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Perceived Risks and Reasons to Smoke Cigarettes during Pregnancy among Alaska Native Women

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Abstract

Objective—The purpose of this study was to explore perceptions of the risks of smoking and reasons Alaska Native women give for smoking during pregnancy.

Design—A total of 118 women (54 smokers, 64 non-smokers) enrolled in a biomarker study completed a baseline interview asking about their concerns regarding tobacco use while pregnant and reasons why pregnant women might smoke during pregnancy. Responses were collapsed into six categories of perceived risks of smoking and eight categories of reasons to smoke during pregnancy.

Results—The majority of both pregnant non-smokers and smokers (72.6% and 60.4%) agreed that smoking during pregnancy could negatively impact the health of their baby. However, non-smokers were more likely than smokers (77.4% vs. 58.5%) to view smoking during pregnancy as a risk factor for the baby's development ($p=0.029$). Both non-smokers and smokers identified addiction as a reason for smoking during pregnancy (82.8% and 63%); however, non-smokers were more likely than smokers to state this was a reason for use ($p=0.015$). Seventy-three percent of the entire sample reported a reason to smoke in pregnancy was to help manage negative affect.

Conclusion—Results from this work may be helpful in advancing research by identifying targets for intervention specific to AN women receiving prenatal care in Anchorage, Alaska.

Keywords

Alaska Native; pregnancy; cigarette smoke; perceptions

Introduction

Understanding factors that maintain cigarette use during pregnancy can aid in the development of effective smoking cessation interventions for American Indian (AI) and Alaska Native (AN) people. Cancer continues to be the leading cause of death among the AN people, with the lung cancer mortality rate exceeding the United States' (U.S.) white population by 40%. The incidences of cancers (e.g., lung, colon, esophagus) among AN women is increasing and exceeds white women in the U.S. by 20% (Kelly et al. 2014). Over 90% of all lung cancers are attributed to tobacco use (U.S. Health and Human Services 2004a). Therefore, developing interventions to promote tobacco cessation among AN women is an essential step toward achieving national health objectives, and ultimately for reducing tobacco-related health disparities in this underserved population (Frieden 2013; U.S. Health and Human Services 2004b; Koh 2010).

Smoking during pregnancy has negative health consequences for both mother and baby, including pregnancy complications (e.g., ectopic pregnancy, spontaneous abortion, placenta previa); adverse pregnancy outcomes (e.g., fetal growth restriction or preterm birth); developmental difficulties for the child (e.g., sudden infant death syndrome, attention deficit hyperactivity disorder, increased risk for respiratory infections); and neonatal mortality (Agrawal et al. 2010; Cnattingius 2004; Salihu et al. 2003; Tong et al. 2009). Adult offspring of women who smoke during pregnancy are at twice the risk for developing nicotine dependence as adult offspring of women who did not smoke during pregnancy (Buka, Shenassa, and Niaura 2003; Rydell et al. 2014). The negative effects of cigarette smoking for maternal and infant health are especially relevant to AN people where prevalence of smoking during pregnancy reaches 26%–30% (Kim et al. 2010; Tong et al. 2009) compared with 9% of pregnant women in the general U.S. population (CDC National Center for Health Statistics, 2013). Further, AN women have higher rates of smoking relapse postpartum compared to non-native Alaskan women (57% vs. 41%) (Kim et al. 2010). Therefore, smoking cessation early in pregnancy and prevention of relapse postpartum would greatly improve the health outcomes of AN pregnant women and children (Fang et al. 2004; Lumley et al. 2009) and would reduce the likelihood for tobacco use among adult offspring (Rydell et al. 2014).

Assessment related to how tobacco use during pregnancy is viewed among AN women is not well understood, as it has not been previously studied. In a pilot study, rural AN pregnant women who used tobacco recognized that tobacco use was potentially harmful to their child and 56% felt tobacco was harmful to their own health (Patten et al. 2008). Further understanding of barriers to cessation and perceptions about smoking during pregnancy, from the prospective of pregnant women, will contribute to the development of novel interventions tailored to this population. Additionally, assessment of non-smoking pregnant women offers insight into the perceptions, acceptability, and beliefs related to smoking during pregnancy. This information may be useful in the creation of prevention and cessation interventions targeting various communities (Dillard et al. 2013). The purpose of this analysis was to explore perceptions of the risks and reasons for smoking during pregnancy among AN women receiving prenatal care in the south central region of Alaska.

