

Smoking in urban pregnant women in South Africa

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Aim. To estimate the exposure to active and passive smoking of pregnant women in South Africa and to determine their knowledge and behaviour with regard to smoking during pregnancy.

Methods. A questionnaire was completed by pregnant women attending antenatal services in four South African cities. Questions were asked about smoking status, beliefs on the health effects of tobacco smoke during pregnancy, exposure to passive smoking and behavioural changes with regard to smoking during pregnancy. Women from different ethnic groups and social classes participated.

Results. The study population was 394 pregnant women. Of these 42% were black, 29% coloured and 10% Indian women, who used public antenatal services, and 19% were pregnant women (ethnicity unspecified) who attended private obstetric practices. Of the coloured women, 47% smoked; for the black and Indian women and those who attended a private practice, the smoking rates were 4%, 3% and 28%, respectively. Approximately 90% of the pregnant women knew it was unhealthy to smoke during pregnancy. Most women who smoked stopped or reduced tobacco use during their pregnancy. Of the pregnant women, 70% lived with at least one smoker in the house.

Conclusions. Few black and Indian pregnant women in South Africa smoke, while coloured pregnant women smoke heavily. Quitting programmes should be targeted at them when they attend antenatal services. Pregnant women and their families should be alerted to the impact of environmental tobacco smoke, since so many are passive smokers during pregnancy.

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The effects of tobacco use on the outcome of pregnancy have been known for about 40 years.¹ Since then, many reports have pointed to a range of smoking-related conditions that affect the unborn fetus of pregnant women who smoke.² Low birth weight (LBW) is the most common

reported effect of maternal smoking and is dependent on how heavily the mother smokes.³ In general, infants of smoking women weigh 200 - 250 g less at birth, placing them below the cut-off point for LBW more frequently than infants of non-smoking women. Other detrimental outcomes include an increase in preterm delivery, spontaneous, abortion, placenta praevia, abruptio placentae and bleeding during pregnancy.⁴⁻¹⁴ Kleinman *et al.*¹⁵ argued that if all pregnant women stopped smoking (30% of the study population), the number of fetal and infant deaths would be reduced by about 10%. Even the exposure to environmental tobacco smoke through passive smoking during pregnancy, has been shown to be associated with LBW.¹⁶⁻¹⁸

The most recent national survey of smoking in adults over 18 years conducted early in 1995 showed an overall rate of increase in smoking in South Africa of 1% per year since 1992.¹⁹⁻²¹ The rate of increase was greatest in the coloured population, which also has the highest smoking prevalence (59%), followed by Indians (36%), whites (35%) and blacks (31%). The overall rate of increase in smoking in coloured South Africans was 12% above the 1992 figure.

In the 1995 survey, smoking prevalence showed great gender differences in Indians (48% in men v. 6% in women) and blacks (53% in men v. 10% in women). The least difference was found in coloureds (58% in men v. 59% in women).²⁰ This smoking prevalence in coloured women suggests that a higher rate of LBW babies could be expected in this group of women than in other women in South Africa. Published South African data have indeed found this to be the case²¹ in Johannesburg and Soweto. Additional data from Rothberg *et al.*²² and Yach *et al.*²³ also found that smoking was associated with high LBW rates.

Smoking prevalences in pregnant South African women were unknown and prompted this study. The objectives were to estimate the exposure to active and passive smoking of pregnant women in South Africa, and to determine their knowledge and behaviour with regard to smoking during pregnancy.

Methods

The study population comprised a convenient sample of pregnant women attending typical antenatal services in four South African cities during 1992, Johannesburg, Cape Town, Port Elizabeth and Durban. The sampling was intended to be representative of pregnant women from various socio-economic backgrounds. The women who attended public antenatal services were coloured, Indian and black, and mostly of lower socio-economic standing. A fourth group of pregnant women (ethnicity unspecified), who attended private obstetric practices in the four cities, was mostly of a higher socio-economic standing. The sampling procedure involved recruitment of pregnant women in each ethnic group who had visited an antenatal clinic on 1 of 2 consecutive days. Black participants were recruited from one antenatal clinic in each of the four cities. Coloured participants were drawn from two clinics in Cape Town and two in Johannesburg and Indian participants were selected from two clinics in Durban. On the same days that clinics were visited, private gynaecological practices in each city were also visited, where private patients were recruited.

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A questionnaire was completed by each patient. Questions were asked about their knowledge of the dangers of smoking and passive smoking to themselves and their unborn babies and about their own smoking patterns. The number of smokers in their homes and any change in their smoking patterns before or during pregnancy were recorded.

A pilot study was conducted to test the questionnaire and the data collection procedures. The self-administered questionnaires were translated into English, Afrikaans, Xhosa and Zulu for use by the participants. Permission was obtained from the relevant health authorities and consent was sought from each woman after an explanation of the aim and methods of the survey.

