Psychosocial Prenatal Intervention to Reduce Alcohol, Smoking and Stress and Improve Birth Outcome among Minority Women1

Author: Mehl-Madrona, Lewis E, MD, PhD

Publication info: Journal of Prenatal & Perinatal Psychology & Health 14. 3/4 (Spring 2000): 257-278.
ProQuest document link

Abstract: None available.

Full Text: Headnote ABSTRACT: Background: Culturally sensitive intervention programs are needed to help Native American and Hispanic populations reduce alcohol, drug and tobacco use during pregnancy. Reduction of the adverse impact of psychosocial stress, increase of social support, and adequate preparation for labor and birth is also desirable. Methods: Social marketing theory and public health strategies that included focus groups, in-depth interviews, and intercept interviews were used with Native American and Hispanic health educators and health care providers to develop a series of 7 group sessions. Two pilot groups of 150 women were conducted. Then a series of workshops were conducted for health educators with the aim of their importing the program to their home communities. A subgroup of these educators undertook further training and then collected data on the outcomes of 320 women who attended the intervention. These outcomes are compared to a matched, comparison group. Results: The initial retention rate of women starting classes was 62%. Active encouragement by health care practitioners increased retention to 94%. Women in the Intervention group had significantly fewer Cesarean deliveries, oxytocin augmentations, and use of analgesia/anesthesia. Apgar scores were better and the number of special care nursery admissions was lower. The Intervention Group showed more drinking reduction among heavy drinkers. More women quit smoking. Being in the Intervention Group was associated with a greater likelihood of normal delivery (OR = 4.40). Membership in the Intervention Group protected against cesarean delivery (OR = 0.33). Being in the Intervention Group (OR = 0.22) decreased the risk for use of analgesia or anesthesia, oxytocin use during labor (OR = 0.23), the infant's having a low Apgar at one minute (OR = 0.15) and at 5 minutes (OR = 0.18). Conclusions: A prenatal intervention program which includes endorsement and support by health care providers as well as intrapartum labor support can reduce the risks for cesarean birth and can improve infant outcome and incidence of normal delivery. The means by which this is accomplished is hypothesized to relate to reduction of substance use during pregnant, to the avoidance of analgesia and anesthesia during labor, and to nonspecific effects of women having a supportive, female companion during labor. Health education programs for pregnant women can be implemented in minority communities and can be made sufficiently attractive to women to foster attendance. Costs are within the budgets of most Indian Health Service units and are more than offset by savings during the perinatal period. INTRODUCTION Minority women who are pregnant are more likely to be of lower socioeconomic status and unmarried, circumstances which are associated with higher gestational risk [1-3]. These women may experience more psychosocial stress than their white, middle-class counterparts. Such stress is associated with an increased incidence of pregnancy complications, including low birth weight [4-8]. Minorities experience more of the stressful life events which are linked to pregnancy complications [17-21]. Stressful or anxiety provoking life events activate the pituitary-adrenocortical axis and the sympathetic-adrenomedullary system, resulting in elevated blood plasma concentrations of the glucocorticoid corticosterone (CS) and of the catecholamines norepinephrine (NE) and epinephrine (E) [22,23]. These hormones can reduce uterine blood flow and fetal oxygenation. Minorities typically have higher Life Stress scores which, by themselves, have been insufficient to differentiate increases in obstetrical complications, premature births or growth retardation [24]. Yet prediction of obstetrical complications has been obtained [25] from ratings of perceived life stress. If psychosocial support could buffer that stress, better pregnancy outcomes might result. Excess alcohol use is a major public health problem implicated in motor vehicle accidents [26], violent behavior, physical injuries, property damage [27],

acquaintance rape, and sexual aggressiveness [28]. Reducing the dangers of heavy alcohol use during pregnancy has been targeted as a national health goal [29]. The risks of smoking during pregnancy are well established [30,31]. Between 25 and 41% of women smokers stop smoking when they become pregnant, and the majority of those who do not stop reduce their consumption of cigarettes by approximately 50% [32-34]. Studies of smoking cessation advice during pregnancy show success for individual advice and counseling [35], brief advice from public health nurses and a self-help manual [36], self-help materials sent through the mail [37], advice from physicians with specially designed leaflets [38] and extended advice from public health nurses [39]. A study of just advice from physicians showed no effectiveness [40]. Three of these studies reported a significant increase in the mean birth weight of babies born to mothers in the intervention group compared with those hi the control group [35,38,39]. In a study of 608 Arizona women, 32% were cigarette smokers when they become pregnant [41]. Forty one percent of the smokers quit during pregnancy. Seventy-five percent quit because of infant health concerns; 8%, because of physician and family advice and 6%, because of illness or nausea from smoking. The 64% who continued to smoke during pregnancy reduced their consumption and another 16% reported periods of attempting to quit. Forty percent of those who quit during pregnancy returned to smoking afterwards. In one representative study from rural Missouri, nicotine was detected on analysis in 46% of pregnant women. The same percent of women reported smoking [34]. Marijuana was detected in 9.4% of patients and 8.3% of patients reported use. Fifteen percent used alcohol. Intervention programs are often designed by majority practitioners and implemented with ethnic minorities who do not necessarily relate to the methods, theories and assumptions of their health professionals [42]. Minority groups have historically had little involvement in the design of programs offered for their benefit. Both race and gender affect the judgments of intake counselors at a University Counseling Center [43]. For these reasons a need existed for an intervention to which minority populations could readily relate. The intervention to be developed was designed to change psychosocial risk factors during prenatal care. Patients are more apt to respond to therapist from their own minority group or to interventions which make sense within their own cultural context [42-47]. The purpose of this study was to design and evaluate a psychosocial prenatal intervention for reducing substance utilization and perceived life stress while increasing social support among predominantly minority populations. The program was designed to address the specific needs and culture of Native American women, as well as being useful to other minorities. The objective was to determine whether or not participation in the intervention would lead to more normal deliveries. Additional data was to be collected to determine if such a reduction could be related to (a) decreased use of analgesia/anesthesia for delivery, (b) smoking reduction, (c) alcohol reduction, or (d) other factors. METHODS Social Marketing Theory Social marketing theory (SMT) is defined as the "design, implementation, and control of programs seeking to increase the acceptability of a social idea or practice to a target group(s)" [48]. Its exchange model stresses the idea that individuals or groups are willing to trade their resources (time, for example) to gain what is being sold (what they will receive in benefits from a prenatal class, for example). The consumer orientation aspect of SMT focuses on product design based upon the needs of the consumer. Marketing tools, including market research, audience segmentation (subdividing the audience into smaller, more homogeneous groupings and designing messages appropriate to each subgroup), and product positioning (defining the way the product is viewed cognitively and emotionally) are utilized in the development and design of social programs under SMT [48]. The "4P" concept refers to price (the cost that a person will accept), place (the communication channels through which the program is advertised), promotion (the strategies used to communicate to the audience about the program), and product (what is being "sold"). These concepts of SMT were integral in the design of the Intervention for pregnant minority women. Program Design The project began with meetings of Native American and Hispanic pregnant women and prenatal health care providers. Interviews and pilot groups took place in Tucson, Arizona, and in Albuquerque, New Mexico. Four focus groups were conducted along with in-depth interviews and intercept interviews. Women were contacted and invited to attend through their health care providers (who also participated) and through local

