



Evaluation of a Tobacco Educational Intervention for Pregnant Alaska Native Women

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Abstract

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Keywords

Alaska Natives; Pregnancy; Pregnant women – Tobacco use; Smoking cessation; Tobacco cessation; Tobacco use

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Abstract

Tobacco cessation interventions developed and evaluated for Alaska Native women do not exist. As part of routine clinical care provided at a prenatal visit, a brief tobacco educational intervention for Alaska Native pregnant women (N=100; mean \pm SD age = 25.9 \pm 6.2 years; mean 6.3 \pm 2.6 months gestation) was piloted at the Y-K Delta Regional Hospital in Bethel, Alaska. This retrospective study reports on the evaluation of this clinical program. The intervention was consistent with the clinical practice guidelines (i.e., 5 A's – ask, advise, assess, assist, arrange), with an average duration of 20.2 \pm 6.8 minutes. The self-reported tobacco abstinence rate following the intervention was 11% at the last prenatal visit and 12% at delivery. Delivering a tobacco cessation intervention at a prenatal visit is feasible, but there is a need to identify more effective interventions for Alaska Native pregnant women.

Key Words: Tobacco cessation, tobacco use, Alaska Native, pregnancy

Introduction

Reducing tobacco use during pregnancy among Alaska Native women is a national public health priority (Fiore et al., 2008). In 2000, cigarette smoking during pregnancy was most prevalent among American Indian and Alaska Native women (20%) followed by non-Hispanic Whites (16%), non-Hispanic Blacks (9%) and Hispanic women (4%) (Martin, Hamilton, Ventura, Menacker, & Park, 2002). Overall the percentage of U.S. women reporting smokeless tobacco (ST) use during pregnancy is very low (<1%) (Substance Abuse and Mental Health Services Administration, 2006). Among Alaska Native women residing in the Yukon-Kuskokwim (Y-K) Delta of Western Alaska, between 76-79% use ST or smoke cigarettes during pregnancy (Hurt et al., 2005; Patten et al., 2008 in press; Renner et al., 2004). However, tobacco cessation interventions developed for Alaska Native women do not exist (Melvin & Gaffney, 2004; USDHHS, 2001) Moreover, aside from our qualitative work (Renner et al., 2004), health beliefs related to tobacco use during pregnancy have not been assessed among Alaska Native women.

The most common form of ST used in Western Alaska is known as *lqmik*, a mixture of fire-cured tobacco leaves and fungus ash. *lqmik* is most commonly prepared by women, who mix the ash with tobacco leaves and then pre-chew it, or mix it in a bowl with water where it is cut and stirred with a knife. *lqmik* and other tobacco products are not used ceremonially by Alaska Native people (Blanchette, 2001). Because of the high pH (10.9) of the fungus ash, almost 100% of the nicotine in *lqmik* is in the freebase form (Renner, Enoch et al., 2005). This allows for rapid absorption of nicotine across the buccal mucosal membrane, which likely contributes to the addictive properties of *lqmik*. Among 60 pregnant Alaska Native women of this region, we found that those reporting only *lqmik* use during the seven days prior to delivery had significantly higher mean concentrations of cotinine in maternal blood and infant cord blood compared with women who used other tobacco products or reported abstinence from tobacco (Hurt et al., 2005). Our findings also indicated that neonates born to mothers using only *lqmik* experienced greater adverse neurobehavioral effects (e.g., irritability) than the neonates born to women who reported using other tobacco products or no tobacco use. Nonetheless, our prior qualitative work suggests a lack of knowledge about the potential health effects of *lqmik* use during pregnancy (Renner et al., 2004).

In samples of non-Alaska Native pregnant women who smoke cigarettes, most are aware that smoking during pregnancy could be deleterious to the outcome of their pregnancy (USDHHS, 2001), that is, between 68-75% report

that smoking could have adverse pregnancy outcomes and 61-93% perceive that smoking is harmful to the fetus (Arnold et al., 2001; Dunn, Pirie, & Lando, 1998; Gawley & Cupples, 2002; Lelong, Kaminski, Chwalow, Bean, & Subtil, 1995; Walsh, Redman, Brinsmead, & Fryer, 1997). Unfortunately, these health beliefs are not highly correlated with smoking cessation during pregnancy (Acharya, Jauniaux, Sathia, Griffin, & Morgan, 2002; Arnold et al., 2001; Haslam, Draper, & Goyder, 1997). That is, most research indicates that the beliefs of women who quit are similar to those who continue to smoke. However, some studies suggest that continuing smokers are less likely to perceive adverse health effects of smoking during pregnancy than women who stop smoking (Haslam & Draper, 2000).

