown to effectively reduce alcohol-exposed pregnancies among women in high-risk situations due to risky drinking and ineffective or improper use of contraceptives (Floyd, Sobell, Velasquez, Ingersoll, Nettleman, Sobell, Mullen, Ceperich, Von Sternberg, Bolton, Johnson, Skarpness, & Nagaraja, 2007). *Project CHOICES* consists of four counseling sessions and a birth

control consultation that are provided to women at high risk for alcohol-exposed pregnancy (Project CHOICES Intervention Development Team, 2011a, 2011b). Those women who received relevant FASD information and short-term motivational counseling were significantly more likely to be at reduced risk for an alcohol-exposed pregnancy than their information-only control-group counterparts (Ceperich & Ingersoll, 2011). This supports the assertion that brief motivational counseling can significantly reduce the risk of an alcohol-exposed pregnancy. However, there is little empirical evidence which supports the effectiveness of educational information dissemination alone on reducing alcohol consumption or increasing contraceptive use (Hutton, Chander, Green, Hutsell, Weingarten & Peterson, 2014). Recent federal reports (Substance Abuse and Mental Health Services Administration, 2011, 2014) summarize the empirical evidence that brief counseling interventions, in conjunction with screening for substance use and sexual risk, can effect significant change in the positive direction in a variety of prevention and treatment settings (Floyd, Weber, Denny, & Connor, 2009; Hutton et al., 2014). Thus, over the past few years, *Project CHOICES* has become a model program that is well-respected by investigators as well as treatment providers (Ceperich & Ingersoll, 2011; Floyd, Ebrahim & Boyle, 1999; Ingersoll, Ceperich, Hetteema, Farrell-Carnahan & Penberthy, 2013)

The purpose of this investigation was to demonstrate how an FASD prevention curriculum could effectively be integrated into existing adolescent and adult outpatient and residential treatment services and outpatient intervention services. The criteria for assessing the effective integration of the FASD Prevention Program were the successful development of a reliable and valid prescreening tool, qualitative evidence that staff can be easily trained to screen and implement the prevention curriculum, and quantitative evidence that, as a result of program participation, the women would demonstrate a significant reduction in their alcohol consumption while simultaneously increasing their regular and effective use of contraception practices.

Method

Participants

A total of 239 Hispanic females, ages 15 – 44 years, participated in this investigation. None of the women were married, 10.0% were unmarried and cohabiting with a partner, 6.3% were widows, 2.5% were separated or divorced, 15.0% were adult women who had never married, and 66.2% were unmarried adolescent females. All youth and adult participants were concurrently receiving substance use intervention and/or treatment services from at least one of seven different programs operated by a single non-profit social services agency. This investigation was conducted in a county located along the southwest Texas-Mexico border and the target population consisted of low-income Hispanic females, 85% of whom were functionally bilingual in English and Spanish, while 15% read and/or spoke only Spanish. Based on the results of the prescreening device, from the initial pool of 239 women a total of 144 women qualified for program participation and 143 agreed to participate. This represents 59.8% of the total. To meet eligibility for program participation, the clients had to be within the age range of 15-44, they were not actively or regularly using contraception, they were neither pregnant nor attempting to get pregnant, and they used alcohol. The most common disqualifiers and eliminators were current pregnancy or intention to become pregnant ($n = 9$), surgical sterilization (tubal ligation) or biologically menopausal ($n = 13$), effective and regular contraception use ($n = 33$), not being sexually active ($n = 32$), or not engaging in risky alcohol consumption ($n = 22$).

The participants ranged in educational attainment levels from seventh grade education up to four-year college degree. The educational mode for this particular target group was 12th grade or GED completion with 51.2% of the women reporting this level of educational attainment. Additionally, 1.7% had only a junior high level education, while 3.3% indicated that they had earned four-year college degrees.

