

Maternal Tobacco use during Pregnancy in South Africa: Results from a National Population-based Survey

Abstract

Background: Tobacco use in pregnancy is linked with various negative health effects. The aim of this study was to examine the prevalence of maternal tobacco use during pregnancy and sociodemographic and health correlates. **Methods:** Data of ever pregnant women from the cross-sectional “South African National Health and Nutrition Examination Survey (SANHANES-1) 2011-12” were analyzed. The sample included 5089 adolescents and adult women aged 15–55 years. They responded to questions on tobacco use, sociodemographic and health indicators. **Results:** Results indicate that 5.0% [95% confidence interval (CI) = 4.3, 5.9] of South African women had engaged in tobacco use during their pregnancy. In adjusted analysis, being Colored and White population groups, poor self-rated health status, and having chronic medical conditions were associated with tobacco use during pregnancy. **Conclusions:** Findings suggest links between sociodemographic and health variables and prenatal tobacco use, which may have public health policy implications.

Keywords: Health status, mental health, pregnancy, South Africa, tobacco use

Introduction

Any form of tobacco use during pregnancy is linked with a number of negative fetal effects and maternal risks.^[1] Based on the “Demographic and Health Surveys (DHS),” the prevalence of maternal tobacco use during pregnancy among women (aged 15–49 years) from 54 low- and middle-income countries was 2.6%.^[2] In DHS surveys in Southern Africa, the prevalence of maternal tobacco use during pregnancy is ranged from 0.5% in Congo (Brazzaville), 0.6% in Malawi, and 0.8% in Mozambique to 7.6% in Namibia and 11.9% in Madagascar.^[2] There is a lack of national data on tobacco use during pregnancy in South Africa. Among pregnant women ($n = 394$) attending antenatal services in four South African cities, 47% of Colored (people of mixed descent) women, 4% of Black, and 3% of Indian smoked during pregnancy.^[3]

Correlates of tobacco use during pregnancy include sociodemographic factors such as women of younger age,^[4,5] lower socioeconomic status,^[4,6] and ethnicity or population group (Colored women).^[3] Moreover, stress,^[6] poor physical and mental health^[4,5] have been identified as

risk factors for maternal tobacco use during pregnancy.

The aim of this study was to examine the prevalence of maternal tobacco use during pregnancy and sociodemographic and health correlates.

Methods

Sample and procedure

The “South African National Health and Nutrition Examination Survey (SANHANES-1)” is a cross-sectional and multi-stage population-based household survey conducted in 2011–2012.^[7] Participants provided information on sociodemographic and health variables in face-to-face interviews after their informed consent was obtained. The current study sample is restricted to women who responded that they had ever been pregnant (during their lifetime) and were 15–55 years old. The study was approved by the “research ethics committee (REC) of the HSRC (REC 6/16/11/11).” The survey individual response rate of respondents was 92.6%.

Measures

Sociodemographic data included age, sex, employment status, population group, province, and residential status.

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Maternal tobacco use during pregnancy was assessed with the questions, “During any pregnancy in your lifetime, did you ever smoke tobacco or use any tobacco products?” (Yes, No). In addition, current daily tobacco use was assessed.^[7]

Maternal alcohol use during pregnancy was measured with the question, “During pregnancy, did you ever have a drink containing alcohol?” (Yes, No).^[7] In addition, *Risky or hazardous drinking* was assessed with the 3-item “Alcohol Use Disorders Identification Test–Consumption (AUDIT-C).” Total scores ranged from 0 to 12, with a score of 3 or more in women and 4 or more in men indicating risky or hazardous drinking or active alcohol use disorders^[8] (Cronbach’s alpha 0.89).

Self-rated health was assessed with the item: “In general, how would you rate your health today?”^[7] Responses were dichotomized into as having “good health” (=1: very good or 2: good) and “poor health” (=3: moderate, 4: bad, or 5: very bad).

Chronic conditions were measured with the questions, “Has a doctor or nurse or health worker at a clinic or hospital told you that you have had any of the following conditions? High blood pressure, stroke, heart disease, a heart attack or angina (chest pains), high blood cholesterol, high blood sugar or sugar diabetes.”^[7] In addition, participants were asked if they ever had been diagnosed with tuberculosis (Yes, No).^[7]

Experience of trauma events. Participants were asked, “Have you ever experienced any of the following events?” (14 events e.g. “severe automobile accidents” and “learned about the sudden, unexpected death of a family member or a close friend?” (Yes or No).^[7]

Post-traumatic stress disorder (PTSD) in the past week was measured with the “Davidson Trauma Scale (DTS).”^[9] Partial PTSD was defined as having at least one PTSD symptom from each of the three PTSD symptom clusters^[10] (Cronbach’s alpha 0.94).