Methods

The study was approved by the Mayo Clinic and Alaska Area institutional review boards and by the Tribal approval bodies for the Alaska Native Tribal Health Consortium and the Southcentral Foundation.

Setting and Participants

This study was conducted at a primary care center (PCC) located in Anchorage, Alaska. The PCC provides primary and prenatal care to AN people residing in the south central region of Alaska. OB/GYN specialists also located in the PCC serve AN women statewide. AN women from all Alaska regions who are identified with a higher risk pregnancy are referred to the PCC for prenatal care and delivery.

Participants were pregnant AN women receiving prenatal care in Anchorage, Alaska, who consented to participate in a study examining levels of nicotine and carcinogen exposure during pregnancy and at delivery. Women were eligible to participate if they: (1) were 18 years of age or older, (2) provided written informed consent, (3) were currently pregnant (1st, 2nd or 3rd trimester), (4) were pregnant with only one baby, and (5) planned to deliver at the participating institution located in the Alaska area. An additional inclusion criterion for current smokers was any use of cigarettes in the past seven days and, for non-smokers, no use of any form of tobacco in the last six months. Women were excluded if they had used nicotine replacement therapy (NRT) or participated in a behavioral or pharmacological tobacco cessation program within the past 30 days.

Procedures

Study recruitment occurred when women presented for prenatal care. Interested women meeting eligibility criteria reviewed study procedures and consent forms with study staff. Voluntary participation and participant confidentiality were emphasized during the informed consent process and women were advised their decision to participate had no impact upon their current or future care at the participating institution. The consent process took approximately 20 minutes.

At the time of enrollment, women were administered the assessment questionnaire by trained study staff, who read questions aloud to participants and recorded their answers on paper. The assessment was completed in approximately 25–30 minutes. Study staff reviewed each entry to ensure data accuracy. A total of eight errors (consisting of missing data and data incorrectly entered) were identified. All errors were corrected using the hard copy of the survey and all data were de-identified prior to analysis.

Measures

At the time of enrollment, participants completed an interviewer-administered assessment with study staff. Women were asked to provide their socio-demographic information, length of gestation, parity, and number of children. They were also asked about their spouse/partner smoking status, number of smokers in the household, household restrictions on smoking, and other tobacco use.

To assess perceived risk of tobacco use during pregnancy, interview questions and checklists of potential responses were developed from earlier qualitative work assessing tobacco use among pregnant AN women (Patten et al., 2008). Questions were further refined and determined for cultural appropriateness based on feedback from our Community Advisory Committee, comprised of individual providers, hospital employees, and AN community members. Women were asked by study staff ‘Do you think that there are risks of smoking during pregnancy?’ If a woman answered ‘yes,’ she was asked to specify the risk behaviors. Responses not included on the checklist also were recorded. A total of 25 unique responses were collapsed into six categories (see Table 1). The coding of responses to the six categories was done independently by the first and second authors. Discrepancies in the coding were discussed with the study team until consensus was reached. Items were coded using a content analysis approach (Hsiu-Fang & Shannon, 2005)

Reasons for tobacco use during pregnancy were assessed using a similar format. Study staff asked women ‘Do you have any worries or concerns about tobacco use?’ and ‘Why do you think that women who are pregnant might smoke?’ A checklist of responses was provided and study staff filled in ‘other’ responses. Responses were collapsed from 22 separate responses into eight categories using the same approach described above (see Table 2).

Data analysis

Participant characteristics consisting of categorical variables were summarized by frequencies and percentages while continuous variables were summarized by means and standard deviations. Differences in responses between pregnant smokers and non-smokers were made using the chi-square test (exact) for categorical variables and the two-sample t-test for continuous variables. In all cases, p -values <0.05 were considered statistically significant.