Instruments

Two assessment devices were used in this FASD Prevention Program. The *Project CHOICES* Prescreening Form (Fetal Alcohol Spectrum Disorders Prevention Program Staff, 2010) was developed by the FASD Prevention Program Staff members in cooperation with Northrop Grumman (the funding agency), and the complete *Project CHOICES* Screening Form, which was developed by the Northrop Grumman funded Project CHOICES Research Group (Ingersoll, Floyd, Sobell, Velasquez, Baio, Carbonari, J., . . . Zwiebel, J., 2003) and required for use in this project. Over the past decade, several studies have demonstrated the empirical and clinical reliability, validity and usability of the instrument (Floyd, Ebrahim, & Boyle, 1999; Ingersoll, Floyd, Sobell, Velasquez, et al., 2003; Velasquez, Ingersoll, Sobell, Floyd, Sobell, & Von Sternberg, 2010). The instrument items assess alcohol consumption, sexual behavior, and contraception use during the ninety-day period prior to the assessment. Individual client assessment interviews were conducted at baseline (intake), discharge (end-of-program), six-month follow-up, and twelve-month follow-up.

The *Project CHOICES* Prescreening Form (Fetal Alcohol Spectrum Disorders Prevention Program Staff, 2010) was a short screening form that contained six questions. This form asked women 1) to provide their date of birth; 2) to indicate if they had ever had their tubes tied, a hysterectomy, menopause, or both ovaries removed; 3) if they were currently pregnant; 4) if they had vaginal sex with a man in the past three months; 5) how many drinks containing alcohol they had consumed in the past three months; and 6) if they had four or more drinks containing alcohol on one day in the past three months. These six questions cover the primary qualifiers (and eliminators) for participation in the FASD Prevention Program and Project CHOICES (Ingersoll et al., 2003). The prescreening instrument requires less than five minutes to complete, and it does not require extensive training or knowledge base in order to administer and interpret. The prescreening device was created in a fashion such that following each question, the interviewer is

instructed as to the proceeding action. For example, the second item asks women if they have ever had their tubes tied, a hysterectomy, their ovaries removed, or have gone through menopause. The interviewer is then instructed to discontinue the assessment if the client responds “yes” to any of the procedures/conditions, and to continue the prescreening if the client responds “no” to all of the factors on this item. If the client indicates “yes” to the final item (#6), the interviewer is informed that the client does qualify for full screening for participation in the FASD Prevention Program; otherwise the client is disqualified from participation in the project.

Initially, the FASD Prevention Program Staff designed the English version of this brief one-page prescreening device by identifying the major elimination factors and addressing those primary disqualifiers. After creating the English version of this instrument, the staff conducted a sample administration of 14 professional employees of the umbrella agency to ascertain the accuracy of the disqualifying questions. The predictive accuracy of the prescreening device was 100%. Additionally, the instrument was sent to the Northrop Grumman Technical Assistance (TA) Liaison for input and approval, which was immediately granted. Then, the FASD Prevention Program Staff translated the instrument to Spanish (sensitive to the regional dialect) and employed a back-translation procedure for linguistic validity.

Instrument items cannot simply and literally be translated from English to Spanish without encountering serious threats to both instrument reliability and validity. Since the specific items on any survey or questionnaire are culturally anchored (Malda, van de Vijver, Scrinivasan, Transler, Sukumar, & Rao, 2008; Van de Vijver & Leung, 1997), the items which may be very appropriate for assessing a particular construct in one context may not be appropriate in other contexts. Language employs and reflects many subtle cultural differences, and these must be taken into consideration when translating an instrument from one language to another. One of the more widely accepted methods for accurately translating an assessment instrument is through the procedure of translation and back-translation (Sperber, Devellis, & Boehlecke, 1994). This

procedure involves having one committee of at least three translators first translate the instrument from English to Spanish, Then, without any discussion or exchange of information, a second committee (naïve of the original instrument or purpose) of at least three translators translates the Spanish version to English. A comparison of the original English version of the device with the back-translated English version will reflect the degree of translation validity and cultural relativity. Based on the instrument translation recommendations of Brislin (1970), the resulting product was one brief prescreening instrument (six items) in both English and Spanish, that upon sampling, maintained a predictive validity of $r = 1.0$ (100%).

The full *Project CHOICES* Screening Form (Ingersoll et al., 2003) is eleven pages in length and includes fifty-one questions to determine fertility status, current sexual behaviors, ineffective use of contraception, and risky consumption of alcohol (Project CHOICES Facilitator Guide, 2011b). This instrument takes about thirty to forty-five minutes to administer and a moderate level of training is required of the interviewer in order to ensure the reliability and validity of the screening process.