The state-of-the-art intervention for pregnant women (Windsor et al., 2000) consists of a brief (5-minute) cessation counseling session delivered by a trained provider and the provision of pregnancy specific, self-help materials. There are five components (5A's) of the recommended method: ask, advise, assess, assist, and arrange (Fiore et al., 2008; Melvin et al., 2000). A meta-analysis performed of 34 intervention trials during pregnancy found the mean rate of smoking cessation was 16% for intervention groups versus 9% for control groups (Lumley, Oliver, Chamberlain, & Oakley, 2004).

Building on our successful partnership and previous work with the Alaska Native community (Enoch & Patten, 2004; Renner, Enoch et al., 2005), this retrospective study represents an initial step in developing targeted tobacco cessation interventions for pregnant Alaska Native women. As part of routine clinical care provided at the first prenatal visit, the Nicotine Control and Research Program at the Y-K Delta Regional Hospital in Bethel, Alaska, piloted a brief tobacco educational intervention for pregnant women. This retrospective study reports on the evaluation of this clinical program. Our aims were to: (1) describe the baseline (i.e., prior to the intervention) socio-demographics, tobacco use characteristics, and tobacco-related health beliefs; (2) compare these baseline variables by type of tobacco used; and (3) examine maternal tobacco use status following the educational intervention at the last prenatal visit and at delivery.

Methods

This study was approved by the Yukon-Kuskokwim Health Corporation (YKHC) Human Studies Committee and Board of Directors, Alaska Native Tribal Health Consortium Board of Directors, Alaska Native Area Health Service IRB, and the Mayo Clinic IRB.

Study Design

A retrospective review of a clinical database and medical records was performed. Counselors were trained on the delivery of the intervention and data collection procedures. The intervention was piloted with 100 women seen for prenatal care over a 10-month period in 2002. All intervention data were entered by counselors into an electronic database. Obstetrical staff routinely assesses tobacco use at the week 36 visit and at delivery and these data are entered into the patient's medical record.

Study Setting

The Y-K Delta covers an area in Western Alaska about the size of the state of Ohio. The village of Bethel (population 6,000) is the regional hub for the villages comprising Western Alaska. Approximately 94% of the regional population outside of Bethel is made up of Alaska Native people-- predominantly Yup'ik or Cup'ik. The Y-K Delta population of 25,000 is extremely young (current median age is 23.5 years), and with low socioeconomic status (Alaska Humanities Forum, 2003). Most of the residents live largely subsistence lifestyles, hunting and fishing and gathering berries and plants, and receive some monetary assistance from the federal and state governments. The 58 villages comprising the Y-K Delta are not linked by road and are accessible only by boat, airplane, or snowmobile. The majority of residents of this region receive their health care from the village based community health aides and the Y-K Delta Regional Hospital located in Bethel, AK. Multi-specialty tertiary care is available on referral to the Alaska Native Medical Center in Anchorage. The Y-K Delta Regional Hospital is operated by the YKHC, a tribally owned and operated health corporation with a Board of elected members representing the communities within the region.

The Obstetrical Unit at the Bethel hospital is staffed by family physicians and RNs who manage triage, labor and delivery, postpartum, and the nursery. There was an average of 620 births per year from 2000-2003 to Y-K Delta women. Nearly all (96%) of Y-K Delta women are seen for prenatal care at the Y-K Delta Regional Hospital, including a prenatal visit at ~36 weeks gestation (Patten et al., 2008 in press). At this visit, the high-risk pregnancies (about 200 each year) are transferred to the Alaska Native Medical Center in Anchorage. The remaining women reside at the Bethel pre-maternal home until delivery and continue to have prenatal checks until delivery. Prenatal providers routinely asked about tobacco use, but a system is not in place for referring or treating pregnant women who used tobacco.