Results

Participants

A total of 118 women completed the enrollment assessment. Of these, 54 women identified themselves as smokers while 64 women reported they did not smoke. Participant characteristics are presented in Table 3. Ages ranged from 18–40 years ($M=26.5$, $SD=5.0$) with gestational age ranging 11–40 weeks ($M=31$). The majority of women (67.8%) reported living in an urbanized area with a population $>50,000$ people. Pregnant women who smoked as compared to pregnant women who did not smoke were more likely to report living with another smoker (85.2% vs. 42.2%; $p<0.001$) and to be exposed to secondhand smoke (SHS) for a longer duration of time (5.9 hours/day vs. 1.6 hours/day; $p<0.001$). Overall, women who smoked during pregnancy had more children than non-smokers (M smokers = 2.5 children, M non-smokers = 1.4 children; $p=0.022$). Only 14 women in the current study quit smoking six months prior to becoming pregnant, and none of the non-smokers reported smoking cigarettes prior to pregnancy.

Perceived risks of using tobacco during pregnancy

The majority of study participants agreed that smoking during pregnancy could negatively impact the health of the baby (see Table 1). Delivery complications and negative impact on the pregnant woman's health were generally not reported as risks of smoking during pregnancy by either smokers or non-smokers. However, women who did not smoke were more likely than women who smoked (77.4% vs. 58.5%) to view smoking during pregnancy as a risk factor for the baby's development ($p < 0.029$). Further, about 40% of smokers did not identify the potential negative consequences of smoking on the health and development of the baby.

Reasons to use tobacco during pregnancy

Non-smokers were more likely than smokers to state that addiction was a reason for use (82.8% vs 63%; $p = 0.015$). Nonsmokers tended to state that women who smoked during pregnancy were unaware of the risks; (non-smokers, 10.9% vs. smokers, 3.7%; $p = 0.14$). Seventy-three percent of pregnant smokers and non-smokers agreed women smoked in pregnancy to help manage negative affect (e.g., loneliness, sadness, stress). Most participants did not view smoking during pregnancy as being helpful with delivery, physical symptoms, or weight/appetite management. Women did not report social perceptions or a lack of concern for the baby as reasons women might continue smoking during pregnancy.

Discussion

The current study aimed to assess perception of risks of smoking during pregnancy as well as reasons to smoke during pregnancy among pregnant AN women receiving prenatal care in Anchorage, Alaska. These efforts are important because, despite decades of research evaluating treatments for smoking cessation during pregnancy and aside from our pilot study (Patten et al. 2010), no prior efforts have focused on tobacco cessation interventions for AN or AI women who are pregnant (Chamberlain et al. 2013). The majority of AN women in this study reported that smoking during pregnancy could negatively impact the health of the baby; however, non-smokers compared with smokers were more likely to view smoking during pregnancy as harmful to the baby's development. These findings suggest AN women who smoke understand the short-term consequences of smoking during pregnancy, but may be less likely than non-smokers to understand or acknowledge the long-term consequences of cigarette use during pregnancy.

Notably, only slightly more than half of the women in this study who smoked identified the negative consequences of smoking during pregnancy on the baby's health (60.4%) and development (58.5%). A majority of both non-smokers and smokers failed to identify the negative consequences smoking has on both delivery and health of the pregnant woman. Other studies with non-Native women have shown that individuals who continue to smoke are less likely to perceive the negative consequences of smoking during pregnancy as compared to women who stop smoking (Haslam and Lawrence 2004). These results demonstrate a need to educate smokers on the consequences of smoking on their baby as well as their own health. However, a general understanding of the ramifications of smoking during pregnancy may not be sufficient to prompt cessation during pregnancy in this

population. The need for objective, personalized feedback regarding the health implications of continued smoking during pregnancy was recommended by AN pregnant women participating in a pilot intervention (Patten et al. 2010). Personalized feedback may prove to be a novel strategy in reaching this population rather than interventions relying on general health information. Indeed, the aim of the parent study is to examine maternal and neonatal biomarkers of tobacco and carcinogen exposure and use this data to develop a prenatal biomarker feedback intervention to motivate smoking cessation during pregnancy.