As a measure of program process, the *Adult and Youth Participation Evaluation* was used to assess participant satisfaction with the program and staff. This instrument was created by the FASD Prevention Program administration specifically for use in this project. The brief feedback survey consisted of six items in which participants were asked to rate how the level of helpfulness from “a lot” to “a little” to “not much.” These six primary questions were based directly on the key dependent variables of the project and the major topics included in the Project CHOICES curriculum. Two additional “yes or no” items were included on the survey asking participants whether or not they enjoyed participating in the program and whether or not they would recommend the program to friends and family members. This process evaluation device was then translated into Spanish so that both languages appeared on the same instrument. The

Adult and Youth Participation Evaluation was given to the clients at the end-of-program participation.

Treatment

Project CHOICES targets women who are at risk of having an alcohol-exposed pregnancy before they become pregnant. Damage to a fetus from drinking alcohol can occur at any stage of pregnancy, including the first trimester, when many women may not know that they are in fact pregnant (Davis, Desrocher & Moore, 2011; Project CHOICES Facilitator Guide, 2011b). The CHOICES curriculum focuses on reducing drinking and preventing pregnancy through contraception with women 18 to 44 years of age who are sexually active and drinking alcohol at risk levels (seven or more drinks per week or four or more drinks on one occasion). For this study, the funding agency granted permission to use Project CHOICES with youth 15 to 17 years of age. CHOICES is an evidence-based intervention curriculum that increases motivation and commitment to reduce or eliminate drinking and/or use contraception effectively. Through motivational interviewing methods (Ceperich & Ingersoll, 2011), Project CHOICES uses a four-session intervention: (1) Rapport building, review of alcohol and human reproduction, contraceptive methods, and making informed decisions about alcohol use and pregnancy; (2) Review daily journal, establish goals and change plan, and discuss temptation and confidence; (3) Discussion of contraception medical appointment, reactions to changing alcohol and birth control use, review of goals and change plan; and (4) Evaluation of program effectiveness, revision of personal goals, discussion of future plans for alcohol and birth control use, and making plans for keeping in touch over the next six months (Floyd, Sobell, Velasquez, Ingersoll, Nettleman, Sobell, Mullen, et al., 2007; Project CHOICES Facilitator Guide, 2011b). Motivational interviewing is a client-centered but directive style of counseling that seeks to overcome ambivalence exhibited by clients (Ceperich & Ingersoll, 2011; Center for Substance Abuse Treatment, 1999).

Project CHOICES consists of three phases of intervention: 1) screen and assess women for alcohol and contraception use, 2) provide women identified as being at risk for alcohol-exposed pregnancies with four counseling sessions, and 3) arrange a birth control consultation for the women with a health care provider (Floyd, Sobell, Velasquez, Ingersoll, et al., 2007; Hutton, Chander, Green, Hutsell, Weingarten, & Peterson, 2014). Program clients received services for an average duration of three months. Furthermore, an education session/presentation on the importance of preventing alcohol-exposed pregnancies was offered to all partners of clients in the program. The information provided focused on the dangers that alcohol exposure can have on a developing fetus and the benefits that can be derived from using contraception appropriately and consistently. Program services were primarily provided from 8:00 a.m. to 5:00 p.m. at the non-profit agency's residential treatment facilities and at the agency's main office.

Procedure

Adolescent and adult Hispanic females who were active clients in the umbrella agency's existing substance abuse intervention and treatment programs were prescreened as part of the regular intake process for their respective programs. If the client qualified as being "at-risk" on the *Project CHOICES* Prescreening Form, then the staff member administering the prescreening form subsequently referred the client – within 48 hours – to the FASD Prevention Program to be screened with the "full" *Project CHOICES* Screening Form. Following the administration of the full screening form, if the FASD Prevention counselor determined that the client did in fact qualify for participation in the FASD Prevention Program and was willing to voluntarily participate in program services, the client was formally admitted to the program.

In the initial implementation period, FASD Prevention Program Staff conducted brief training workshops for all cooperating intra-agency directors and staff ($n = 10$). These workshops provided training on the brief prescreening device, the full screening instrument, and the appropriate protocol for linking a qualifying client to the FASD Prevention Program staff.