Insomnia was measured with two items: 1) on the severity of nocturnal sleep problems, “Overall in the last 30 days, how much of a problem did you have with sleeping, such as falling asleep, waking up frequently during the night, or waking up too early in the morning?” and 2) the severity of difficulty with daytime functioning, “Overall in the last 30 days, how much of a problem did you have due to not feeling rested and refreshed during the day e.g., feeling tired or not having energy?” Response options ranged from 0 = none to 4 = extreme/cannot do^[11] (Cronbach’s alpha 0.82). Insomnia symptoms were classified similar to the “Insomnia Severity Index,”^[12] with significant insomnia symptoms having total scores of ≥ 4 –8.

Psychological distress in the past 4 weeks was assessed with the 10-item Kessler 10,^[13] which has been validated

in South Africa^[14] (response options: 1 = never to 5 = all of the time). Total scores of 30 or more indicate severe psychological distress^[13] (Cronbach’s alpha 0.93).

Data analysis

Data were analyzed using the STATA software version 13.0 (“Stata Corporation, College Station, Texas, USA”). Pearson Chi-square statistics were used to test for differences in proportions. We used multivariable Poisson regression to compute the prevalence ratios (PRs) (with 95% confidence interval = CI) to determine the associations between sociodemographic and health characteristics and maternal tobacco use during pregnancy. No collinearity was identified. Missing data were not included in the analysis. All models were adjusted for the multi-stage sampling design.

Results

Sample characteristics

The total sample included 5089 women who had been pregnant and were 15–55 years old, with a median age of 35.0 years [interquartile range (IQR) = 15] from South Africa. The majority (80.0%) belonged to the Black African population group, 39.6% were employed, and 63.7% were residing in urban areas. About one in five of the participants (23.3%) rated their health as poor, 25.2% had one or more chronic conditions, 7.0% had ever been diagnosed with tuberculosis, 20.2% had experienced one or more traumatic events, and 4.4% had a partial PTSD. In all, 7.4% of participants reported insomnia symptoms, 2.3% severe psychological distress, 3.7% had been using alcohol during their pregnancy, 9.1% were currently daily tobacco users, and 11.9% were hazardous or harmful alcohol users.

Overall, 5.0% had been using tobacco when they were pregnant, 28.1% among the Colored population group, 20.8% in the Western Cape province, and 19.9% in the Northern Cape province. In bivariate analysis, the prevalence of tobacco use during pregnancy was higher in urban than rural areas, in participants with poorer self-rated health status, having ever been diagnosed with tuberculosis, having insomnia symptoms, and psychological distress. Almost one-thirds (31.5%) of prenatal smokers had also been using alcohol during pregnancy, and almost half (44.3%) of prenatal smokers were current daily tobacco users [Table 1].

Associations with maternal tobacco use during pregnancy

In adjusted analysis, being Colored and White population groups, poor self-rated health status, and having chronic medical conditions were associated with tobacco use during pregnancy [Table 2].

Discussion

To our knowledge, this is the first population-based national study assessing the prevalence of maternal tobacco

Table 1: Sample characteristics and weighted prevalence of tobacco use during pregnancy

