Determinants of cigarette smoking in the black township population of Cape Town

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ABSTRACT There is concern about the increasing tobacco consumption in developing countries, especially in urban communities. Little information is available on the prevalence and determinants of smoking in black townships in South Africa. We therefore conducted a survey of the smoking practices in three such townships in Cape Town, in which 673 higher primary schoolchildren and 1320 adults were interviewed using a WHO questionnaire translated into Xhosa. Results were analysed using a multiple logistic regression model. In higher primary schoolpupils, boys smoked much more than girls [adjusted odds ratio (OR_a) = 17.8; 95% confidence interval (CI): 5.2–60.9]; and smoking prevalence increased with age (OR_a = 1.6; 95% CI: 1.3–1.9), peer pressure (OR_a = 4.4; 95% CI: 1.9–6.9), and poor health knowledge (OR_a = 3.1; 95% CI: 1.6–5.8). In adults, smoking prevalence was 53% in men compared to 6% in women. In men, an urban experience of 6 or more years was significantly associated with smoking (OR_a = 1.9; 95% CI: 1.2–3.0) after adjustment for age, health knowledge and occupation. No association was found between level of education and smoking prevalence. Men in higher paid occupations smoked more than those in low paid occupations (OR_a = 1.7; 95% CI: 1.0–2.8). Unemployment, however, was not associated with smoking prevalence. The findings emphasise the need for primary prevention of smoking in women and boys. Urbanisation and increased earning power appear to boost tobacco consumption in the absence of active anti-smoking efforts.

There is growing concern about increasing tobacco consumption in the developing countries of the world.^{1,2} The detrimental effects of smoking on health have been extensively documented³ and there remains a need to design and implement anti-smoking campaigns. However the success of any intervention depends to a great extent on a thorough understanding of the determinants of the high risk behaviour.⁴

High smoking rates in black men in South Africa have been reported.^{5,6} However there is scanty information regarding the determinants of smoking in this group. Potential factors associated with smoking include urbanisation, improved earning capacity, targeted advertising and a general social acceptance of smoking in men. As urbanisation is a major development force in southern Africa,⁷ it is of importance to investigate the impact of urbanisation on smoking behaviour. In this paper we examine the determinants of cigarette smoking in the black township population of Cape Town with a view to the design and implementation of appropriate interventions.

Methods

Using World Health Organisation (WHO) guidelines,⁸ a survey was conducted in the school and adult population of the black townships in Cape Town. Three areas were selected for the survey in order to reflect differing levels of urbanisation: Langa (a settled urban community), Khayelitsha (a community of intermediate urban status), and Site B (a population of recent arrivals in an urban environment). For the school survey, one higher primary school was selected in each township. In the adult survey a random cluster sample (24 clusters of ~18 people) was taken in each area. Details of the sampling and interviewing procedures are summarised elsewhere.⁹

Smoking status was based on self reported cigarette consumption, since over 90% of all tobacco consumed in the townships was in this form.⁹ In school pupils, both daily and occasional smokers were included as smokers. Only daily smokers were considered as smokers in the calculation of smoking prevalence in the adult survey.

The index of urban experience used was the number of years an individual had spent in an urban environment. The classification of occupational status was done on the basis of the Centre for Applied Social Sciences provisional index for occupational categories.¹⁰

Odds ratios and their corresponding confidence intervals were calculated according to the method described by Mantel and Haenszel.¹¹ Multiple logistic regression was performed using the SAS Logist procedure¹² and odds ratios for specified subgroups were calculated according to Schlesselman.¹³

Results

Demographic data on the 673 schoolpupils and 1320 adults interviewed are shown in table 1.

Table 1 *Demographic data on respondents in the school and adult surveys*

	Male	Female	Total
<i>School survey</i>			
School: Langa	120	133	261
Khayelitsha	101	103	204
Site B	83	125	208
Total	312	361	673
Age range in years	10-21	9-19	9-21
Mean age in years	14.3	13.5	13.8
<i>Adult survey</i>			
Township: Langa	176	251	427
Khayelitsha	200	259	459
Site B	181	253	434
Total	557	763	1320
Age range in years	16-81	15-97	15-97
Mean age in years	34.9	34.2	34.5

DETERMINANTS OF SMOKING IN SCHOOLPUPILS

The smoking prevalence in girls was 0.8%, whereas in boys it was 23.7%. In boys, there was an increase in smoking prevalence with increasing age, from 6.3% in the under 12 age group to 45% in the 16 years and older group.