The cooperating intra-agency staff conducted the prescreening of all female clients as part of the regular intake assessments for that particular program. If the client qualified as “at-risk” on the prescreening tool, then the staff member administered the full screening instrument. If the time required to conduct the full screening was an obstacle for the cooperating program, then the staff member referred the client for full screening to the FASD Staff. The FASD Counselor initiated contact with the referred client within 48 hours. If the FASD Counselor determined that the client qualified for participation in the FASD Prevention Program, and the client agreed to participate, then the cooperating intra-agency director was notified that the client would be accessing an additional program within the broader umbrella agency. If, after conducting the full screening instrument, the cooperating intra-agency staff member determined that the client did in fact qualify for participation in the FASD Prevention Program, that staff member employed motivational interviewing skills to describe the FASD Prevention Program to the client, secure client agreement to participate, and ensure a seamless referral process by personally introducing the client to the FASD staff.

Women who qualified for participation in the FASD Prevention Program based upon the results of the screening process received the CHOICES intervention. At the completion of the four counseling sessions and one contraception visit, the participants completed the end-of-program assessment. At that exit interview, extensive client tracking data was collected in order to locate the women when it was time for the 6-month and the 12-month follow-up interviews.

Research Design and Data Analyses

As previously indicated, the data for this study was collected as part of an externally funded grant program for preventing Fetal Alcohol Spectrum Disorder. Therefore, the authors were limited to employing a single-group pretest, posttest, and follow-up design. The 143 women who participated in the grant-funded prevention program were assessed on the dependent measures at intake (pretesting), exit (post testing), six months after exiting from the program (6-

month follow-up testing), and twelve months after exiting from the program (12-month follow-up testing). Statistical comparisons of the dependent measures for the single group across the different testing intervals were examined using the Statistical Package for the Social Sciences (SPSS) version 7.5 (1996) to assess the effects of the prevention education treatment program.

Results

Descriptive Findings

Analyses of the data collected during the screening interview provided a broader understanding of the sample of participants, as well as a snapshot of the particular population in the South Texas border region. Among the 143 women who completed the entire screening assessment, about 5% said that they had used the birth control pill within the past 90 days, 34% reported having used condoms in that same time period, 2% indicated that they had used an IUD device within the past 90 days, 4% said that they had used Depo-Provera within the previous 90 days, and 22% stated that they had not used any form of birth control over the past 90 days. None of the participants reported using emergency contraceptive methods during the 90 days prior to the screening assessment. At the time of the initial screening, eight women were pregnant, while 74.6% indicated that they had engaged in vaginal sex with a male partner at some point during the 90 days prior to assessment. Additionally, that same percentage (74.6%) indicated that they planned to engage in vaginal sex at some point in the next 90 days.

In order to be eligible for participation in the FASD Prevention Program, the women's intake assessments indicated that they were not using birth control effectively. Following the completion of the four motivational interviews and the contraceptive visit with the health care provider, at the end-of-program assessment the percentage of participants who reported using birth control effectively had risen to 29.6%. At the 6-month follow-up, that figure reflected a substantial increase to 89.7%. The percent of women who reported using birth control effectively at the 12-month follow-up decreased slightly to 84.2%. However, even a year after the initial

contact with the FASD Prevention Program more than four-fifths of the women were still practicing effective use of birth control.

About 19% ($n = 32$) of those women who completed the substance use portion of the initial assessment instrument reported being abstinent from alcohol for the thirty days prior to the date of intake. These women did not qualify to participate in the FASD Prevention Program. More than half of the clients (57.6%) reported drinking from two to ten days over the past thirty-day period, with an average of five days in which alcohol was consumed. On those days in which the client indicated that she drank alcoholic beverages, the range was from two to twelve drinks per day, with an average consumption of seven alcoholic drinks during each of the days of drinking over the previous thirty-day period. When asked about the number of days over the past 90 days in which the client had consumed four or more drinks at one time, the mean response was nine days. Thus, over the ninety days prior to the initial intake, the average woman reported drinking four or more alcoholic drinks on at least nine different days.