The tobacco educational clinical intervention was piloted in 2002 at the Nicotine Control and Research Program at the Y-K Delta Regional Hospital. The Nicotine Control and Research Program provide self-help materials, face-to-face and telephone counseling, along with physician referrals for medications to quit tobacco if indicated.

Patients

The educational intervention was piloted over a 10-month period in 2002. During this time period, 100 Alaska Native pregnant women received the intervention. There were 549 women seen for their first prenatal visit during the time period March 1, 2002 through December 31, 2002. Based on our prior studies examining tobacco use prevalence (Patten et al., 2008 in press), we conservatively estimate that 50% or 274 of these women were current tobacco users. Thus, our sample of 100 represents approximately 36% of all women tobacco users seen for a prenatal visit during the study period.

Intervention

Obstetricians or other health care providers at YKHC identified all pregnant tobacco users seen for a prenatal visit. If the patient was interested and willing, she was referred to the Nicotine Control and Research Program for the intervention. We did not collect data on the number of women approached. Anecdotal information provided by health care providers suggests the most common reasons for non-participation were lack of time or interest.

Four trained, female, Alaska Native, bilingual (English and Yupik) nicotine dependence counselors in the Nicotine Control and Research Program delivered the tobacco educational intervention. As part of the clinical assessment, the counselor conducted a face-to-face interview assessing socio-demographics, tobacco use, and tobacco-related health beliefs. The counselor provided advice to stop tobacco use; provided education and written materials on the effects of tobacco on the woman and her baby; assessed the woman's readiness to stop tobacco use; and assisted with quitting, if desired. A culturally and pregnancy specific brochure "How Does Tobacco Affect My Baby?" and a clinical teaching sheet "Tobacco and Pregnancy," designed by the program staff, were provided to women as part of the intervention. If the woman indicated she used Iqmik, she was given an additional brochure entitled "The Dangers of Iqmik Use." Furthermore, if the woman was ready to quit tobacco, she was given the brochure entitled "Now I'm Ready to Quit Nicotine" which described how to quit during pregnancy.

This intervention is consistent with an evidenced based intervention recommended for all pregnant tobacco users; i.e., the 5A's (Melvin et al., 2000; Fiore et al., 2008).

Procedure

A retrospective review of the clinical database was performed. The Nicotine Control and Research Program maintain an electronic data base of all clinical assessments, which was utilized for purposes of this study. Variables abstracted were socio-demographics, tobacco use characteristics and health beliefs which are detailed below (see Measures). In addition, data were abstracted from the woman's medical record to obtain her tobacco use status at the last prenatal visit and at delivery.

Measures

Prior to the intervention, the counselor assessed baseline socio-demographics, tobacco use characteristics and tobacco-related health beliefs using a structured interview.

Socio-demographics.

The counselor assessed the patient's age; education; duration of this pregnancy; number of previous pregnancies; primary language; and her access to a telephone, television, and VCR/DVD in the home or elsewhere.

Tobacco use.

The counselor assessed the type(s) of tobacco used; whether or not the woman's home was smoke-free, prior quit attempts, and whether or not tobacco was used during prior pregnancies. The women were asked the item "How soon after you first wake up do you first use tobacco?" with response options: within 5 minutes, 6-30 minutes, 31-60 minutes, or over 60 minutes, from the Fagerström Tolerance Questionnaire modified for chewers (FTQ-ST) (Boyle, Jensen, Hatsukami, & Severson, 1995; Thomas et al., 2006). We used the stage of change algorithm (Prochaska & DiClemente, 1992) as a measure of readiness to quit. Patients were asked "Are you planning to stop using tobacco for good" with response options: Yes, I've already stopped (action); Yes, I plan to quit today (preparation); Yes, within the next 30 days (preparation); Yes, within the next 6 months (contemplation); or No, I'm not planning to stop for good (precontemplation).

Health beliefs.