Social influences on boys' smoking behaviour are summarised in table 2. Peer pressure (having a best friend or brother who smokes) was strongly associated with being a smoker [odds ratio (OR)=5.7; 95% confidence interval (CI): 3.5-10.4] whereas inter-generational pressure (having a father, mother, grandfather or grandmother who smokes) showed little association. The very low rates of smoking among schoolgirls prevented a similar analysis in this group.

The knowledge and attitudes of black schoolpupils towards smoking were investigated by contrasting

Table 2 *Social influences on boys' smoking behaviour: percentage of smokers and non-smokers with a best friend or family member who smokes*

	Percentage		Odds ratio	95% CI*
	Smokers	Non-smokers		
Best friend	74	31	5.7	(3.5-10.4)
Brother	69	40	3.3	(1.8-6.1)
Father	44	43	1.1	(0.6-1.9)
Grandfather	24	21	1.2	(0.6-2.3)
Grandmother	5	5	1.1	(0.3-3.8)
Mother	9	3	3.4	(1.0-11.4)
Sister	4	4	0.9	(0.2-3.9)

* 95% confidence intervals calculated under the assumption that the data were derived from a simple random sample

responses to a set of questions on the health effects of smoking. Smokers consistently demonstrated less awareness of the harmful effects of smoking on health compared to non-smokers. In boys 49% of smokers and 77% of non-smokers affirmed that smoking was harmful to health (OR=3.5; 95% CI: 2.0-6.1).

The major determinants of smoking in black higher primary schoolpupils, based on a multiple logistic regression model, are summarised in table 3. The model consisted of four independent variables: age as

Table 3 *Determinants of smoking in three black higher primary schools in Cape Town: results of a multiple logistic regression model*

Variable		Beta coefficient	Standard error of beta coefficient	Odds ratio	95% CI on odds ratio
Age*	9-21 yrs	0.439	0.092	1.6	(1.3-1.9)
Sex	girl	—	—	1.0	—
	boy	2.881	0.627	17.8	(5.2-60.9)
Best friend	no	—	—	1.0	—
smoker	yes	1.294	0.325	4.4	(1.9-6.9)
Health	good	—	—	1.0	—
knowledge	poor	1.120	0.324	3.1	(1.6-5.8)
School	Site B	—	—	1.0	—
	Langa	-0.052	0.421	1.0	(0.4-2.2)
	Khayelitsha	-0.189	0.387	0.8	(0.4-1.8)
Intercept		-10.376	1.564	—	—

* Age was modelled as a continuous variable (ranging from 9-21 years) and hence the odds ratio relates to the odds on smoking in the (x + 1) year age group versus the odds on smoking in the x year age group.

a continuous variable ranging from 9 to 21 years; sex, with girls as the reference group; health knowledge, with those answering true to the question that smoking is harmful to health as the reference group; and school, with Site B as the reference group. The dependent variable was smoking status, coded as a dichotomous variable.

The following factors were found to be associated with smoking: being male, increasing age, having a best friend who is a smoker, and poor health knowledge. For every year increase in age the odds ratio for smoking increased by 1.6 (95% CI: 1.3–1.9). The odds on being a smoker for a 15 year old boy, whose best friend was a smoker and whose health knowledge was poor compared to his 14 year old counterpart whose best friend was a non-smoker and whose health knowledge was good were 17.3 (95% CI: 6.7–44.3). Despite the fact that the school survey was conducted in three different townships, the smoking prevalence was similar in the three schools surveyed.

DETERMINANTS OF SMOKING IN ADULTS

Of the 557 men interviewed 295 (53%) were daily smokers. In women, 46 (6%) of 763 smoked daily. The different urban experience of the townships sampled is indicated by the proportion of respondents who were lifetime city dwellers: 66% in Langa, 41% in Khayelitsha, and 8% in Site B. The proportion of male respondents who were daily smokers was 49% in Langa, 59% in Khayelitsha, and 49% in Site B.

The relationship between smoking prevalence and urbanisation (expressed as the number of years spent in an urban environment) is summarised in table 4.

Table 4 *The relationship between smoking prevalence and the number of years spent in the city*

		<i>Years spent in city</i>			
		0–2	3–5	6–15	16+ *
Men:	Number	64	55	117	321
	Daily smokers (%)	42	44	59	54
Women:	Number	114	85	152	412
	Daily smokers (%)	7	4	4	7

* Includes people who have spent their whole life in the city

Men who were resident in an urban environment for more than 5 years had a significantly higher smoking prevalence than those who had spent 5 years or less in

the city (OR = 1.7; 95% CI: 1.1–2.5). However, in the group who had spent more than 5 years in the city, no increase in smoking was found with longer exposure to the urban environment. In women, no such association was evident.