Among the women who participated in the program, none reported abstinence from alcohol at the intake screening interview, but by the end-of-program assessment 81.5% reported 30-day abstinence from alcohol. More than a third (37.9%) of the women who completed the 6-month testing reported being abstinent from alcohol during the 30-day period prior to the assessment. Nearly one-half (47.4%) of the participants who completed the 12-month follow-up reported abstinence from alcohol for the previous 30 days.

Two additional measures of alcohol use were 1) improved alcohol scores across the Project CHOICES instrument and 2) decreased binge drinking. The alcohol score was derived by multiplying the frequency of alcohol use in the past 30 days by the average number of drinks consumed on a typical day in the same time period. At the end-of-program testing, 42.0% demonstrated improved alcohol scores and 79.0% reported decreased binge drinking. Likewise, at the 6-month assessment 89.7% had improved alcohol scores and 82.8% had decreased binge

drinking. Finally, at the 12-month testing 84.2 % still had improved alcohol scores and 81.6% demonstrated decreased binge drinking.

By the end-of-program exit interview, 28.8% of the women were using birth control effectively, 42.5% demonstrated improved alcohol scores, 78.8% had decreased binge drinking, and 81.3% reported abstinence from alcohol. At the 6-month follow-up assessment, 92.5% reported using birth control effectively, 88.7% demonstrated improved alcohol scores, 83.0% had decreased binge drinking, and 35.8% reported total abstinence from alcohol. At the one-year follow-up, 83.3% of the participants were using birth control effectively, 83.3% demonstrated improved alcohol scores, 83.3% had decreased binge drinking, and 47.2% reported abstinence from alcohol.

Outcome Findings

The primary dependent measure of Project CHOICES included three interview items that were assessed at each of the three testing intervals – intake, 6-month follow-up and 12-month follow-up. Therefore, the first statistical analysis was a repeated measures multivariate analysis of variance (MANOVA) conducted to examine the changes in the mean scores of the dependent measures across the three testing intervals. Statistical significance was established at $p < .05$. The repeated measures MANOVA resulted in a Wilks' Lamda value of 0.175, which is an approximate $F(6, 30)$ value of 23.540. This reflects significant ($p < .0001$) change in the participants, from intake to 6-month follow-up to 12-month follow-up, when considering the three dependent items simultaneously. Although the multivariate test controls for error probability, it does not reveal which individual mean comparisons were significant. In order to determine the significance of these differences, a series of three univariate analyses of variance (ANOVA) were conducted. (See Table 1 for means, standard deviations and F values for these comparisons.)

The results of the univariate ANOVAs indicated highly significant ($p < .0001$) differences between the mean scores across the three testing intervals. In other words, there was significant change in the participants on these three variables from intake to follow-up. However, examination of the 6-month and 12-month follow-up means raised concern about the degree of change between the two follow-up intervals. On each of the three variables, there appears to be very little, if any, change from 6-month to 12-month assessment. In fact, at 12-month there appears to be a slight increase in scores from the 6-month assessment. In order to assess these individual mean comparisons, a series of paired-sample t-tests (non-independent samples) were conducted (see Table 2).

The results of the paired-sample t-tests further support the findings of the repeated measures MANOVA and ANOVA tests of significance. There was a significant reduction in the number of days in which participants had a drink of alcohol from intake to 6-month and intake to 12-month follow up. This suggests the effectiveness of the FASD Prevention Program in reducing alcohol use and sustaining that effect for up to 12 months. That no significant change was found from 6-month to 12-month testing is not surprising. The fact that the participants did not increase the number of days in which they drank is support for the effectiveness of the program for up to one year. There was a significant reduction in the number of drinks the participants had during any day in which they were drinking. As in the previous analyses, significant change was found between the mean scores at intake and 6-month, and intake and 12-month. Again, there was no change between 6-month and 12-month follow-up further supporting the long-term effectiveness of the FASD Prevention Program. From intake to 6-month and from intake to 12-month testing, significant reduction was found in the number of days in which clients consumed four or more drinks of alcohol. The FASD Prevention Program helped participants reduce the number of days in which they consumed four or more drinks. At the 12-month interval, there was a slight but significant ($p < .05$) increase from 6-month to 12-

month follow-up in this particular variable. However, the 12-month scores were still significantly less than those at intake.