Drawing from existing validated measures which assess smoking-related health beliefs of pregnant women (Arnold et al., 2001; Haslam & Draper, 2000), patients were asked "Do you believe that Iqmiq is safer to use during

pregnancy than commercial chew or cigarette smoking? If yes, why?" "Do you believe tobacco has been harmful to your health? If yes, how?" and "Do you have any health concerns about your tobacco use for your baby? If yes, what are these?"

Tobacco use outcomes.

Data were abstracted from the woman's medical record to obtain information on the date of the last prenatal visit, date of delivery, tobacco use status at the last prenatal visit and at delivery, and types of tobacco used at these time points. Tobacco use status was based on patient self-report to the obstetrician or other prenatal health care provider as documented in the medical record. Tobacco use was not biochemically confirmed.

Statistical Methods

Baseline socio-demographics, tobacco use characteristics, and tobacco-related health belief variables were summarized using mean and standard deviation (SD) for continuous variables and percentages for categorical variables. In addition to point estimates, 95% confidence intervals (CI) were constructed for health beliefs. Analyses were performed to assess whether the baseline variables differed according to the type of tobacco used at the time of the intervention, employing Fisher's exact test for categorical variables and the Kruskal-Wallis test for continuous variables. Missing values were not included in denominators for percentages or statistical tests. For these analyses, type of tobacco used at the time of the intervention was categorized as Iqmiq only, commercial ST use only, cigarette smoking only, or use of multiple products. The percentage of women abstinent from all tobacco at the last prenatal visit, and at delivery, was summarized using a point estimate and 95% CI overall and by type of tobacco used at the time of the intervention. In all cases, two-sided tests were used with p-values <0.05 used to denote statistical significance.

The content of the open-ended responses regarding health beliefs (see Measures) were coded into categories, and subjected to thematic analysis by the first author. For purposes of triangulation (Lincoln & Guba, 1985), the data were independently coded and summarized for the major themes by another investigator. Discrepancies in coding were discussed until consensus was reached for the major themes.

Results

Baseline Socio-Demographic and Tobacco Use Characteristics

The 100 pregnant women were from 32 different villages on the Y-K Delta. Table 1 shows the baseline socio-demographics, tobacco use characteristics, and tobacco-related health beliefs, overall and by type of tobacco used at the time of the intervention. The women were on average 25.9 ± 6.2 years of age (median 25, range 16-42) and were at 6.3 ± 2.6 months gestation (median 7.9, range 0.7 to 8.9) when seen for the educational intervention. Nearly all (98%) of the women reported they had a television and VCR/DVD player in their home, and 98% had a telephone in their home or had access to one. All currently used tobacco: 56 used Iqmik only, 18 smoked cigarettes only, 13 used commercial ST use only, and 13 reported multiple products. For patients using multiple products, 6 used Iqmik and commercial ST, 3 used Iqmik and smoked cigarettes, 3 used commercial ST and smoked cigarettes, and 1 used all 3 products. None reported current pipe or cigar use. The proportion of patients who used Iqmik only was higher for those who reported Yupik as their primary language (86%) compared with those reporting English (14%) or Cupik (0%) as their first language ($p < 0.001$). No other socio-demographic characteristics differed significantly by type of tobacco used at the time of the intervention.

Table 1. Baseline Socio-demographics, Tobacco Use Characteristics, and Tobacco-Related Health Beliefs by Type of Tobacco Used at the Time of the Tobacco Educational Intervention among Alaska Native Pregnant Women (N=100)

Variable	Type of Tobacco Used at Time of Educational Intervention ^a					p-value ^b
	Overall (n=100)	Cigarettes only (n=18)	Commercial smokeless tobacco only (n=13)	Iqmik only (n=56)	Multiple Products (n=13)	
Socio-demographics						
Age, mean \pm SD	25.9 ± 6.2	25.4 ± 6.2	24.3 ± 4.2	26.7 ± 6.6	25.2 ± 5.9	0.79
median (range)	25 (16-42)	24 (16-42)	25 (19-31)	25 (17-42)	26 (17-36)	
Gestation at intervention,						
mean \pm SD days	192.5 ± 78	198.9 ± 77.5	208.2 ± 71.9	185.2 ± 81.2	202.5 ± 74.6	0.74
median (range)	240 (22-269)	244 (33-266)	232 (64-269)	235 (22-268)	245 (67-265)	
Education,						
mean \pm SD years	10.2 ± 4.0	10.4 ± 4	10.8 ± 3.3	10.2 ± 4	9.6 ± 4.4	0.71
median (range)	12 (0-15)	12 (0-13)	12 (0-12)	12 (0-15)	11 (0-14)	
Primary language						
Yup'ik	64 (64)	2 (11.1)	8 (61.5)	48 (85.7)	6 (46.2)	<.0001
English	34 (34)	16 (88.9)	4 (30.8)	8 (14.3)	6 (46.2)	
Cupik	2 (2)	0 (0)	1 (7.7)	0 (0)	1 (7.7)	

