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Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions

Running title: Antenatal smoking by Indigenous women

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Abstract

Introduction and aims

Smoking rates are three times as high for pregnant Indigenous women relative to non-Indigenous women, in Australia. This paper describes Indigenous women's self-reported antenatal smoking behaviour and compares knowledge and attitudes of those who: a) smoke and don't smoke during pregnancy; b) quit or continued to smoke since the beginning of pregnancy.

Design and methods

Cross-sectional surveys with 264 pregnant Indigenous women in two states collected data on smoking status, antenatal changes, risk knowledge, attitudes to smoking and socio-demographic characteristics. Multivariable logistic regression analyses assessed associations between knowledge and attitude variables and smoking status and antenatal changes in smoking status.

Results

Forty six percent of the women (n=121) reported currently smoking. The majority (68%) who smoked at the beginning of pregnancy reported quitting (21%) or reducing (47%). Relative to smokers, non-smokers had more schooling ($p=0.002$), more post-secondary education ($p=0.023$), lower parity ($p=0.003$), better understanding of smoking-related risks (miscarriage $p=0.01$; low birth weight $p=0.003$; infant illness $p<0.001$; childhood behavioural problems $p=0.007$), and less frequently expressed attitudes indicating that quitting was very difficult given other problems they faced. Similar patterns were found for women who quit during pregnancy compared to those who continued smoking.

Conclusions

Increasing awareness of antenatal smoking risks and the benefits of quitting may motivate women to attempt to quit. However, knowledge alone is unlikely to be sufficient considering the life circumstances of many Indigenous women. Addressing the social environment and daily stressors, particularly those exacerbated by pregnancy, may be critical to supporting quit attempts.

Key words: health behaviour, harm reduction, Australia, pregnancy, Indigenous

Introduction

The last few decades have seen considerable reductions in the prevalence of smoking in the general Australian population(1, 2). This benefit has not been shared by the Aboriginal and Torres Strait Islander (hereafter referred to as Indigenous) population, with the prevalence of smoking persisting above 50% for many years, although there has been a recent slight reduction(3, 4). Similarly, despite declining smoking rates among pregnant women generally, rates among pregnant Indigenous women remain three times those of non-Indigenous Australians (52% compared to 15%)(5). Factors which may contribute to these disparities include socio-economic disadvantage, marginalisation, stressful life circumstances, acceptability and normalisation of smoking within Indigenous social networks and the role of tobacco in social exchange(6-10).

The harms associated with smoking during pregnancy include risks to both mother and baby: higher rates of placental problems, low birth weight, preterm birth, intra-uterine growth retardation and perinatal death(11-13). Pregnancy is a time when many women are motivated to modify their behaviour(14). However, smoking during pregnancy among Indigenous women remains common and perinatal data indicate low quit rates(15).

There is little assistance from the published literature to guide development of effective interventions to address antenatal smoking among Indigenous women(16). Only two studies have assessed Indigenous women's knowledge and attitudes to smoking during pregnancy(9, 17). A survey of pregnant Indigenous women in North Queensland found generally good knowledge of risks, with few differences between smokers and non-smokers on knowledge or attitude items(17). By contrast, a qualitative study in Perth found women's specific knowledge of risks to be poor, and that pregnancy had little impact on attitudes to cessation, with most women preferring to reduce the number of cigarettes smoked as the benefits of smoking outweighed those of quitting(9). In

order to develop effective strategies to reduce the harms from antenatal smoking, a greater understanding of the patterns of use, and of women's attitudes and knowledge of risks is needed.

Aims

This paper:

- 1) describes pregnant Indigenous women's self-reported smoking behaviour during pregnancy;
- 2) compares the knowledge and attitudes of those who:
 - a) smoke and don't smoke during pregnancy;
 - b) quit smoking, and those who continue, among women smoking at the beginning of pregnancy.

Methods

This paper uses data from two cross-sectional surveys with pregnant Indigenous women – one from the Northern Territory (NT) and one from New South Wales (NSW). Both surveys used the same questionnaire. The project was guided by a community reference group (CRG) of Aboriginal women and service providers from rural NSW.

Recruiting participants

NT: Women attending the antenatal clinic at Royal Darwin Hospital (RDH) were invited to participate by a female Aboriginal research assistant from July to September 2010 and April to June 2011. The NT Department of Health and Family (DHF) policy recommends that women give birth in a regional hospital(18). The majority of women from remote communities in the Top End of the NT are transferred to Darwin for their baby's birth and attend RDH for antenatal care in the last part of their pregnancy(19).