health-related community organizations. The socioeconomic status was generally low. A total of 73 women and 46 men attended. Their mean age was 31.4 years old. The range was from age 15 years to age 49 years. The philosophy and approach of SMT was followed throughout. Focus groups were continued until consensus was reached regarding the program for the Intervention. The group was instructed that their help was needed to develop a prenatal intervention that would be (1) appropriate to Native American and Hispanic populations, (2) capable of helping women to reduce the impact of stress in their lives, (3) capable of reducing women's fear of birth, and (4) able to provide alternatives to alcohol and drug use. In depth interviews were conducted with 31 women and covered their perceptions of their needs during pregnancy and their wishes for health care response to those needs. Women were asked general demographic questions, asked about alcohol, tobacco, and drug consumption in their families and communities, asked how they thought people could best be helped to reduce such substance consumption during pregnancy, and asked what would attract them to attend such a program. The "4P" approach included questioning them about what price (time commitment, need for childcare) they would be willing to pay for a program, and what their goals would be. They were asked for specifics about their ideal program, including how it should be promoted to obtain their best response of attending. They were asked about where to promote and to advertise. Shorter intercept interviews were conducted with 99 Native American pregnant women in two health care facilities. These interviews covered the women's reaction to the program that had been designed, along with their perceptions of how best to address drug, alcohol, and tobacco consumption among their friends and neighbors who were pregnant, and how best to achieve the goal of reducing consumption of these substances. Recruitment Primary promotion was through the women's health care providers and their health care facility. Flyers were posted in laundromats, community centers, and childcare centers, the three locations most highly recommended by women themselves as places where they would notice and read a flyer. Health care providers gave names to the author for the first group of 99 women. He called them and invited them to participate. No further instructions were given by the women's health care providers. Health care providers told the second group of 51 women that they were "required" to participate. This group of women were reminded of each class by their health care provider, who also asked about what happened at each class afterwards. Within this group, a buddy system was developed for women to remind each other to attend and to help each other with transportation. Treatment Program Focus groups and individual interviews resulted in a series of seven classes which the author led (assisted by a female co-leader) until he was comfortable that the classes were well-received and of interest to minority women. Dissemination When both pilot series of classes were completed, a series of workshops were offered to teach health educators, nurses, and midwives how to teach the classes. Training was provided to the health care professionals in techniques of verbal persuasion (including indirect hypnosis). A total of 198 women health care providers and counselors attended the 3 day workshops, which were offered on 5 separate occasions. Evaluation After the first 198 health educators and health care providers attended a 3 day training workshop, eleven women elected to return for further training comprising a total of nine, 6 hour days (54 hours), scheduled over three months as extended weekend trainings. Eight of these women agreed to keep track of the outcomes of the pregnant women who would attend the Intervention when they taught the procedures in their home communities. Communities represented consisted of 5 mixed Hispanic/Native American communities (four urban, one rural), 2 primarily rural Native American communities and 1 Afro-American urban community. The eight women leaders were health educators (4), a midwife (1), or nurses (3). Classes were started for women between 16-20 weeks of pregnancy and continued at intervals of every 2-3 weeks until women were 36-40 weeks pregnant. Sources of obstetrical care were limited hi each community, all located within Arizona or New Mexico. As part of the Intervention, health educators served as the labor support person (or doula) for the women who attended the classes. Acceptance of such labor support was seen as a goal for the Intervention. Sixty-four percent of women had a doula present during labor and delivery. The health educators were recognized leaders and they, within the individual communities, controlled the Intervention after the training. Notice of the availability of the