Variable	Overall (n=100)	Cigarettes only (n=18)	Commercial smokeless tobacco only (n=13)	Iqmik only (n=56)	Multiple Products (n=13)	p-value ^b
Telephone in home	94 (94)	16 (88.9)	11 (84.6)	54 (96.4)	13 (100)	0.17
If no, access to telephone	4 (66.7)	1 (50)	2 (100)	1 (50)	--	--
Television and VCR/DVD in home	98 (98)	17 (94.4)	13 (100)	55 (98.2)	13 (100)	0.69
If no, access to television & VCR/DVD	0 (0)	0 (0)	--	0 (0)	--	--
Reported at least one previous pregnancy	72 (72)	14 (77.8)	6 (46.2)	43 (76.8)	9 (69.2)	0.18
Number of prior pregnancies (n=72)						
mean ± SD	3.1 ± 3.0	2.6 ± 1.9	2.2 ± 3.0	3.4 ± 3.2	3.7 ± 3.4	0.50
median (range)	3 (0-14)	3 (0-6)	0 (0-9)	3 (0-14)	4 (0-11)	
Tobacco Use Characteristics						
Smoke-free home	89 (89.0)	16 (88.9)	10 (76.9)	51 (91.1)	12 (92.3)	0.556
Readiness to quit tobacco						
Precontemplation	54 (56.3)	11 (61.1)	4 (36.4)	33 (61.1)	6 (46.2)	0.24
Contemplation	9 (9.4)	0 (0)	2 (18.2)	6 (11.1)	1 (7.7)	
Preparation	30 (31.3)	6 (33.4)	4 (36.4)	15 (27.8)	5 (38.5)	
Action	3 (3.1)	1 (5.6)	1 (9.1)	0 (0)	1 (7.7)	
Tobacco use upon awakening						
Within 5 minutes	12 (12.5)	2 (11.1)	1 (8.3)	5 (9.3)	4 (33.3)	0.57
6-30 minutes	20 (20.8)	5 (27.8)	4 (33.3)	10 (18.5)	1 (8.3)	
31-60 minutes	18 (18.8)	4 (22.2)	1 (8.3)	11 (20.4)	2 (16.7)	
Over 60 minutes	46 (47.9)	7 (38.9)	6 (50)	28 (51.9)	5 (41.7)	
Prior attempts to stop tobacco use						
0	38 (38.4)	6 (33.3)	6 (50)	23 (41.1)	3 (23.1)	0.79
1	21 (21.2)	4 (22.2)	1 (8.3)	12 (21.4)	4 (30.8)	
2 or more	40 (40.4)	8 (44.4)	5 (41.7)	21 (37.5)	6 (46.2)	
Used tobacco during one or more previous pregnancies (n=72) ^c	65 (90.3)	10 (71.4)	3 (50)	43 (100)	9 (100)	<.0001
Number of previous pregnancies in which tobacco was used (n=65)						
mean ± SD	4.0 ± 2.8	3.1 ± 1.7	5.7 ± 2.9	4.0 ± 3.1	4.4 ± 2.2	0.36
median (range)	3 (1-14)	3 (1-6)	4 (4-9)	3 (1-14)	5 (1-8)	
Tobacco-Related Health Beliefs^d						
Believes Iqmik is safer to use during pregnancy	11 (11.1)	2 (11.1)	0 (0)	7 (12.5)	2 (15.4)	0.67
Has health concerns about her tobacco use for her baby	40 (40.4)	8 (44.4)	6 (50)	21 (37.5)	5 (38.5)	0.87
Believes tobacco is harmful to her own health	55 (55.6)	11 (61.1)	6 (50)	29 (51.8)	9 (69.2)	0.65

a All values are n (%) except where noted. b P-values obtained using Fisher's exact test for categorical variables and Kruskal-Wallis test for continuous variables. Missing values not included in percentages or statistical tests. c N is based on number of women reporting a previous pregnancy. d N=99, data on health beliefs were missing for 1 woman.