Variable		Sample <i>n</i> (%)	Smoke tobacco or use any tobacco products during pregnancy % (95% CI)	Chi-square <i>P</i>
Sociodemographic				
Age (years)	All	5089	5.0 (4.3, 5.9)	0.073
	15-24	862 (15.0)	3.3 (2.2, 4.8)	
	25-34	1451 (32.9)	4.7 (3.6, 6.1)	
	35-55	2776 (52.2)	5.3 (4.3, 6.6)	
Population group	Black African	3457 (80.0)	2.0 (1.5, 2.6)	<0.001
	White	198 (8.1)	4.4 (2.2, 8.9)	
	Colored	1036 (9.8)	28.1 (23.2, 33.4)	
	Indian or Asian	343 (2.1)	5.5 (2.6, 11.4)	
Province	Western Cape	753 (11.7)	20.8 (15.4, 27.4)	<0.001
	Eastern Cape	524 (11.3)	3.9 (2.4, 6.2)	
	Northern Cape	332 (2.4)	19.9 (12.9, 29.4)	
	Free State	305 (5.4)	6.4 (4.2, 9.6)	
	KwaZulu-Natal	802 (18.5)	1.6 (0.9, 3.1)	
	North West	619 (6.7)	2.4 (1.3, 4.6)	
	Gauteng	890 (25.4)	1.1 (0.6, 2.1)	
	Mpumalanga	473 (8.0)	1.1 (0.4, 3.2)	
	Limpopo	400 (10.4)	2.5 (1.1, 5.4)	
	Not employed	3132 (60.4)	4.2 (3.1, 5.6)	
Employed	1860 (39.6)	5.3 (4.4, 6.5)		
Residence	Rural	1656 (36.3)	3.4 (2.3, 5.1)	0.034
	Urban	3132 (63.7)	5.6 (4.5, 7.0)	
Health variables				
Self-rated health status	Very good, good	3856 (76.7)	3.9 (3.2, 4.8)	<0.001
	Moderate, bad, very bad	1173 (23.3)	7.7 (6.0, 0.8)	
Chronic conditions	None	3515 (74.8)	3.9 (3.2, 4.8)	<0.001
	One or more	1300 (25.2)	7.5 (6.2, 9.2)	
Ever diagnosed with TB	No	4636 (93.0)	4.8 (4.0, 5.6)	<0.001
	Yes	343 (7.0)	8.7 (6.2, 12.1)	
Traumatic stress	None	4021 (79.8)	4.7 (4.0, 5.5)	0.118
	One or more	899 (20.2)	6.0 (4.5, 7.9)	
PTSD	None	4824 (95.6)	4.9 (4.1, 5.9)	0.534
	Partial	197 (4.4)	3.3 (1.7, 6.5)	
Insomnia	0-3	4647 (92.6)	4.7 (3.9, 5.7)	0.046
	4-8	359 (7.4)	6.2 (4.0, 9.7)	
Psychological distress	<30	4808 (97.7)	4.8 (4.1, 5.7)	<0.001
	30 or more	127 (2.3)	11.9 (7.4, 18.6)	
Alcohol use during pregnancy	No	4718 (96.3)	3.5 (2.9, 4.2)	<0.001
	Yes	234 (3.7)	31.5 (24.5, 39.4)	
Current tobacco use	None- <daily	4331 (90.9)	0.9 (0.7, 1.2)	<0.001
	Daily	660 (9.1)	44.3 (38.1, 50.7)	
Current alcohol use	Not hazardous or harmful	4328 (88.1)	3.6 (2.9, 4.4)	<0.001
	Hazardous or harmful	679 (11.9)	14.3 (11.2, 18.2)	

PTSD=Post-traumatic stress disorder; TB=Tuberculosis; CI=Confidence interval

use during pregnancy in South Africa. The study found a prevalence of 5.0% of maternal tobacco use during pregnancy in South Africa, which is double the global

average in low- and middle-income countries (2.6%), higher than in some countries in the Southern African region [Congo (Brazzaville): 0.5%, Malawi: 0.6%, and

Table 2: Multivariable logistic regression on tobacco use during pregnancy

Variable		APR (95% CI)	P
Sociodemographic			
Population group	Black African	1 (reference)	
	White	2.05 (1.04, 4.05)	0.039
	Colored	10.81 (7.94, 14.73)	<0.001
	Indian or Asian	1.66 (0.84, 3.27)	0.143
Residence	Rural	1 (reference)	
	Urban	0.96 (0.70, 1.32)	0.802
Health variables			
Self-rated health status	Very good, good	1 (reference)	
	Moderate, bad, very bad	1.53 (1.16, 2.01)	0.003
Chronic conditions	None	1 (reference)	
	One or more	1.54 (1.19, 2.00)	<0.001
Ever diagnosed with TB	No	1 (reference)	
	Yes	1.34 (0.93, 1.92)	0.120
Insomnia	0-3	1 (reference)	
	4-8	1.09 (0.77, 1.53)	0.702
Psychological distress	<30	1 (reference)	
	30 or more	1.75 (0.94, 3.24)	0.077

APR=Adjusted prevalence ratio (adjusted for all covariates listed in the table); CI=Confidence interval

Mozambique: 0.8%] and lower than in Namibia (7.6%) and in Madagascar (11.9%).^[2]

In agreement with previous studies,^[3,5] this study found that demographic characteristics (being from the Colored and White population groups), poor self-rated health status, and having chronic conditions increased the risk for maternal tobacco use during pregnancy. These risk groups should be specifically targeted with anti-tobacco use services.^[5] Further, the study found a particularly high prevalence of maternal tobacco use during pregnancy (around 20%) in two provinces (Western Cape and Northern Cape). These two provinces have the highest proportion of Colored population groups in South Africa, emphasizing the need to target the Colored female population with anti-tobacco use services.

Study limitations

The study variable of maternal tobacco use during pregnancy was assessed retrospectively over possibly long periods, and this may have introduced a recall bias. The cross-sectional nature of the study limits our ability to establish causality.

Conclusions

This investigation found a prevalence of 5.0% of maternal tobacco use during pregnancy. Risk factors identified (being Colored and White population groups, poor self-rated health status, and having chronic medical conditions) can help in identifying appropriate interventions.

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Conflicts of interest

There are no conflicts of interest.

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