groups were generally made available by postings and discussion with community health practitioners. The communities were all sufficiently small that generally everyone knew about the intervention and discussed it freely. The size and close-knit nature of the communities (as well as Native American philosophy and local prejudice against research) made a randomized assignment procedure impossible. Native American communities do not trust research in general and find the assumptions behind a randomized, controlled trial somewhat ludicrous. For this reason, and because a naive, same>-time comparison group could not be found (all community members would have heard something about the Intervention while it was underway), an alternative strategy was used for the development of a comparison group. Outcome data was collected for all 320 women who began the Intervention. Twenty-nine women dropped out before the Intervention was half completed. Anyone who attended more than half of the sessions was considered as having participated. The demographic data for the 27 women who attended less than half the sessions was not statistically significantly different from the 291 women who attended more than half the sessions. Comparison Group A matched, comparison group was developed from data collected during the five years prior to the Intervention by the author on women from the same communities for another study [49]. These women had been interviewed and given questionnaires for a study on predicting birth risk. They had similarly been interviewed before and after pregnancy with changes in self-report of smoking, alcohol, and drug use recorded. Their willingness to volunteer for a study for which they received minimal compensation ($25) was thought to reflect a similar openness and receptivity that women showed who joined the Intervention with only promises to obtain extra services. All women received anonymous questionnaires regarding their substance use. Response bias was thought to be similar across the two groups of women. Women in the Comparison Group were matched to women in the Intervention for age, parity, marital status, race and socioeconomic status. Cases from all communities were pooled prior to matching. Prior statistical testing of data from individual communities had not revealed any statistically significant differences. Nor had statistical testing revealed any time-related differences in outcome when the first three years were compared to the last two years (for women available for the Comparison Group). There was a borderline significant trend for more cesareans and greater use of analgesia and anesthesia as time progressed without any corresponding change in neonatal or maternal outcome. These data represented a bias against the Intervention for these two outcome measures. Similar recruitment strategies (to be described) were used for the Comparison Group and the Intervention group. Health care providers had already been interviewed in the communities. They had provided women for both studies to determine their attitudes toward obstetrical practice as well as their approach to substance use during pregnancy. Providers reported counseling women verbally to reduce alcohol and cigarette use during the first prenatal visit. They did not use written materials. They did not believe their approaches had changed during the six years of data collection. Provider options for women in these communities were small. Women in the Comparison Group were usually attended by the same practitioners who attended women in the Intervention group (with the exception that IHS physicians could change often during the data collection period). Equivalence of outcomes over time tended to support our conclusion that practices had not greatly varied. Socioeconomic status in this study was defined on the basis of health insurance (level 1 = none, level 2 = Medicaid or Indian Health Service, level 3 = private health insurance). Heavy drinkers were defined as women who averaged more than three or more units of alcohol (beers, glasses of wine, shots of liquor) per day for at least one month. Age matches were made on decade intervals (age less than 20, age 20 to 29, age 30 or higher). No women were older than 39 years old. Smoking status was denned as Yes or No at conception as was drinking status. Smoking status was further characterized as number of cigarettes smoked per day, and drinking status as number of units of alcohol consumed per day (a unit is one 12 oz. beer, one 6 oz. wine, or one oz. of hard liquor in a mixed drink). There were more than 1000 cases available for matching for the Comparison group, and most women were in their 20's, having their first baby, and married. No women were excluded from either study for any reason. THE PRENATAL INTERVENTION FORMAT Incentive Exercises Lower socioeconomic status minority women need

to be provided with an initial incentive to attend a group exercise and sometimes to justify to relatives spending time on themselves. "Getting something for free", is a compelling satisfactory explanation to relatives for why the woman should go to the group. A general distrust exists of social programs. The question is often raised, "What is in this for me?" An answer must be readily apparent. Childcare was provided, along with refreshments. Incentive exercises consisted of (a) make-overs and cosmetic demonstrations, (b) hair styling lessons, (c) cooking classes, (d) talks on problem-solving in areas desired by the women (collecting child support, money management, etc.), (e) sewing lessons, and (f) other incentives planned by the women to meet their unique needs and interests. The Incentive exercises were initially determined by the health educators to match their perceptions of interests in their communities. Once groups were functioning, the women themselves chose what they wanted to do. Native American Talking Circle The Talking Circle is originally a Sioux method of communication which bypasses many of the problems minorities have with AngloAmerican group programs. In the talking circle, the leader begins the process with a prayer. Sage is burned and passed around the group to banish evil. A decorated Talking Stick is passed clockwise around the group. The holder of the stick may speak as long as desired without interruption. When the speaker has finished, she says "Ho mitakuye oyasin," which means 'To all my relations," and passes the Stick to the person on her left. The Talking Stick continues to be passed around the circle of people until it makes one full round without anything being said. The leader then makes a prayer for the group and the circle ends. The talking circle avoids the problems of (a) knowing whose turn it is to talk, (b) letting a verbal person dominate the group, (c) fearing being disrespectful by interrupting another, (d) cultural injunctions against talking about one's self and one's own activities, and (e) cultural difficulties with direct communication. Within Native America, some Sioux ceremonies are evolving into a Pan-Indian culture subscribed to by many. The Talking Circle is already widely used by many tribes as is the Lakota Sioux sweat lodge ceremony. The Talking Circle was also used unmodified in the black community. Feedback through the health educator of that community was that it was well accepted. Specifically Targeted Interventions The specific therapeutic interventions were as follows: Session One: Addressing Fears Purpose: To introduce the idea that fears are normal and healthy. Procedure: Women were asked to write down all fears that came to mind. This exercise was followed by an explanation by the leader about why fears are useful and how awareness of fears can increase relaxation. Leaders are taught to give this speech in a hypnotic manner to emphasize compliance with instructions. Then the Talking Circle procedure was used for women to present fears until discussion ends. A "fear journal" was recommended in which a woman records her fears each day. The metaphor is one of putting fear out of the mind and into the notebook. This concept is a very typical and common Native American metaphor. Session Two: Getting Support Purpose: (1) Teach the idea of relying on others; (2) teach the skills for selecting appropriate sources of social support; and (3) provide a feeling of more social support and mastery even if none currently exists. Procedure: Using the UCSF Social Support Questionnaire, each woman listed the people to whom she could turn for specific kinds of help, along with the pros and cons of receiving help from each person. Women were paired and reviewed each other's lists. They assisted each other to name the help they needed most and the help they were most able to give. These needs were written on index cards, taped on the wall, and women were matched to help each other when possible. A guided imagery/visualization exercise facilitated each woman imagining she had all the help she needed and seeing herself developing new sources of support. Feeling comfortable, relaxed and secure is emphasized. Session 3: Stress Reduction: How We Cope With Stress Purpose: (1) Increase personal awareness of coping styles; and (2) plant ideas of alternative styles of coping. Exercise: Women completed and then reviewed the Lazarus Ways of Coping Questionnaire to learn how they coped with stress and to stimulate discussion about coping. Once participants understood the concept of coping, two women presented situations they had experienced. Others described how they would have handled the situation. Alcohol, drugs, cigarettes and over eating were discussed as methods of coping. Participants were asked to recall a time when they coped with stress using alcohol, drugs, cigarettes or food. An imagery/visualization exercise was done for women to learn