About half of the sample (56%) reported they were in the precontemplation stage of change to stop tobacco use. There was no statistically significant association detected between patient age and readiness to quit tobacco (Spearman's rank correlation, $r = -0.04$, $p = 0.68$).

Most (72%) of the women reported at least one previous pregnancy, with an average of 3 prior pregnancies. Of the 72 women who reported at least one previous pregnancy, 65 (90%) reported they had used tobacco during at least one prior pregnancy. There was a significant difference ($p < 0.001$) in the proportion of women reporting they used tobacco during a previous pregnancy by type of tobacco used at the time of the intervention (100% among women who used Iqmiq only or multiple tobacco products, 71% among those who smoked cigarettes only and 50% among those who used commercial ST only). No other tobacco use characteristics differed significantly by type of tobacco used at the time of the intervention.

Baseline Tobacco-Related Health Beliefs

Only 11% (95% CI 6%-19%) of the women believed Iqmiq was safer to use during pregnancy than other forms of tobacco (see Table 1). Forty percent (95% CI 31%-51%) reported they had health concerns about their tobacco use for their baby, and 56% (95% CI 45%-66%) believed that tobacco had been harmful to their own health. The proportion of women who believed tobacco was harmful to their own health was significantly higher than the percentage who believed tobacco use was harmful for their baby (56% vs. 40%, $p = 0.002$). Thirty-four percent (34/99) of the women indicated no harmful effects for either self or baby, 25% (25/99) believed tobacco was harmful to self but not baby, 10% (10/99) reported tobacco was not harmful to self but harmful for baby, and 30% (30/99) indicated harmful effects for both self and baby. Tobacco-related health beliefs did not significantly differ by type of tobacco used at the time of the intervention (Table 1). Table 2 shows results of the qualitative analysis of concerns women reported about using tobacco for their own health or for their baby.

Table 2. Themes and Illustrative Quotes of Tobacco-Related Health Beliefs During Pregnancy

Harmful effects of tobacco use during pregnancy for baby

1. Baby will be born addicted to tobacco
 - born addicted
 - baby born with withdrawals, jerkiness
 - may make baby's heart beat faster, born with withdrawals
 - the nicotine going to the baby

2. Baby will not be healthy
 - might be born sickly
 - gives baby bad health
 - might not grow, low birth weight
 - baby might get sick all the time
3. Baby will have lung problems
 - less oxygen
 - asthma
 - my baby's lungs
 - chronic lung disease

Harmful effects of tobacco use during pregnancy for woman's own health

1. High blood pressure
2. Lung or respiratory problems
 - started coughing from cigarettes
 - lungs
 - breathing, get out of breath
 - bronchitis
3. Fatigue
 - get tired too easily
 - don't play sports as good as I used to, get tired easily
4. Risk of cancer
 - mouth cancer
 - can cause cancer and high blood pressure
5. General health
 - makes me sick
 - dizzy spells
 - doctors tell pregnant women not to chew because it harms baby and mother
6. Appearance related
 - yes, my teeth (brown stains)
 - yellow teeth
 - ruins my teeth
 - bad breath
 - making skin wrinkle

Tobacco Educational Intervention

The average time counselors spent delivering the intervention was 20.2 ± 6.8 minutes (median 20, range 5-45). There was no significant difference in duration of the intervention by type of tobacco used at the time of the intervention ($p=0.25$).

Follow-Up: Tobacco Use at the Last Prenatal Visit and at Delivery

The time from the date the woman was seen for the educational intervention to the last prenatal visit averaged 72.6 days (median 29.5, range 0 to 239) and from the last prenatal visit to the time of delivery was

9.3 days (median 5, range 0 to 152). The mean duration from the date of the educational intervention to delivery was 77 days (median 30, range 0 to 244). These time intervals did not differ significantly by type of tobacco used at the time of the educational intervention.