Participants, both smokers and non-smokers, identified addiction to cigarettes and management of negative affect (e.g., sadness, stress, loneliness) as the primary reasons women smoke during pregnancy. These results are consistent with previous qualitative studies among non-Native women who reported smoking during pregnancy as a method to cope with stress and reduce symptoms of nicotine withdrawal (Edwards and Sims-Jones 1998; Flemming et al. 2013; Ingall and Cropley 2010; Thompson et al. 2004). Thus, nicotine addiction and affective states remain among the possible barriers to smoking cessation among AN women who are pregnant. Future intervention studies focused on pregnant AN women who smoke may increase effectiveness by incorporating affect management strategies in addition to behavioral and pharmacological treatments for nicotine addiction.

Pregnant smokers in this study indicated increased exposure to SHS and greater likelihood of living with a smoker compared to women who did not smoke. However, even among women who did not smoke, 40% reported exposure to SHS. Exposure to SHS during pregnancy increases the risks of prenatal complications as well as adverse fetal outcomes (Leonardi-Bee, Britton, and Venn 2011; Meeker and Benedict 2013; World Health Organization 2013; Zhou et al. 2014). Educating both smokers and non-smokers would be important for the health of the baby and mother. Additionally, predictors of women continuing to smoke during pregnancy include having a partner who smokes or living with a current smoker (Flemming et al. 2013; Schneider et al. 2010). Emphasis on including family and community members may further enhance cessation efforts tailored to pregnant AN women, as it may be more consistent with cultural values (Renner et al. 2004).

Fourteen participants reported they quit smoking 6 months prior to pregnancy and none reported quitting cigarettes immediately after becoming pregnant. Future studies comparing differences in risk perception and reasons for smoking during pregnancy among women who recently quit smoking and women who continue to smoke would offer insight into factors that may be important to consider in treatment approaches.

This study does have limitations. Results may not generalize to AN women living in more rural remote regions, as a majority of the participants reported residing in the urbanized Anchorage area. The study sample size was limited and additional subjects would have provided greater power to detect statistically significant differences. Further, this study did not include a correction for multiple comparisons that were conducted in this study, as the intent of analysis was exploratory in nature. Finally, measures employed in the current study do not have well established psychometric proprieties as this work is exploratory in nature. Future studies are encouraged to utilize established measures. Perceived community acceptance or social desirability regarding smoking during pregnancy may have influenced

participant responses such that women may have been reluctant to endorse or condone tobacco use during pregnancy. Perceptions and reasons for smoking during pregnancy were not assessed among women who recently quit in this study. Assessing differences among this subset of women may provide further insight and targets for treatment that may motivate cessation among pregnant smokers. Similarly, perceptions concerning risks related to second-hand smoke exposure were not assessed in this study. Given a majority of women smokers in this study noted living with a smoker and exposure to SHS, further understanding as to AN women's knowledge about risks related to smoke exposure may offer an opportunity for intervention.

Future studies directly assessing for this factor may provide insight in developing public health interventions for tobacco cessation among AN women. Data are exploratory and only provide a snapshot of women's beliefs at this particular time point and these women's opinions may change over time. However, the use of a cross-sectional design is appropriate given we are interested in learning more about the current beliefs in order to refine our current assessments and develop targeted interventions based on these beliefs.

The current study serves to advance our insight into perceived risks and reasons AN women give for tobacco use during pregnancy. This work will help advance intervention research into cessation options that may resonate with AN women receiving prenatal care in Anchorage, Alaska. From a clinical perspective, results from this study may aid practitioners in initiating conversations about barriers to and motivators for smoking cessation during pregnancy. From a public health perspective, health communications could be designed to increase the salience of messaging about risks of tobacco use in pregnancy (e.g., how tobacco smoke may affect a developing baby).