relaxation skills and meditation techniques. Participants were shown how to keep stress/coping diaries. Women were paired with a buddy to help each other reduce cigarette and alcohol consumption. Session 4: Attachment to the Unborn Child Purpose: To increase attachment to the unborn child. Exercise: Slides of fetal growth and development were shown and discussed. In a guided imagery/visualization exercise the women were helped to imagine seeing and holding their unborn child, naming it, talking- to it, asking it what it specially needed from them to be healthy and normal at delivery. Plans were made to make the changes recommended. Women visualized themselves already living/behaving differently. Session 5: Preparation for Birth I Goal: (1) Decrease anxiety about the birth process; (2) decrease analgesic and anesthetic medications used during labor; and (3) decrease incidence of complications. Exercise: Slides of labor and birth were shown and discussed. A videotape of a woman giving birth was played and discussed. Session 6: Preparation for Birth II Exercise: Visualization/guided imagery of the birth process was conducted. Audio cassette tapes were made for the women's continued listening. Indirect hypnosis was used to provide appropriate suggestions for decreasing pain perception and for coping with labor. (Indirect hypnosis is conceptualized as merely the skills of persuasive communication. The words "hypnosis" or "visualization" cannot readily be used with most minorities because of negative connotations.) Session 7: Environmental Awareness Goal: To provide women with awareness of negative effects upon them from within their environment and to give them tools to counteract these effects. Exercise: New parents spoke about their experiences of parenting and building family within the context of the poverty that almost all participants shared. A community spiritual leader spoke about spiritual resources available within the community. Discussion was made of environmental and social pressures for substance abuse and unhealthy behavior. Community options and programs were presented. Women were encouraged to continue meeting with each other using the Talking Circle format. DATA COLLECTION AND ANALYSIS Data Collection Data were collected for 320 women attending the Intervention. Twenty-nine women started the Intervention but dropped out before it was half completed. Intent to treat was used as the criteria for data analysis, so all drop outs were included in the Intervention Group. Data collected from delivery records included type of labor such as: a) normal spontaneous vaginal delivery; b) Cesarean delivery; c) Oxytocin augmentation of labor; d) use of analgesia or anesthesia and amounts used; e) other complications. Information obtained about infant outcomes (from newborn records) included: a) resuscitation; b) Apgar scores; c) need for special care nursery. Changes in participant's drinking and smoking behaviors were recorded from anonymous selfreport on forms marked only by coded subject numbers. Women were assured that no one from their home communities would have access to their subject numbers. A short questionnaire was given to women at the first meeting of the group and at the last meeting of the group to assess change. Participants were assured that these questionnaires would be analyzed anonymously (by the author) and not reviewed by the health educators or any other member of their community. The questionnaire is the same as a short health hazards questionnaire given to women in the comparison group for another study [25,49] and is available upon request. Self-report has been recognized as valid for alcohol and drug use studies [50-52]. The other outcomes are reliable in their obvious nature and their being readily recorded in women's and neonates' medical records. The professional women providing the Intervention training were not asked to verify absolute amount of drinking or smoking. The issue was rather one of reduction pre- and post-intervention. Women were defined as smokers if they consumed more than 10 cigarettes per day for the past 30 days at the time of conception. The average cigarette consumption of smokers at conception was 25.3 cigarettes per day. The range was from 10 to 60 cigarettes per day. Data Analysis Calculations had previously revealed that 300 women would be sufficient to demonstrate a 20% change in number of spontaneous vaginal deliveries with a significance of less than 0.05, and the assumption of 30% variability. Frequencies of responses from intercept interviews and in-depth interviews were coded from recordings made on audiocasettes. The responses with the largest percentages were presented again to the focus groups who helped design the Intervention until consensus was reached. Data were entered into the Systat package on a Macintosh life computer. The chi-square statistic was used for comparison

purposes where appropriate. Otherwise the Tables procedure was used to generate log-likelihood ratios, which were also subjected to significance testing with a modified chi-square procedure. The Logit procedure was used for logistic regression analysis [53] using standard methods [54]. Data collection for the Comparison Group had already been approved by the University of Arizona Human Subjects Committee and the Resources for World Health Research Review Board for the other studies in which those subjects participated. Health educators obtained approval for their work from their local community health care organizations.

Table 1
Demographic comparisons

	Intervention Group	*Drop Out Group*	*Comparison Group*
Number of subjects	320	320	29
Age in years	25 + 9	25 + 9	24 + 11
Parity	0.8 + 1.4	0.8 + 1.4	0.7 + 0.7
Socioeconomic Class	1.6 + 0.8	1.6 + 0.8	0.8 + 1.4
Race:			
Black	37	37	8
Hispanic	108	108	3*
Native American	114	114	9*
White	61	61	7
Married	197	197	24*

*Indicates statistical significance with $p < 0.05$.