Table 3 shows the tobacco use status at the last prenatal visit and at delivery for the 100 women overall and by type of tobacco used at the time of the educational intervention. At the last prenatal visit, 11% (95% CI 6%-19%) reported they did not use any tobacco product. At delivery, 12% (95% CI 6%-20%) reported abstinence from tobacco. From inspection of Table 3, there were not substantial changes in type of tobacco used over time. For example, among the 56 reporting Iqmik only at the time of the educational intervention, 88% and 87% used Iqmik only at the last prenatal visit and at delivery, respectively.

Table 3. Tobacco Use at the Last Prenatal Visit and at Delivery by Type of Tobacco Used at the Time of the Tobacco Educational Intervention among Alaska Native Pregnant Women (N=100)

Variable	Type of Tobacco Used at Time of Educational Intervention ^a					p-value ^b
	Overall (n=100)	Cigarettes only (n=18)	Commercial smokeless tobacco only (n=13)	Iqmik only (n=56)	Multiple Products (n=13)	
Used tobacco at last prenatal						
visit	89 (89)	14 (77.8)	12 (92.3)	51 (91.1)	12 (92.3)	0.44
Type of tobacco use at last prenatal visit						<.0001
None	11 (11)	4 (22.2)	1 (7.7)	5 (8.9)	1 (7.7)	
Cigarettes	14 (14)	13 (72.2)	0 (0)	0 (0)	1 (7.7)	
Commercial chew	14 (14)	0 (0)	8 (61.5)	2 (3.6)	4 (30.8)	
Iqmik	61 (61)	1 (5.6)	4 (30.8)	49 (87.5)	7 (53.8)	
Multiple products	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Used tobacco						
at delivery	88 (88)	14 (77.8)	11 (84.6)	51 (91.1)	12 (92.3)	0.42
Type of tobacco use at delivery (n=98)						<.0001
None	12 (12.2)	4 (22.2)	2 (15.4)	5 (9.1)	1 (8.3)	
Cigarettes	14 (14.3)	13 (72.2)	0 (0)	0 (0)	1 (8.3)	
Commercial chew	14 (14.3)	0 (0)	9 (69.2)	2 (3.6)	3 (25.0)	
Iqmik	58 (59.2)	1 (5.6)	2 (15.4)	48 (87.3)	7 (58.3)	
Multiple products	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	

a All values are n (%) except where noted. b P-values derived from Fisher's exact test. Missing values are not included in denominators for percentages or statistical tests.

Discussion

This program evaluation was one step toward developing a tobacco cessation referral system and intervention that can be routinely implemented during prenatal care for Alaska Native pregnant women residing in Western Alaska. Our evaluation of this pilot clinical program addresses a priority among the Alaska Native people, specifically the health and welfare of the children (Renner et al., 2004). Together with YKHC and ANTHC, we committed to a long-term plan to address tobacco use among pregnant women and children (Enoch & Patten, 2004; Renner et al., 2004). Permanent implementation of the methods piloted in our educational intervention will require substantial system and policy changes involving extensive planning (Windsor, Dalmat, Orleans, & Gritz, 1990; Windsor et al., 2000).

The mean duration of time spent by the counselor with each woman in our educational intervention was 20 minutes. This supports the feasibility of delivering a face-to-face tobacco educational intervention at a prenatal visit. However, even briefer (i.e., 5-10 minutes) interventions at the first prenatal visit incorporating the 5 A's have been shown to enhance tobacco abstinence, and are considered state-of-the art for pregnant women (Fiore et al., 2008; Melvin et al., 2000; Windsor et al., 2000). Less time-intensive interventions (for both patients and practitioners) may also allow more women to participate. Nonetheless, the optimal duration of time needed for effective intervention needs further study.