On the screening instrument and the 12-month follow-up measure, there was a question that asked participants to indicate the average number of days per week that they had drunk alcohol in the 90 days prior to the assessment. The mean score at screening was 2.89 with a standard deviation of 1.71, while the mean score at 12-months was 1.13 with a standard deviation of 1.53. The paired samples t-test found a t value of 5.180, which is highly significant ($p < .0001$). This is yet another quantitative finding that supports the effectiveness of this program.

Process Findings

At the end-of-program interview, participants were asked to complete a simple evaluation of the FASD Prevention Program ($n = 122$). The evaluation contained six feedback items. Three response choices were available for each item (a lot, a little, or not much). The overwhelming majority of participants indicated “a lot” to each of the feedback items. The results showed that 1) 94.3% of the participants learned how to avoid or abstain from alcohol, 2) 82.8% increased their use of effective contraception, 3) 100% learned the importance of consistent and ongoing use of birth control, 4) 96.7% learned what is FASD, 5) 94.3% learned how to prevent FASD, and 6) 86.1% learned how to talk to their partner about using contraception in a consistent manner.

All of the participants reported that they enjoyed participating in the FASD Prevention Program and Project CHOICES Intervention, and 100% said that they would recommend the program to others. The written comments consistently reflected the participants' high levels of satisfaction with the FASD Prevention Program.

Discussion

The FASD Prevention Project sought to reduce the incidence of FASD and the number of alcohol-exposed pregnancies in the South Texas border region by increasing abstinence from alcohol in non-pregnant women and increasing the use of effective contraception among women who drink alcohol and are sexually active. Of all the women who completed the four motivational interview sessions, 92.4% successfully completed the contraceptive visit with a health care provider.

The program staff continuously addressed the problems encountered early in the program to get women to follow through with their contraceptive visits. They worked closely with the directors and staff members of the other intra-agency programs to help the women connect with appropriate medical care providers. This action by staff resulted in a substantial increase in the number of clients who successfully completed the contraception visit.

In the early stages of the FASD Prevention Program implementation, staff encountered difficulty in locating participants for the six month and twelve month follow-up interviews. In the second year of project funding, the program administration and staff members developed and implemented more detailed client tracking procedures which included: collecting telephone contact information for the client, family members, and friends; documenting residential addresses of the client, family members, and friends; saving the contact information of other professionals associated with the client; recording email addresses of the client, family members, and friends; and gathering client preferences and engagement with social media such as text messaging, Face Book, and Twitter.

Throughout the implementation of the FASD Prevention Program, the staff and administration discovered that it was extremely challenging to work with the partners of participants who were in residential treatment because they often lived outside of the immediate area. During the last three years of the program, the staff was successful at working with partners

of ten program participants. In an effort to reach the partners, program participants were given packets of information about FASD, contraception, and HIV/STD to share and discuss with their partners.

During the four years of program implementation, a total of 675 women, ages 15-44, were prescreened for possible participation in the FASD Prevention Program. Through the use of a brief prescreening tool, created by the FASD Prevention Program staff, a much higher portion of women screened at risk and eligible for participation in Project CHOICES. The Project CHOICES full screening device, designed by Northrop Grumman, was administered to 239 women. At the community level, the FASD Prevention Program had a substantial impact. Staff and task force members initiated regular contact with local health providers and medical personnel in order to provide participants with a seamless transition from the FASD Prevention Program to the contraceptive health examination.

The counselor of the FASD Prevention Program initiated contact with all clients within the first 48 hours after the initial referral. When a client screened eligible for program participation, she was immediately linked with the FASD Prevention Program counselor who would explain the program and then schedule the motivational interviewing and contraceptive visits.

The FASD Prevention Program participants often voiced that they were excited to share information concerning contraception, FASD, and sexually transmitted infections with their peers, siblings and sexual partners. By instilling within the FASD participants a sense of advocacy, the project staff believed that prevention efforts would multiply within the community.