NSW: At the time of the study, Aboriginal Maternal and Infant Health Strategy (AMIHS) teams provided antenatal care at 28 sites across NSW. All teams were invited to participate through their management structure and 22 agreed. Women receiving antenatal care at these sites were invited by the midwife or Aboriginal Health Worker (AHW) to participate from July to December 2009. The

number of women to be recruited by each team varied depending on the team size and their catchment population, from five to 20 women.

In both NSW and the NT, women were eligible if they were pregnant and if they or their partner were Indigenous (Aboriginal and/or Torres Strait Islander). They were excluded if they were aged less than 16 years; being treated for mental illness; or unable to provide informed consent. The staff explained the study to eligible women and provided them with information sheets. Those willing to participate completed a consent form and written questionnaire. Assistance to complete the questionnaire was offered. Staff were asked to invite all eligible women to participate and to complete a recruitment log to track participation rates.

Questionnaire development and contents

1. Literature review

Concepts included were derived from a review of published literature on smoking during pregnancy and/or among Indigenous peoples(6, 7, 9, 14, 17, 20-26). Questions regarding knowledge of risks and attitudes towards smoking during pregnancy were adapted from a questionnaire used with pregnant Indigenous women(17).

2. Consultation with professionals working in Indigenous health

The draft questionnaire was critically reviewed by several groups to assess content validity, reduce redundancy and refine the wording of questions to ensure cultural appropriateness. These groups included the CRG, the NT DHF, and colleagues experienced in Indigenous health research, tobacco control and questionnaire design. Minor revisions were made, with removal of some redundant questions and addition of others.

3. Pilot testing

The revised questionnaire was pilot-tested with 15 pregnant Indigenous women in NSW and Western Australia. Feedback from these women was discussed by the CRG with further minor changes made to the questionnaire.

The final questionnaire had a Flesch-Kincaid reading level of grade 6 and took approximately 15–20 minutes to complete. The items covered:

- Demographic and obstetric characteristics: age, ethnicity, education, if the pregnancy was planned, gestation, parity, and number of prior antenatal visits;
- Self-reported current smoking status and changes in pregnancy: smoking status - current daily smoker, occasional smoker, ex-smoker or had never smoked. Those who were current or ex-smokers were asked the amount they smoked, whether they had had a cigarette in the last seven days (even a puff), the age they started smoking, and changes to their smoking status or quantity since becoming pregnant (increased, same, decreased or quit completely);
- Knowledge of risks and attitudes to smoking during pregnancy: questions were presented as statements and participants were asked to indicate if they agreed, disagreed or weren't sure if the statement was correct;
- Assistance completing the questionnaire.

Statistical Methods

The questionnaires were computer-scannable. Data were analysed using Stata 9.2. Summary statistics of respondent characteristics were obtained. Age and years of school were categorised, and the number and percentage in each category reported. Gestation, parity and number of antenatal visits are presented as medians due to non-normal distributions. Smoking status and changes in pregnancy are reported as proportions with 95% confidence intervals (CIs).

Based on self-reported smoking status at the time of the survey, women were categorised as current smokers (daily or occasional smokers) or non-smokers (ex-smokers or never smokers). Based on reported changes during pregnancy, women smoking at the beginning of pregnancy were categorised as having 'quit' or 'continued' smoking. These categories are shown in Figure 1. The number and percentage in each of these two groups agreeing with each knowledge and attitude statement are presented.

Univariate associations with reported smoking status and changes in pregnancy were examined using the Pearson's chi-square test for categorical explanatory variables and the non-parametric Mann-Whitney test for continuous explanatory variables. Multivariable logistic regression was used to determine associations between knowledge and attitude variables and smoking status; and between knowledge and attitude variables and changes in smoking status during pregnancy, when controlling for potential confounders and adjusting for clustering by site (see Figure 1).

Demographic and obstetric variables found to be significantly associated with smoking status (p -value<0.05) were included in multivariable models as potential confounders. State was also included in the multivariable models.

We aimed to recruit 220 women from NSW and 180 from the NT. This would allow an estimate of the prevalence of current smoking with 95% confidence interval within $\pm 7\%$ of the point estimate and detection of differences in characteristics and attitudes between smokers and non-smokers of 15% or more; and between quitters and non-quitters of 20% or more, with 80% power and 5% significance level.