RESULTS Implementation Of the 99 professional women who attended the initial pilot group, 61 finished the series of classes. Of the second pilot group, 51 women attended the classes and 48 finished. Of the 198 women who completed the weekend training, 110 women implemented the Intervention or their own modification of the Intervention in their home communities. Eighty-seven of the women were salaried by a health care authority and included the Intervention as part of their regular workweek. Five women offered the Intervention as a private enterprise, charging a fee to the participants. Thirteen women offered the Intervention at no charge but after hours, since their work would not authorize them to provide it during the day. Five women modified the Intervention to use as their regular hospital prenatal classes for which sliding scale fees were charged. Outcome data for program evaluation was collected only from educators not charging a fee for participation. Telephone follow-up of these leaders revealed that all but two were excited by the Intervention and believed that it was being effective in its goal. Leaders continued to modify the Intervention to fit their setting and personality. All but six stated that leading the Intervention had confirmed for them the validity of a biopsychosocial model for pregnancy in which changes in stress and social support had an impressive impact on physiology.

Table 2
Obstetrical Outcomes

	Intervention	*Comparison Group*	*Statistical Significance*
NSVD	255	186	$p < 0.001$
Cesarean	31	70	$p < 0.001$
Oxytocin Augmentation	38	71	$p < 0.001$
Analgesia/Anesthesia Use	123	249	$p < 0.001$
Premature deliveries	17	25	NS

Drop outs are included in the data for the Intervention Group. Both groups contain 320 subjects.

Leaders reported that the most effective recruitment strategies for obtaining pregnant participants were (1) the health care provider telling the women to go to the class, (2) placing flyers in laundromats and in spiritual

gathering places (churches, ceremonial grounds). An important element in gaining community acceptance was to invite mothers and, especially, grandmothers to attend and participate with their pregnant daughters or granddaughters. Within many of the communities, the mother or grandmother was found to be a very important influence for what women actually did after health care contacts. Gaining acceptance by the older women in the community made the job of working with the younger women easier and more effective.

Table 3
Comparisons of newborn outcomes

	Intervention	*Comparison*	*Statistical Significance*
Resuscitations	6	8	NS
Special care nursery	24	61	$p < 0.005$
Septic workups	5	25	$p < 0.001$
Apgar Scores:			
1 min: <7	69	106	$p < 0.001$
5 min: <7	30	44	NS
1 min: <4	12	37	$p < 0.001$
5 min: <4	5	19	$p < 0.01$

Table 4
Effects of Intervention on Substance Use

	Intervention Group	*Comparison Group*	*p-value for Statistical*
ETOH use at conception	165 (51.6%)	160 (50.0%)	NS
ETOH reduced	131 (79.4%)	118 (73.8%)	NS
Heavy ETOH use at conception	31 (9.7%)	33 (10.3%)	NS
Heavy ETOH reduced	31 (100%)	12 (36.4%)	$p < 0.02$
Smokers at conception	104 (32.5%)	91 (28.4%)	NS
Smokers who quit	32 (30.8%)	10 (11.0%)	$p < 0.03$
Smokers who reduced	81 (77.9%)	41 (45.1%)	$p < 0.01$

Eight health educators were willing to participate in data collection to evaluate the effectiveness of the Intervention. These women had already been collecting data for us from their communities for a separate study of birth outcome (25,49). They were all observed on videotapes made for evaluation of their leading the Intervention prior to the actual start of the classes. Observation of the videotapes demonstrated successful compliance with the methods taught to them for leading the Intervention. Minor statistically significant differences were found between the Dropout Group and the Comparison Group. Dropouts were more likely to be black and married, and less likely to be Hispanic. The Intervention Group used significantly less analgesia/anesthesia, had more normal spontaneous vaginal deliveries, fewer cesareans, and less use of oxytocin during labor (Table 2). The drop out group performed more like the comparison group. None of the women in the drop out group had doulas. Fewer infants in the Intervention Group were admitted to special care nursery. Apgar scores were also higher at 1 minute and at 5 minutes. The number of admissions for septic workups of infants to the NICU was significantly less in the Intervention Group (Table 3). A significant reduction hi drinking occurred for heavier drinkers along with a reduction in smoking (both quitting and reducing) among women in the Intervention Group (Table 4).

Table 5
Behavioral Outcomes of the Intervention
Logistic regression predictors of outcome for dependent variables

Dependent variable	*Odds Ratio (O.R.)*	*95% Confidence Interval of the O.R.*	*Chi-Square of O.R. and p-value*
NSVD Normal Delivery			
Age	1.0524	1.02–1.08	11.5; $p < .001$
Smoking at conception	0.0733	0.07–0.20	85.7; $p < .001$
Heavy Drinking at conception	0.0586	0.03–0.11	13.3; $p < .0001$
Intervention Group	4.3984	2.50–7.74	32.1; $p < .0001$
Cesarean Delivery			
Age	0.7345	0.71–0.76	11.1; $p < .001$
Smoking at conception	1.8114	1.06–3.10	6.36; $p < .001$
Heavy Drinking at conception	9.1854	2.70–32.29	19.8; $p < .001$
Intervention Group	0.32930	19–0.57	11.7; $p < .001$
Neonatal Resuscitation			
Age	1.0773	1.00–1.16	3.41; $p < .01$
Anesthesia or Analgesia Use			
Age	0.9677	0.94–1.00	10.0; $p < .001$
Heavy Drinking at conception	14.4830	7.44–28.2	13.4; $p < .0001$
Intervention Group	0.0226	0.01–0.05	18.8; $p < .0001$
Premature Delivery			
Being Married	0.5767	0.31–1.09	2.47; $p < .01$
Heavy Drinking at conception	58.3500	18.6–182.9	1.32; $p < .05$
Oxytocin Augmentation or Induction			
Intervention Group	0.2306	0.14–0.37	13.5; $p < .001$
Reduction of drinking	4.2311	2.47–7.24	39.5; $p < .0001$
Reduction of smoking	6.3671	3.66–11.1	44.8; $p < .0001$
Special Care Nursery Admissions			
Age	1.0350	1.01–1.07	7.93; $p < .001$
Intervention Group	0.1532	0.05–0.32	7.81; $p < .001$