The processes employed by the agency and the personnel of the FASD Prevention Program most certainly ensured that the FASD Prevention Program was sensitive and responsive to the characteristics of the unique South Texas border population. Like the staff members of

many contemporary prevention programs, the administrators and counselor of the FASD Prevention Program received initial and ongoing regular trainings on sensitivity to all aspects of the comprehensive and inclusive definition of culture: race, ethnicity, language, socio-economic status (class), gender, sexual orientation, age, disability, and religion. In addition, the staff members hired for the program matched program participants in regards to ethnicity, gender, and spoken languages. Furthermore, since the target population in this geographic region is composed of over 95% Hispanics, with a very high portion being dominant or solely Spanish speakers, all program content and materials were presented in either English or Spanish, depending on the client's preference. By emphasizing formal training to ensure that staff members were knowledgeable about the key cultural values of project participants and were able to communicate with participants in their preferred language, the FASD Prevention Program was highly effective in reducing alcohol use and increasing effective use of birth control among women of Mexican descent in the South Texas border region.

The empirical success of the FASD Prevention Program, including the use of the Project CHOICES Intervention, serves as support for the goal of incorporating evidence-based FASD prevention information and contraceptive education into educational settings, recovery high schools, and community-based substance abuse treatment and intervention programs for adolescent and adult Hispanic females. It is essential that secondary and post-secondary school educators and counselors, and substance abuse professionals seriously consider integrating FASD prevention efforts into all appropriate service delivery designs and systems in order to help prevent alcohol-exposed pregnancies across the local, state and national levels.

The use of an FASD pre-screening tool requires minimal time and training to implement within educational curricula, recovery high school programs, or the behavior health services provided by nonprofit and private treatment agencies. This helps reduce the amount of staff and client time necessary for conducting full screening sessions with the complete Project CHOICES

screening instrument. Additionally, the limited number of counseling and psychoeducational sessions required by Project CHOICES (4) and the minimal time needed to provide these sessions (i.e., 60-90 minutes) can potentially result in major FASD prevention benefits for adolescent and adult females in educational and behavioral health programs, agencies, and institutions.

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Table 1

Means, Standard Deviations, and Repeated Measures ANOVA Values for Comparisons of the Intake and Follow-Up Scores on Three Assessment Points ($n = 36$)

Assessment Item	Intake M (SD)	6-Month M (SD)	12 Month M (SD)	F Value	P
Number of days drinking in past 30 days	6.25 (5.28)	1.44 (1.66)	1.58 (1.81)	24.96	0.0001
Number of drinks on a drinking day in past 30 days	8.58 (2.76)	3.36 (1.40)	3.58 (1.68)	70.70	0.0001
Number of days drinking 4 or more drinks at one time	11.19 (11.82)	2.03 (0.17)	2.56 (1.42)	20.43	0.0001

Table 2

Means, Standard Deviations, and Paired Sample *t* Values for Comparisons of Intake, 6-Month Follow-Up, and 12-Month Follow-Up Scores on Three Assessment Points

Assessment Item	Intake <i>M</i> (<i>SD</i>)	6-Month <i>M</i> (<i>SD</i>)	12-Month <i>M</i> (<i>SD</i>)	<i>t</i> Value (<i>df</i>)	<i>P</i>
Number of days drinking in past 30 days	6.05 (5.45)	2.16 (3.31)		5.021 (57)	0.0001
Number of days drinking in past 30 days	6.55 (5.62)		2.29 (4.95)	3.353 (37)	0.005
Number of days drinking in past 30 days		1.44 (1.66)	1.58 (1.81)	0.419 (35)	.68 (<i>ns</i>)
Number of drinks on a drinking day in past 30 days	8.17 (3.03)	3.72 (1.93)		9.052 (57)	.0001
Number of drinks on a drinking day in past 30 days	8.55 (2.73)		3.63 (1.75)	8.750 (37)	.0001
Number of drinks on a drinking day in past 30 days		3.36 (1.50)	3.58 (1.68)	0.751	.46 (<i>ns</i>)
Number of days drinking 4 or more drinks at one time	10.69 (11.84)	2.33 (1.38)		5.350 (57)	.0001
Number of days drinking 4 or more drinks at one time	11.55 (11.96)		2.79 (2.07)	4.455 (37)	.0001
Number of days drinking 4 or more drinks at one time		2.03 (0.17)	2.56 (1.42)	2.324 (35)	.03