Ethical approval

The NT survey was approved by the Human Research Ethics Committees of the University of Newcastle and the NT Department of Human Services and Menzies School of Health Research. The

NSW survey was approved by the University of Newcastle, Hunter New England and the Aboriginal Health & Medical Research Council Human Research Ethics Committees.

Results

A total of 264 women completed questionnaires. In the NT, 137 women were invited of whom 107 (78%) agreed. In NSW 157 women completed questionnaires. Of these, 128 were from the 15 sites which returned participation records documenting the number of women approached and consenting. These sites had invited 146 women, giving a response rate from these sites of 88%. The remaining seven sites returned 29 completed questionnaires but did not return participation records; thus the consent rate is unknown for these sites. Seventy-three women (28%) had assistance completing the questionnaire.

Respondent smoking status and characteristics

Respondents' characteristics by current self-reported smoking status are shown in Table 1. One hundred and twenty-one women (46%; 95%CI: 40%, 52%) reported currently smoking daily (n=85, 32%; 95%CI: 27%, 38%) or occasionally (n=36, 14%; 95%CI: 10%, 18%). Fifty-six (21%; 95%CI: 16%, 27%) were ex-smokers and 87 (33%; 95%CI: 27%, 39%) had never smoked cigarettes. Among the 177 women who had ever smoked, 116 (66%) reported smoking in the previous seven days and the mean age of initiation was 15.2 years. Current smokers reported smoking an average of 10 cigarettes per day.

Smokers reported significantly fewer years schooling and were less likely to have any post-secondary education than non-smokers (Table 1). Smokers had higher parity and were less likely to be primiparous relative to non-smokers, with 56 (40%) non-smokers being primiparous, compared to only 29 (24%) smokers (chi-square=6.93; p=0.008).

Changes in smoking during pregnancy

The majority of women (n=99 (68%), 95%CI: 60%, 75%) who were smoking at the beginning of the current pregnancy reported either quitting completely or reducing (Table 2). There were 17 women (12%) who reported increasing the number of cigarettes smoked since becoming pregnant.

Knowledge of risks and attitudes to smoking

Smokers and non-smokers

Table 3 compares the knowledge and attitudes of women by their reported smoking status at the time of the survey. There were significant differences in knowledge of risks associated with smoking during pregnancy, with non-smokers more likely to agree that smoking increased the risk of each adverse outcome presented. There were also significant differences between smokers and non-smokers on several attitudinal items (see Table 3).

Quitters and continuing smokers

Table 4 presents a similar comparison of knowledge and attitudes by reported quitting status, among women who smoked at the beginning of pregnancy. For the variables related to knowledge of risk, there were large differences between the groups but this difference was only significant at the 5% level for miscarriage. This is likely due to the small numbers and low power for these analyses. Only 63 (53%) of the women who continued to smoke agreed that smoking increased the risk of miscarriage compared to 83% of women who quit smoking. In relation to the attitudinal items, there were a number of significant differences, all of which were also significantly different between smokers and non-smokers. Only one item which was significant in the smoker/non-smoker comparison did not differ between quitters and continuing smokers – ‘You’ve got to die of something, so why give up the things you enjoy’. However, the lack of significance was likely due to the small sample size.

Discussion

The results indicate that the majority of women reported attempting to reduce the harms associated with smoking during pregnancy by either quitting smoking completely or reducing the amount smoked. Non-smokers were more educated and of lower parity than continuing smokers. They also had better understanding of the risks associated with smoking, and were less likely to express attitudes which indicated that quitting was very difficult given the other challenges they faced including the worries associated with pregnancy (e.g. 'quitting smoking is just too hard. It's not worth the effort'; 'Most women have bigger problems to deal with than trying to quit smoking...').. Disturbingly, a small proportion of women reported increasing the amount they smoked during their pregnancy.

A North Queensland study with pregnant Indigenous women found no differences in risk knowledge between smokers and non-smokers, with differences on only one attitudinal item(27). They also found no differences in education or parity by smoking status, but had a smaller sample limiting their ability to detect differences. The reasons for the differences in findings between their study and our own are unclear, but may include that our participants were younger, less educated and were drawn from a broader population (two jurisdictions, including rural and remote communities) with different knowledge and attitudes to a north Queensland city.