Table 5
Continued

Dependent variable	*Odds Ratio (O.R.)*	*95% Confidence Interval of the O.R.*	*Chi-Square of O.R. and p-value*
Apgar at 1 minute less than 4			
Intervention Group	0.2306	0.14–0.37	15.9; $p < .001$
Continuing Smoking	4.5776	1.87–11.2	9.00; $p < .001$
Apgar at 1 minute less than 7			
Continuing Smoking	2.6893	1.12–5.95	5.05; $p < .001$
Apgar at 5 minutes less than 7			
Intervention Group	0.1751	0.12–0.24	5.54; $p < .001$
Use of analgesia or anesthesia	4.4220	2.14–9.15	12.9; $p < .001$

Odds ratio estimates of relative risks with 95% confidence intervals and chi-square statistics. Statistical significance is $p < 0.1$ when chi-square > 2.706; $p < 0.05$ when chi-square > 3.841; $p < 0.025$ when chi-square > 5.024; $p < 0.01$ when chi-square > 6.635 and $p < 0.005$ when chi-square > 7.879.

All of the variables were considered as potential predictors in logistic regression followed by a consideration of all possible combinations of interactions among the variables. The procedure followed was a manual stairstep procedure in which variables were entered so long as they decreased the overall "log-likelihood" ratio in a statistically significant manner. Variables were removed when the addition of other variables made the estimate of their beta coefficient no longer statistically significant. Logistic regression showed that normal, spontaneous

vaginal delivery (NSVD) was predicted by being of older age, not smoking at conception, drinking less at conception and being in the Intervention Group. Having a cesarean was associated with being of younger age, smoking at conception, drinking at conception, and not being in the Intervention Group. The use of neonatal resuscitation was marginally associated with being an older mother. Using less analgesia and anesthesia during labor and delivery was associated with being older, not drinking heavily at conception, and being in the Intervention Group. Premature birth was associated with being unmarried and drinking heavily at conception. Special care nursery admission was associated with being older (Table 5). Membership in the Intervention Group protected against the baby's having a special care nursery admission. The baby having a one minute Apgar score less than 4 or less than 7 was predicted by continued smoking. Membership in the Intervention Group protected against the baby's having a one minute Apgar score less than 4. The baby having a five minute Apgar score less than 7 was predicted by the use of analgesia/anesthesia. Membership in the Intervention Group protected against these lower 5 minute Apgar scores. The baby having a five minute Apgar score less than 4 could not be reliably predicted (Table 5). Being in the Intervention Group was associated with an odds ratio of 2.08152 for reducing smoking (95% CI range from 1.38869 to 3.12002) with a chi-square statistic of 14.506 ($p < .0001$). Being in the Intervention Group was associated with an odds ratio of 2.0892 (95% CI range from 1.0725 to 4.0698) with a chi-square statistic of 4.9371 ($p = 0.038$). Membership in the Intervention Group was associated with an odds ratio of 1.2164 for reducing drinking which was not significant. Reduction of heavy drinking was associated with an odds ratio of 2.2578 (95% CI range from 1.1410 to 4.4677) with a chi-square statistic of 5.8286 ($p = .02$) (Table 5). DISCUSSION The Intervention was successful in achieving its primary purposeto increase the number of normal, spontaneous vaginal deliveries and decrease the number of cesarean births. Social marketing theory was used successfully to guide its development within the communities it was meant to serve. The Intervention appeared to sustain women's attention and participation as evidenced by the high percentage of attendance from throughout the seven classes. The verbal reinforcement and encouragement from the women's obstetrical health care providers improved retention and attendance. The Intervention is thought to have achieved success through its provision alternatives to prevent or limit women from smoking or drinking during pregnancy. Working together to support each other in achieving healthier means of coping with stress was emphasized. Pejorative interpretations were avoided. The leaders continually emphasized that the women were doing the best they could. Rather than making participants feel criticized for resorting to drinking, smoking, or other self-destructive behavior, the health care professionals tried to add to the participant's resources and skills, so that they could do even better. Improvement in self-esteem was also a goal. The success of the program may be attributable in part to (a) the observed reduction in heavy drinking and smoking, (b) the improved ability of the women to cope with their psychosocial stress, including the friendships and support networks women developed with each other as a result of the Intervention, (c) the Hawthorne effect, (d) the use of doulas for labor support by the women in the Intervention Group, (e) specific help the women received in anticipating and preparing for labor so as to cope with the process better, and (g) decreased desire and need for analgesia and anesthesia-two factors which are known to increase birth complications. Heavy drinking and smoking were associated with increased risk for intervention at birth. While there is a toxic effect of heavy drinking and of smoking, the variables in this study very likely also include a multitude of psychosocial stresses and inadequate social supports. Using the database from which the comparison population was derived, Mehl and Manchanda [49] showed a synergistic effect on infant condition at birth of alcohol use, consumption of other substances (tobacco, marijuana, cocaine, etc) and stress. Women who drank up to two units of alcohol per day showed no significant ill effects in the absence of consumption of other substances and in the absence of stress. Addition of stress or one other substance resulted in a significant increase in risk for poor fetal condition, but only after a ten unit alcohol consumption per week level had been surpassed. This type of community-based research presents inherent limitations in the sophistication of the types of data that can be collected. Community-based research cannot be as tightly controlled as a structured