The abstinence rates at the last prenatal visit (11%) and at delivery (12%) were minimal, suggesting the need to augment the tobacco educational intervention to increase this rate. We did not include a control group and therefore are not able to characterize the spontaneous rate of cessation in this population. Among non-Alaska Native pregnant women who report cigarette smoking at the first prenatal visit, the spontaneous rate of cessation (i.e., without treatment) assessed at the end of pregnancy is estimated to be 0%-17% (Mullen, 1999; Windsor et al., 1998). Thus, there is a need to identify more effective interventions for Alaska Native pregnant women. For example, the intervention could be supplemented with a video or telephone counseling as we learned that nearly all women had access to a television and DVD/VCR, and telephone.

Our study also reports new findings on the health beliefs related to tobacco use during pregnancy that have not been previously reported for Alaska Native women. Compared with previous studies of non-Alaska Native pregnant women who smoked cigarettes (Arnold et al., 2001; Dunn

et al., 1998; Gawley & Cupples, 2002; Lelong et al., 1995; Walsh et al., 1997), we found a much lower proportion of women who believed that tobacco was harmful to the fetus (range 61-93% in prior reports vs. 40% in our study). Moreover, the percentage of women who reported health concerns about their tobacco use for their baby was significantly lower than for the proportion indicating concerns for their own health (40% vs. 56%). The health effects of smoking during pregnancy have been well publicized in the general U.S. population. Our findings suggest that similar efforts are needed to educate Alaska Native women about the health effects of tobacco use even prior to pregnancy. Table 2 offers some insights into concerns women have that could be emphasized in such educational efforts, but also highlights areas where education may be helpful, for example, concerns about tobacco use on pregnancy outcomes were not mentioned.

Unexpectedly, very few (11%) of the women reported they believed that Iqmik was safer to use during pregnancy than other forms of tobacco. Our qualitative work (Renner, Enoch et al., 2005; Renner et al., 2004), conducted during the same time period, indicated a low level of knowledge about the health risks of Iqmik use during pregnancy. However, it is likely that our current sample may not be representative of pregnant women in the region. Selection bias could have occurred if participation varied by education or knowledge regarding the health risks of tobacco use during pregnancy, or motivation to quit tobacco use. Those referred and who agreed to participate may have been more knowledgeable about health risks. Indeed, our sample represents only about a third of all pregnant tobacco users seen for a prenatal visit during the pilot intervention period. In addition, we do not have information on whether or not the prenatal health care provider told the woman about the risks of tobacco, or Iqmik specifically, prior to being referred and seen for the educational intervention. Provider education may have influenced the health beliefs at the time of interview. Related to this, the women in our sample were seen for the intervention relatively late in pregnancy and health beliefs may differ earlier in pregnancy. Thus, our findings on tobacco-related health beliefs should be interpreted within the context of our sample and the care delivery model.

Another limitation of this study is the small sample size. Moreover, because this pilot educational intervention was implemented as a clinical service, we did not obtain biochemical verification of abstinence. As such, our tobacco abstinence rates may be an overestimate. Based on biochemical confirmation, the non-disclosure rates of cigarette smoking are as high as 23% among pregnant women (Windsor et al., 2000). However, our previous pilot

study with Alaska Native pregnant women (Hurt et al., 2005) found that all women self-reporting tobacco abstinence were found to have non-detectable concentrations of serum cotinine (a metabolite of nicotine), confirming the self-report data. Another drawback is that we did not assess the various behavioral and pharmacological treatments for tobacco use that patients may have received subsequent to the educational intervention nor tobacco use status post-partum.

Recommendations for Future Research

This study suggests several directions for future research. Prior studies suggest that tobacco-related health beliefs are not highly correlated with smoking cessation. Because health beliefs were assessed late in pregnancy and all women continued to use tobacco, we do not know the impact of health beliefs on cessation in this population. More women had health concerns about tobacco use during pregnancy for their own health than for their baby. Perhaps education on the health effects of tobacco use may be effective as one component of a tobacco cessation intervention, especially if delivered earlier in pregnancy or even pre-pregnancy. Moreover, the development, implementation, and evaluation of the feasibility and efficacy of culturally relevant interventions are needed to enhance the tobacco abstinence rate. In particular, the results from a treatment efficacy study could support the basis for a system change in the delivery of a tobacco use intervention at the first prenatal visit.

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