Knowledge of risks associated with antenatal smoking was poorer among women who continued to smoke than among non-smokers, despite controlling for education, parity and state. A study with pregnant women in 13 Hungarian cities, found a high prevalence of smoking (51%) and a strong association between knowledge of risk and continued smoking(28). Differences in perception of risk between pregnant smokers and non-smokers have been demonstrated in a range of populations (29-31). Previous research with Indigenous people has indicated that despite wide recognition that smoking is bad for your health, knowledge of specific risks is poor(23, 32, 33), including among

pregnant women(9, 34). In our study, the majority of women smoking at the beginning of pregnancy reported taking steps to reduce the associated harm to their foetus. Providing additional information on specific risks from smoking and the benefits of quitting may help motivate more women to quit smoking altogether. A parallel study with clinicians providing antenatal care to Indigenous women, also identified gaps in knowledge of risks, particularly in relation to ongoing problems in childhood(35). Development of appropriate resources for use by antenatal providers may assist them to better explain the risks associated with antenatal smoking. Mass media messages addressing the harms of smoking during pregnancy would reinforce provider messages and raise awareness of these risks in the broader Indigenous community(8, 16).

There is a wealth of literature indicating that disadvantaged women and those experiencing stressful lives have higher rates of smoking(36-38) and are less likely to quit while pregnant(39-45). A socioeconomic gradient in smoking among Indigenous people(46), including pregnant Indigenous women(15, 47) is also recognised. Similar to our own findings, a study among low income pregnant women in the United States found that, compared to continuing smokers, those who quit were more likely to disagree with the statement “Too many other problems in life to stop smoking” and to perceive a greater risk to the foetus(29). Gilligan *et al* identified high levels of daily stress as an independent predictor of continuing smoking among Indigenous women(17). The responses to the attitudinal variables related to stress in our study suggest that women who continue to smoke are experiencing stressful situations which make quitting smoking ‘just too hard’. This is born out in other studies among Indigenous people, in which stress is cited as a contributor to smoking and a major impediment to quitting(6, 7, 10, 23, 48), including among pregnant women(9, 49). These stressors include high rates of unemployment and consequent poverty, overcrowded homes, violence, relationship difficulties, impacts of colonisation and grief and loss(6, 7, 10, 23, 48), with many of these issues exacerbated by a new pregnancy(9). These high levels of stress may account for the increases in smoking reported by some women. Addressing underlying stressors in conjunction

with smoking cessation support is likely to improve cessation outcomes. At a minimum this should include both emotional and practical support through sensitive inquiry about potential stressors, acknowledgement that these problems make quitting difficult, assistance with identified issues, and referral to other services as appropriate. Strategies shown to be successful with other low income pregnant and non-pregnant women should be evaluated with Indigenous women. These include skills training in coping strategies and problem solving(50-52) and support groups incorporating education, social support, relaxation and other stress reduction techniques(53). Approaches that address multiple psychosocial and behavioural problems in an integrated and culturally sensitive approach, tailored to an individual woman's need, and using a combination of emotional and practical support, skills training, and psychological therapies(51) may yield the greatest benefit.

A number of limitations should be considered in interpreting our findings. Firstly, we relied on self-reported smoking status. Under-reporting of smoking is likely, due to social desirability bias(54). Secondly, the smaller than anticipated sample limited our ability to detect any but large differences, particularly in comparisons between women who quit smoking and those who continued. In both jurisdictions, recruitment was stopped due to timing constraints. Thirdly, presenting respondents with a list of possible risks may overestimate their level of knowledge as women may want to appear knowledgeable and, if uncertain, err on the side of indicating agreement. Nonetheless, this approach enabled us to detect differences between smokers and non-smokers. Finally, in a cross-sectional survey any associations found cannot be considered causal. It is possible that the responses reflect a rationalisation by the respondents to explain their behaviour. Future longitudinal research would allow better understanding of the importance of the differences detected. However, an important strength of the study was the high response rate.

Conclusions

Increasing awareness of the risks of antenatal smoking, and the benefits of quitting may help motivate women to attempt to quit smoking, and increase community support for these quit attempts. Given that level of education was significantly associated with smoking status, this will need to be addressed in both non-school and school environments. However, knowledge alone is unlikely to be sufficient considering the difficult and stressful life circumstances experienced by many Indigenous women. Addressing the social environment and daily stressors they face, particularly those exacerbated by pregnancy, is critical to supporting quit attempts(8, 9, 17). In the longer term, addressing the social determinants of health, including school retention, housing and employment is required.