Results

There were 394 women who volunteered to participate in the study. The overall response rates in the antenatal clinics and private practices were 83% and 77%, respectively. The women's mean age was 23 ± 4.5 years. Table I shows a breakdown of the categories of women in the study and their smoking status.

Overall, 21% of pregnant women smoked. The lowest smoking rate was found in black and Indian pregnant women. The second highest rate was found in patients attending private practices and the highest smoking rate was found in coloured women. The highest proportion of ex-smokers were patients at private practices.

Only 30% of all the pregnant women participating in the study were not exposed to any tobacco smoke, and almost 50% of all the pregnant women were passive smokers. The highest proportion of women not exposed to any tobacco smoke (57%) were those attending private practices. Only about 12% of coloured and Indian women were not exposed to any tobacco smoke, and in the Indian community 85% were passive smokers.

Of the 81 women who smoked, 75% smoked between 1 and 9 cigarettes per day, 22% between 10 and 15, and 3% more than 15 cigarettes per day. The median number of cigarettes smoked per day was 5.

From Table II it is clear that most pregnant women believed that smoking or being exposed to smoke was bad for their own health as well as that of their unborn babies. Approximately 8 - 9% of women actually thought that passive smoking and active smoking were either good for their health or had no effect on their health or that of their babies.

Table II. Beliefs about the health effects of exposure to tobacco smoke (N = 394) (%)

	Impact on your own health	Impact on your unborn baby's health
Active smoking:		
Is good for your health	3.1	1.3
Is bad for your health	88.8	92.1
Has no effect on your health	8.1	6.6
Passive smoking:		
Is good for your health	2.5	1.3
Is bad for your health	89.6	91.1
Has no effect on your health	7.9	7.6

It would seem that knowledge of the detrimental effects of smoking on their own and their babies' lives motivated women to change their smoking patterns before or during pregnancy, as can be seen in Table III. Most of the women who smoked attempted either to reduce their smoking before becoming pregnant or stopped smoking or smoked less than before they became pregnant. When comparing the efforts of coloured women with those of the other women who changed their smoking patterns, it is evident that they seemed less successful in quitting smoking than the smokers from the other groups.

Table III. Smoking behaviour of women in relation to their pregnancy

	Coloured women who smoked before their pregnancy (N = 60) (%)	All other women who smoked before their pregnancy (N = 45) (%)
Stopped smoking before falling pregnant	11.7	24.4
Tried to stop smoking	13.3	8.9
Stopped smoking	10.0	22.2
Smoked less than before	46.7	35.6
Started smoking	3.3	2.2
Continued smoking as before	15.0	6.7

Table IV shows the extent of passive smoking in the pregnant women in the study. About 50% of women lived with one or two smokers in their homes, while 19.6% of women lived with more than two smokers. Five women who smoked had no other smokers in their homes. Women who smoked themselves during pregnancy lived in homes with significantly more smokers than in the homes of non-smoking women.

Table I. Smoking status of the study population of pregnant women

	Black women	Coloured women	Indian women	Private practice women	Total
No. of participants	166	113	39	76	394
Study population (%)	42.1	28.7	9.9	19.3	
Age (yrs) (mean \pm SD)	21.3 ± 3.9	21.7 ± 3.6	21.6 ± 3.4	27.4 ± 4.6	
Women who never smoked (%)	93.4	46.0	92.3	63.2	73.9
Women who smoked previously (%)	3.0	7.1	5.1	9.2	5.6
Women who currently smoke cigarettes (%)	3.6	46.9	2.6	27.6	20.6
Passive smokers (%)*	62.0	41.0	85.0	15.0	49.0
Women not exposed to any tobacco smoke (%)	34.4	12.1	12.4	57.4	30.4

All percentages are calculated with the total number of pregnant women in each group as denominator.
* Passive smokers are found in both 'never smoked' and 'previously smoked' categories.

Table IV. Passive smoking experience of 193 pregnant participants in their homes (%)

Lives with one other smoker	50
Lives with two other smokers	29
Lives with more than two other smokers	21
	100
Mean \pm SD number of smokers in homes of women non-smokers	1.8 \pm 1.1*
Mean \pm SD number of smokers in homes of women who smoke	3.0 \pm 3*

* There is a statistically significant difference (2-sample *t*-test; $P < 0.001$) between these two figures.

Discussion

This study found low smoking rates in black and Indian pregnant women, with an exceptionally high prevalence in coloured pregnant women. It is of concern that so many coloured women and women attending private practices smoked, despite their high level of knowledge of the detrimental effects thereof on their own health and that of their unborn children.