project within an academic medical center. Thus, there are inherent uncertainties in explaining why the Intervention was helpful. The advantage of this type of study is its closeness to the reality of the daily practice of medicine within indigent and minority communities. The findings demonstrate that the principles behind the Intervention can be applied in a variety of communities and produce positive results on birth outcome. These Interventions were carried out by motivated leaders known to many of the participants who lived within the communities they served. In addition to the specific Intervention, there must have been other points of contact between group leaders and participants (casual grocery store encounters, community functions, religious ceremonies) at which additional support was given. The tight-knit nature of these communities probably also explained the relatively small number of people who dropped out before half the sessions were finished. The results of this Intervention argue that psychiatrists and other mental health care providers should be involved in prenatal care, and that important preventive services can be provided within diverse ethnic communities. This program represented a more focussed version of prepared childbirth classes, which many women have already been socialized to expect to attend during pregnancy. The cost-benefit ratio was desirable. The success of the Intervention may also suggest the design of other group psychiatric interventions within community settings. Footnote 1 Data analysis and preparation of this report was supported by an NIAAA training grant to the Prevention Research Center and the University of California at Berkeley. Training for this research and data collection was supported by Resources for World Health, Inc., San Francisco, California, and by an anonymous private donor from Tucson, Arizona. Dr. Mehl-Madrona is the Clinical Program Director at the Center for Health and Healing, Beth Israel Medical Center, 245 Fifth Avenue, 2nd Floor, NY, NY 10016; Phone: 646-935-2220; email: coyotemd@earthlink.net References REFERENCES 1. Naeye R.L. (1981). Nutritional/non nutritional interactions that affect the outcome of pregnancy. The American Journal of Clinical Nutrition, 34, 727-731. 2. van den Berg B.J. (1981). Maternal variables affecting fetal growth. The American Journal of Clinical Nutrition, 34, 722-726. 3. National Center for Health Statistics. (1984). Advance report of final natality statistics, 1982. Monthly Vital Statistics Report, Supplement, 33(6). 4. McDonald R.L. (1968). The role of emotional factors in obstetric complications: A review. Psychosom. Med., 30, 222-237. 5. Chalmers B. (1982). Psychosocial aspects of pregnancy: some thoughts for the eighties. Social Science and Medicine, 16, 323-331. 6. Smilkstein G., Helsper-Lucas A., Ashworth C., Montano D., Pagel M. (1984). Prediction of pregnancy complications: An application of the biopsychosocial model. Soc Sci Med, 18, 315-321. 7. Ramsey C.N. Jr, Abell T.D., Baker L.C. (1986). The relationship between family functioning, life events, family structure and the outcome of pregnancy. J Fam Pract, 22, 521-527. 8. Reeb K., Graham A., Zyzanski S., Kitson G. (1987). Predicting low birthweight and complicated labor in urban black women: A biopsychosocial perspective. Soc. Sci Med, 25(12), 1321-1327. 9. Davids A., DeVault S. (1962). Maternal anxiety during pregnancy and childbirth abnormalities. Psychosomatic Medicine, 24, 464-470. 10. McDonald R.L., Christakos A.C. (1963). Relationship of emotional adjustment during pregnancy to obstetric complications. American Journal of Obstetrics and Gynecology, 86, 341-348. 11. McDonald R.L., Parham K.J. (1964). Relation of emotional changes during pregnancy to obstetric complications in unmarried primigravidas. American Journal of Obstetrics and Gynecology, 90 (2), 195-201. 12. Burstein I., Kinch R.A.H., Stern L. (1974). Anxiety, pregnancy, labor and the neonate. American Journal of Obstetrics and Gynecology, 118, 195-199. 13. Erickson M. (1976). The relationship between psychological variables and specific complications of pregnancy, labor and delivery. Journal of Psychosomatic Research, 20, 207-210. 14. Spielberger C.D., Jacobs J.A. (1978). Emotional reactions to the stress of pregnancy and obstetrics complications. In Clinical Psychoneuroendocrinology in Reproduction. Carenza L, Pancheri P, Zichella L, eds. Academic Press, New York, 261-269. 15. Standley K., Soule B., Copans S.A. (1979). Dimensions of prenatal anxiety and their influence on pregnancy outcome. American Journal of Obstetrics and Gynecology, 135, 22-26. 16. Crandon A. (1979). Maternal anxiety and obstetric complications. Journal of Psychosomatic Research, 23, 109-111. 17. Nuckolls K, Cassel J., Kaplan B. (1972). Psychosocial assets, life crisis and the prognosis of pregnancy. American Journal of Epidemiology, 95(5), 431-441. 18. Gorsuch R.L., Key M.K. (1974).