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Figure 1. Categorisation of smoking status and changes during pregnancy, and analytic comparisons

Table 1 Characteristics of survey respondents by current smoking status (n=264*)

	Smokers (n=121)		Non-Smokers (n=143)		Total		<i>p</i> - value**
	n	%	n	%	n	%	
Indigenous	113	(93)	123	(87)	236	(90)	0.071
State							
NSW	79	(65)	78	(55)	157	(60)	0.076
NT	42	(35)	65	(45)	107	(41)	
Age group - years							
<20	22	(18)	35	(24)	57	(22)	0.358
20-24	41	(34)	46	(32)	87	(33)	
25-29	33	(27)	28	(20)	61	(23)	
≥30	25	(21)	34	(24)	59	(22)	
Highest year at school							
<10	47	(40)	30	(22)	77	(30)	0.002
10-11	57	(48)	77	(55)	134	(52)	
12	14	(12)	32	(23)	46	(18)	
Post-secondary education	40	(33)	67	(47)	107	(41)	0.023
Planned pregnancy	28	(24)	46	(33)	74	(29)	0.107
	Median	Q1, Q3	Median	Q1, Q3	Median	Q1, Q3	
Gestation	30	(21, 37)	30	(22, 36)	30	(22, 36)	0.396

Parity	2	(1, 3)	1	(0, 2)	1	(0, 2.5)	0.003
Antenatal midwife visits	3	(2, 5)	3	(2, 6)	3	(2, 6)	0.397
Antenatal doctor visits	3	(2, 5)	4	(2, 6)	3	(2, 6)	0.218

* Numbers may not add to 264 due to missing values.

** p -value for Pearson's chi-squared test for categorical variables and the non-parametric Mann-Whitney test for continuous explanatory variables.

Table 2 Self-reported changes in smoking during the current pregnancy among women smoking at the beginning of the pregnancy (n=146)*

	n	%	95% CI
Increased	17	(12)	7%, 18%
Stayed the same	30	(21)	14%, 28%
Reduced	69	(47)	39%, 56%
Quit completely	30	(21)	14%, 28%

* 5 current smokers did not answer this question

Table 3 Smokers' and non-smokers' knowledge of risks and attitudes towards smoking tobacco during pregnancy, controlling for confounders and adjusting for clustering (n=260*)

	Smokers (n=119)		Non-smokers (n=141)			
	Agree n (%)		Agree n (%)		Adjusted OR** (95% CI)	p-value**
Knowledge of risks						
Smoking tobacco during pregnancy increases the risk of:						
Miscarriage (losing the baby)	63	(53)	104	(74)	0.4 (0.26, 0.71)	0.001
Low birth weight of baby	82	(69)	116	(83)	0.5 (0.33, 0.79)	0.003
Breathing problems and sickness in infant	79	(66)	119	(85)	0.4 (0.25, 0.58)	<0.001
Mother having high blood pressure and increased heart rate ^a	64	(54)	108	(77)	0.4 (0.24, 0.58)	<0.001
Behavioural problems in childhood	41	(35)	78	(56)	0.5 (0.26, 0.81)	0.007
Attitudes						
Its good to have a smaller baby	13	(11)	7	(5.0)	2.7 (0.62, 11.69)	0.189
I think my baby will be born healthy	97	(82)	128	(93)	0.4 (0.11, 1.24)	0.109
Light smoking does not cause harm to unborn babies	23	(20)	16	(11)	1.7 (0.80, 3.81)	0.161
Stopping smoking increases the chance of having a healthy baby	77	(65)	122	(87)	0.31 (0.17, 0.57)	<0.001

If you are around a lot of smoke from other people you might as well keep smoking yourself	41	(35)	39	(28)	1.3 (0.74, 2.40)	0.340
It's OK to drink alcohol when you're pregnant as long as you don't drink a lot	26	(17)	14	(10)	1.7 (0.96, 2.95)	0.070
Quitting smoking is just too hard. It's not worth the effort	25	(21)	6	(4.3)	5.5 (1.60, 18.82)	0.007
Cannabis ^b is OK when you're pregnant because its natural	8	(6.8)	2	(1.4)	4.8 (0.97, 23.96)	0.054
Its harder to quit smoking during pregnancy because of all the worries	60	(50)	15	(11)	7.9 (4.34, 14.45)	<0.001
You've got to die of something, so why give up the things you enjoy?	24	(20)	5	(3.6)	6.3 (3.0, 13.08)	<0.001
Women will try to give up smoking and drinking for their children even if they won't try for themselves	61	(51)	62	(44)	1.3 (0.98, 1.79)	0.065
In our community its OK to smoke when you are pregnant	29	(25)	20	(14)	2.2 (1.16, 4.20)	0.016
Most women have bigger problems to deal with than trying to quit smoking and drinking	47	(40)	21	(16)	3.2 (1.78, 5.69)	<0.001
Health care providers should tell pregnant women to quit smoking tobacco	89	(75)	107	(77)	0.8 (0.45, 1.40)	0.423
Health care providers should tell pregnant women to quit using alcohol and drugs	90	(77)	109	(78)	0.8 (0.40, 1.46)	0.404