Most women in this study who were smoking at the time of their pregnancy attempted either to stop or to reduce their tobacco consumption before pregnancy to protect their unborn child. During pregnancy there is frequent contact with health professionals, making it an ideal opportunity for intervention,²⁴ particularly since so many women smokers in this study attempted to change their smoking patterns (the contemplative stage of smoking cessation).²⁵

Pregnant women appear to quit smoking more frequently than other women, and the relapse rate after quitting is lower among pregnant women than others.²⁶ Unfortunately, pregnant women who quit during pregnancy tend to resume the habit after delivery as frequently as quitters from the general population.²⁷ This suggests that the opportunity for intervention that exists during pregnancy is short-lived, and ongoing intervention activities will have to be provided when these women return to the health services with their babies if their quitting or reduced tobacco use is to be maintained and their young children protected against exposure to tobacco smoke.

Only about 15% of pregnant women in this study started smoking or maintained their level of smoking and could therefore be classified as pre-contemplators in the phi-pattern of the motivational stage of smoking cessation, as described by De Vries and Backbier.²⁵ They found that these pre-contemplators had a more negative attitude towards quitting than other groups. A Swedish study by Olsen²⁸ found that the strongest predictors of unsuccessful smoking cessation during pregnancy were a high level of smoking prior to the pregnancy, high coffee consumption and having a partner who smoked. Parity, school education and social status also played a role, but were less strongly associated with continued smoking during pregnancy.²⁸ These findings suggest that part of a successful comprehensive smoking cessation programme for pregnant women would be the identification of these pre-contemplating women and, specifically, helping them cease smoking.

A major concern arising from this study was the high rate of non-smoking pregnant women who were passive smokers. This was particularly the case among the black

and Indian women, who themselves had very low smoking rates during pregnancy. About 68% of these pregnant women lived with one or more smokers in their homes (Table IV). In a Swedish study, Rubin *et al.*¹⁷ found that on average the birth weight of a baby was reduced by 120 g per packet of cigarettes or equivalent smoked in the house where the pregnant mother lived. This relationship was also evident in a multiple regression model, which controlled the mother's age, parity, alcohol and tobacco consumption, illness during the pregnancy, socio-economic standing and sex of the baby. The lower the socio-economic standing, the greater the effect of passive smoking. The impact on the baby's birth weight of smoking by the father was 66% that of active smoking by the mother.¹⁷ This is not surprising since several studies have shown that people exposed to tobacco smoke excrete significant levels of cotinine, the major metabolite of nicotine, in the urine.^{29,30} The cotinine level in the urine of women participating in this study was measured and confirmed the exposure of some pregnant women to passive smoking (K Steyn *et al.* — unpublished data). South African cigarette packets now carry warnings against the exposure of the unborn child to smoking during pregnancy.

In the objectives for the promotion of health and prevention of disease for the year 2000 in America a target was set of a maternal smoking rate of 10%.³¹ If this target is to be achieved in the USA, the LBW births attributable to smoking might be reduced from the smoking-related rate of 20 - 26% to that of 9 - 12%. Health care cost savings would range from \$22 million to \$59 million.³² In reality the smoking rate in the USA in pregnant women has decreased by only 0.3 - 0.5% per year since 1969. Therefore, by the year 2000 it could be estimated that the smoking rate in pregnant women will be 18%, far above the target of 10%. Windsor *et al.*³³ made a plea in the USA for the dissemination of successfully tested smoking cessation methods for pregnant women in order to achieve the health objectives by the year 2000.

Based on the results of randomised trials of smoking cessation during pregnancy, a cost-benefit/cost-effectiveness analysis was done for smoking cessation programmes to prevent LBW and perinatal mortality. The ratio of savings to costs was more than 6:1 when preventing LBW in babies, their expensive intensive care and the perinatal mortality caused by smoking during pregnancy. The estimate included the reduction in long-term care for infants with disabilities secondary to LBW.³⁴

Currently, smoking cessation programmes do not exist for pregnant coloured women attending health services in South Africa. Therefore, health education programmes to prevent exposure to tobacco during pregnancy need to be developed and implemented as an integral part of antenatal services. It is essential that we develop the smoking cessation programme skills of the staff of antenatal services who provide care for pregnant coloured women, in view of their high smoking rates.

In conclusion, this study shows a high rate of smoking in pregnant coloured women and a high rate of passive smoking in most pregnant women in South Africa, as well as the clear cost-benefits of smoking cessation during pregnancy, which point to specific requirements. Effective smoking cessation programmes must be developed and implemented as soon as possible, especially those that target coloured pregnant women. In the case of black and Indian women the focus must be on maintaining the low

rates of smoking currently prevailing. The new health warnings on cigarette packets at least mention the dangers of smoking during pregnancy. These warnings and the language in which they are expressed may not be clearly understood by all pregnant women in South Africa. Finally, effective media programmes directed at the public at large are required to highlight the dangers of passive smoking, especially to pregnant women and their unborn children.

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