Elucidating factors that maintain cigarette use among AN pregnant women, from both the perspective of smokers and non-smokers, serves as an essential step in the creation of smoking prevention and cessation interventions that contribute to the reduction of tobacco-related health disparities in this underserved population. Educating all women of the potential short-term and long-term health hazards of smoking, particularly in relation to the baby's health, may help encourage tobacco cessation efforts in pregnant smokers as well as the community as a whole. Providing women with tobacco cessation support that incorporates behavioral strategies to manage both tobacco withdrawal and negative affect, could include cognitive behavioral approaches for stress and mood management. Cessation efforts among Alaska Native pregnant women are extremely important, given the high prevalence of tobacco use during pregnancy and the potential health consequences for both the mother and baby.

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Table 1Collapsed categories of reported risks of smoking during pregnancy (*n*=118)

Responses	Category	% Smokers (<i>n</i> =54)	% Non-smokers (<i>n</i> =64)	<i>p</i> -value ^a
Miscarriage Stillbirth Preterm birth Complications during delivery	Delivery complications	30.2	29.0	0.892
It will increase my risk for getting cancer one day It will be bad for my health High blood pressure	Impact health of mother	13.2	24.2	0.135
My friends will not approve My doctor won't like it	Social disapproval	1.9	1.6	0.911
It will make the baby sick It will make the baby less healthy when it is born It will increase the baby's risk for getting cancer one day SIDS Respiratory issues Increased infection risk Cardiac issues Babies will be born addicted to nicotine Passing chemicals to baby	Impact baby's health	60.4	72.6	0.166
The baby will be too small It will make the baby less smart Brain damage Birth defects Poor development	Impact baby's development	58.5	77.4	0.029
Depends on CPD use during pregnancy I don't know	Unable to respond	9.4	4.8	0.334

Note: N = number, % = percent, SIDS = sudden infant death syndrome, CPD = cigarettes per day. Number of responses per participant were not limited.

^a *p*-value is from chi-square (exact) test.

Table 2

Collapsed categories for reasons women smoke during pregnancy.

Responses	Category	% Smokers (n=54)	% Non-smokers (n=64)	p-value ^a
Addicted to tobacco Difficulty quitting Habit Craving cigarettes To avoid or limit alcohol use Replace other addiction	Addiction	63.0	82.8	0.015
Control stress Cope with negative affect	Affect management	68.5	56.3	0.172
Other women I know who are pregnant use it Social pressure to smoke/being around other smokers	Social Perception	7.4	6.3	0.803
Because it is safe to use Do not understand risks Do not care/selfish	Unaware of risks/Lack of concern	3.7	10.9	0.140
Suppress hunger Weight management	Manage appetite/weight	1.9	4.7	0.397
Speed up labor Make delivery easier Control labor pains Make the baby smaller	Help with delivery	3.7	3.1	0.863
Relieve morning sickness Feel better	Help with physical symptoms	1.9	1.6	0.903
Do not know	Unable to respond	3.7	6.3	0.531

Note: N = number, % = percent, SIDS = sudden infant death syndrome, CPD = cigarettes per day. Number of responses per participant were not limited.

^a p-value is from chi-square (exact) test.

Table 3

Participant characteristics.

	Non-smoker (<i>n</i> =64)		Smoker (<i>n</i> =54)		Total (<i>n</i> =118)	<i>p</i> -value ^a
	Mean (SD)/%		Mean (SD)/%		Mean (SD)/%	
Age	26.0 (5.1)		27.1 (5.0)		26.5 (5.0)	0.1949
Gestational week	30.7 (6.5)		31.7 (6.7)		31.1 (6.6)	0.3558
Number of children	1.4 (1.5)		2.5 (3.4)		1.9 (2.6)	0.0217
Urbanized area, <i>n</i> (% of group or % of total?)	46.0 (57.5%)		34.0 (42.5%)		80.0 (67.8%)	0.1797
Live with another smoker, <i>n</i> (%)	27.0 (42.2%)		46.0 (85.2%)		73.0 (61.9%)	<0.0001
Second hand smoke exposure in hours/day	1.6 (2.9)		5.9 (5.9)		3.5 (5.0)	<0.0001

^a *p*-value is from two-sample t-test (rank sum) or chi-square (exact) test as appropriate