Abnormalities of pregnancy as a function of anxiety and life stress. Psychosomatic Medicine, 36, 352-362. 19. Newton R.W., Webster P., Binu P.S., Maskrey N., Phillips A.B. (1979). Psychological stress in pregnancy and its relation to the onset of premature labor. British Medical Journal, 2, 411-113. 20. Norbeck J.S., Tilden V.P. (1983). Life stress, social support and emotional disequilibrium in complications of pregnancy: a prospective, multivariate study. Journal of Health and Social Behavior, 24, 30-46. 21. Newton R.W., Hunt L.P. (1984). Psychosocial stress in pregnancy and its relation to low birth weight. British Medical Journal, 288, 1191-1194. 22. Axelrod, J. &Reisine, T.D. (1984). Stress Hormones: Their interaction &regulation. Science, 223, 452-459. 23. DeBoer, S.F., Koopmans, S., Slangen, J.L., VanderGugten, J. (1990). Plasma catecholamine, corticosteroid and glucose responses to repeated stress in rats. Brain Res Bull, 24, 843-847. 24. Larsson G., Spangberg L., Theorell T., Wager J. (1987). Maternal opinion of psychosocial support: evaluation of an antenatal programme. J Adv Nurs, 12(4), 4419. 25. Mehl L.E. (1990). Systems dynamics computer modeling to predict birth risk among medically low risk women. Intl. J Prenatal and Perinatal Studies, 1, 47-68. 26. U.S. Department of Transportation. (1986). The Drunk Driver and Jail Problem. Washington, D.C. US Govt Printing Office; DHHS publication no. 119857-179-941 (Vol 1). 27. Anderson D.S., Gadaletto A.F. (1986). College alcohol survey. Alcohol Res World, 10(4), 46-9. 28. Muehlenhand C.L., Linton M.A. (1987). Date rape and sexual aggression in dating situations: Incidence and risk factors. J Couns Psychol, 34, 186-96. 29. U.S. Department of Health and Human Services, Public Health Service. Healthy People 2000: National Health Promotion and Disease Prevention Objectives (full report with commentary). Boston: L Jones &Bartlett, 1992. 30. U.S. Department of Health and Human Services. The health consequences of smoking for women. A report of the Surgeon General. Washington: Department of Health and Human Services, 1983; USG No. 1983-410 889/1284. 31. Population Information Program, Johns University. (1979). Tobacco-hazards to health and human reproduction. Population Rep [L], 1, 1-37. 32. Freemason D.M., Shannon F.T. (1979). Smoking during pregnancy. Aust N Z J Med, 89, 41-3. 33. Williamson D.F., Serdula M.K., Kendrick J.S., Binkin N.J. (1989). Comparing the prevalence of smoking in pregnant and non pregnant women, 1985 to 1986. JAMA, 261, 70-4. 34. Gold A. (1992). Substance abuse in pregnancy: prevalence in rural women. Obstetrics and Gynecology, 79, 245-251. 35. Sexton M., Hebel R. (1984). A clinical trial of change in maternal smoking and its effect on birth weight. JAMA, 251, 911-5. 36. Windsor R., Cutter C., Morris J. (1985). The effectiveness of smoking cessation methods for smokers in public maternity clinics: a randomized trial. Am J Public Health, 79, 182-7. 37. Ershoff D.H., Mullen P.D., Quinn V.P. (1989). A randomized trial of a serialized self-help smoking cessation program for pregnant women in an HMO. Am J Public Health, 79, 182-7. 38. MacArthur C., Newton J.R., Knox E.G. (1989). Effect of anti-smoking health education on infant size at birth: a randomized trial. Am J Public Health, 79, 1389-92. 39. Olds D.L., Henderson C.R., Tatelbaum R., Chamberlain R. (1986). Improving the delivery of prenatal care and the outcomes of pregnancy: a randomized trial of nurse home visitation. Pediatrics, 77, 16-22. 40. Donovan J.W. (1977). Randomized controlled trial of anti-smoking advice in pregnancy. Br J Prev Soc Med, 31, 6-12. 41. O'Campos D. (1992). Smoking cessation during pregnancy. American Journal of Preventive Medicine, 8, 8-16. 42. Jahoda, G. (1980). Comments from a cross-cultural perspective. In: A.J. Chapman &D.M. Jones (Eds) Models of Man, pp. 336-339 (Lercester, British Psychological Society). 43. Abramowitz, S.I. &Murray, J. (1983). Race effects in psychotherapy, in: J. Murray &P.R. Abramson (Eds) Bias in psychotherapy (New York, Praeger). Tomlinson, S.M. &Cheatham, HE. Effects of counselor intake judgments on service to black students using a University Counseling Center. Journal of Counseling 1989, 2(2), 105-111. 44. Baskin, D., Bheestone, H. &Nelson, M. (1981a). Ethnicity and psychiatric diagnosis, Journal of Clinical Psychology, 37, 529-537. 45. Baskin, D., Bluestone, H. Nescon, M. (1981b). Mental Illness in minority women. Journal of Clinical Psychology, 37, 491-498. 46. Journal of Clinical Psychology 1982; 38: 722-731. 47. Li-Repac, D. (1980). Cultural influence on clinical perceptions: A comparison between Caucasian and Chinese-American therapists. Journal of Cross Cultural Psychology, 11, 327-342. 48. Gries J.A., Black D.R., Coster D.C. (1995) . Recruitment to a University alcohol program: evaluation of social marketing theory and stepped approach model. Preventive Medicine, 24,

348-56. 49. Mehl L.E. and Manchanda S. (1993). Use of chaos theory to study the effects of alcohol use during pregnancy. Computers in Biomedical Research. 50. Gold A. (1992). Substance abuse in pregnancy: prevalence in rural women. Obstetrics and Gynecology, 79, 245-251. 51. Kruse L., LeFevre M., Ziveig S. (1986). Changes in smoking and alcohol consumption during pregnancy. A population based study in a rural area. Obstetrics and Gynecology, 67(5). 52. Clissold T.L., Hopkins W.G., Seddon R.J. (1991). Lifestyle behaviors during pregnancy. New Zealand Medical Journal, 104(908), 111-112. 53. Systat, Inc. (1992) The System for Statistics (Incl. Logit manual). Evanston, IL: Systat, Inc. 54. Hosmer D.W., Lemeshow S. (1989). Applied Logistic Regression. New York: Wiley Interscience. AuthorAffiliation Lewis E. Mehl-Madrona, M.D., Ph.D.

Publication title: Journal of Prenatal&Perinatal Psychology&Health

Volume: 14

Issue: 3/4

Pages: 257-278

Number of pages: 22

Publication year: 2000

Publication date: Spring 2000

Year: 2000

Publisher: Association for Pre&Perinatal Psychology and Health

Place of publication: Forestville

Country of publication: United States

Journal subject: Medical Sciences--Obstetrics And Gynecology, Psychology, Birth Control

ISSN: 10978003

Source type: Scholarly Journals

Language of publication: English

Document type: General Information

ProQuest document ID: 198683194

Document URL: http://search.proquest.com/docview/198683194?accountid=36557

Copyright: Copyright Association for Pre&Perinatal Psychology and Health Spring 2000

Last updated: 2010-06-06

Database: ProQuest Public Health

Contact ProQuest

Copyright © 2012 ProQuest LLC. All rights reserved. - Terms and Conditions