* 2 smokers and 2 non-smokers did not answer any of the knowledge and attitude questions

** OR and *p*-value (Wald test) for agreement with each item for smokers relative to non-smokers after controlling for years at school, post-secondary education, parity and state, and adjusting for clustering

a: smoking tobacco during pregnancy is not known to be associated with increased risk of high blood pressure

b: local colloquial names (yarndi, gunja) for cannabis were used in the questionnaire

Table 4 Knowledge of risks and attitudes towards smoking tobacco during pregnancy among smokers who reported quitting during pregnancy and those who continued smoking, adjusted for confounders (n=149*)

	Quit smoking (n=30)	Continued smoking (n=119)		
	Agree n (%)	Agree n (%)	Adjusted OR** (95% CI)	p-value**
Knowledge of risks				
Smoking tobacco during pregnancy increases the risk of:				
Miscarriage (losing the baby)	25 (83)	63 (53)	3.6 (1.28, 9.87)	0.015
Low birth weight of baby	26 (87)	82 (69)	2.3 (0.76, 6.72)	0.140
Breathing problems and sickness in infant	28 (93)	79 (66)	4.7 (0.93, 23.93)	0.061
Mother having high blood pressure and increased heart rate ^a	23 (77)	64 (54)	2.4 (0.98, 5.80)	0.055
Behavioural problems in childhood	17 (57)	41 (35)	2.2 (0.94, 5.21)	0.067
Attitudes				
Its good to have a smaller baby	1 (3.5)	13 (11)	0.3 (0.04, 2.0)	0.203
I think my baby will be born healthy	27 (93)	97 (82)	3.4 (0.82, 14.08)	0.091
Light smoking does not cause harm to unborn babies	1 (3.3)	23 (19)	0.2 (0.03, 1.57)	0.128

Stopping smoking increases the chance of having a healthy baby	27	(90)	77	(65)	3.3 (1.03, 10.33)	0.045
If you are around a lot of smoke from other people you might as well keep smoking yourself	9	(30)	41	(34)	0.8 (0.33, 1.79)	0.545
It's OK to drink alcohol when you're pregnant as long as you don't drink a lot	2	(6.7)	20	(17)	0.4 (0.08, 1.68)	0.195
Quitting smoking is just too hard. It's not worth the effort	0	(0)	25	(21)	-	0.005***
Cannabis ^b is OK when you're pregnant because its natural	0	(0)	8	(6.8)	-	0.135***
Its harder to quit smoking during pregnancy because of all the worries	2	(6.7)	60	(50)	0.07 (0.02, 0.36)	0.001
You've got to die of something, so why give up the things you enjoy?	2	(6.7)	24	(20)	0.4 (0.08, 1.50)	0.160
Women will try to give up smoking and drinking for their children even if they won't try for themselves	15	(50)	61	(51)	0.8 (0.35, 1.87)	0.616
In our community its OK to smoke when you are pregnant	3	(10)	29	(25)	0.3 (0.09, 0.90)	0.032
Most women have bigger problems to deal with than trying to quit smoking and drinking	4	(13)	47	(40)	0.3 (0.07, 0.96)	0.044
Health care providers should tell pregnant women to quit smoking tobacco	28	(93)	89	(75)	3.9 (0.59, 25.64)	0.158
Health care providers should tell pregnant women to quit using alcohol and drugs	28	(93)	90	(77)	3.1 (0.37, 26.89)	0.294

* 2 of the continuing smokers did not answer any of the knowledge and attitude questions

** OR and p -value (Wald test) for agreement with each item for quitters relative to continuing smokers after controlling for years at school, post-secondary education, parity and state, and adjusting for clustering

*** p -value for univariate Pearson's chi-squared test as logistic regression analysis not possible as smoking status predicts response to this item perfectly.

a: smoking tobacco during pregnancy is not known to be associated with increased risk of high blood pressure

b: local colloquial names (yarndi, gunja) for cannabis were used in the questionnaire