The effect of education on smoking prevalence was investigated. For men no association was found between the level of education (measured in six categories: none, lower primary, higher primary, secondary school, high school and university) and smoking prevalence or the mean number of cigarettes smoked.

The relationship between occupational status and smoking prevalence is summarised in table 5. In men, there was a tendency for higher paid occupations, namely semi-skilled, clerical and professional groups, to smoke at a higher rate and to smoke more cigarettes per day than lower paid men. For women the overall low smoking figures obscured any potential association between occupation (or education) and smoking prevalence.

There was an association between being a daily smoker and having a poor knowledge with respect to the health hazards of smoking. Seventy three percent of adult non-smokers were aware of the health effects of smoking compared to 58% of smokers (OR = 2.0; 95% CI: 1.6–2.6). The effects of being a radio listener and smoking status were also investigated. The prevalence of smoking in men who were daily radio listeners was 54.6% compared to 49.2% in non-daily radio listeners (OR = 1.2; 95% CI: 0.9–1.8).

In order to examine the effect of the urban environment on smoking prevalence in men with adjustment for the confounding effects of age, socio-economic status and health knowledge, a multiple logistic model was fitted. The results of this model are summarised in table 6. The model comprised four independent variables: urban experience—6 years or more in the city versus 5 years or less (reference group); age—25–44 years and 45 years and over versus under 25 years (reference group); health knowledge—good versus poor (reference group); and occupation—high pay, low pay (reference group), other and

Table 5 *The relationship between smoking prevalence and occupation*

		<i>Occupation</i>								
		<i>Unemployed</i>	<i>Student</i>	<i>Pensioner</i>	<i>Domestic</i>	<i>Unskilled</i>	<i>Routine</i>	<i>Semi-skilled</i>	<i>Clerical</i>	<i>Professional</i>
Men:	Number	183	33	15	13	88	102	49	39	14
	Daily smokers (%)	52	39	33	0	52	61	75	51	71
	Mean number of cigarettes	10.1	8.8	6.5	—	14.7	13.7	16.5	16.5	17.5
Women:	Number	390	45	31	146	6	35	5	34	34
	Daily smokers (%)	9	7	3	4	0	3	20	0	0
	Mean number of cigarettes	10.6	6.6	—	10	—	12.5	20	—	—

Table 6 *Determinants of smoking in black men in Cape Town townships: results of a multiple logistic regression model*

Variable		Beta coefficient	Standard error of beta coefficient	Odds ratio	95% CI on odds ratio
Urban experience	≤ 5 yrs	—	—	1.0	—
	6 yrs +	0.621	0.242	1.9	(1.2-3.00)
Age	< 25 yrs	—	—	1.0	—
	25-44	0.391	0.237	1.5	(0.9-2.4)
	45 yrs +	0.404	0.309	1.5	(0.8-2.7)
Health knowledge	good	—	—	1.0	—
	poor	0.850	0.193	2.3	(1.6-3.4)
Occupation	low pay	—	—	1.0	—
	high pay	0.540	0.257	1.7	(1.0-2.8)
	unemployed	0.049	0.219	1.1	(0.7-1.6)
	other	-0.773	0.324	0.5	(0.2-0.9)

unemployed. High pay included the categories semi-skilled, clerical and professional, and low pay the routine, unskilled and domestic workers.

Men resident in the urban area for 6 or more years, in the high paid group and having a poor health knowledge, were at the highest risk of being a cigarette smoker ($OR_a = 11.0$; 95% CI: 4.3-28.0) compared to the reference group. After adjustment for age, occupation and health knowledge, length of stay in the urban environment remained a significant determinant of smoking status ($OR_a = 1.9$; 95% CI: 1.2-3.0).

Discussion

The strongest determinant of smoking in the black township population of Cape Town is gender; young girls and women smoke at very low levels. In contrast, schoolboys take up the smoking habit in their early teens and by adulthood over half of all men are smokers. This pattern is suggestive of a society in which smoking is discouraged in women and accepted or even promoted in men. This finding is similar to the situation in developed countries in the 1920s and 1930s, which was followed by a steady rise in smoking prevalence among women.¹⁴ In view of the potential for a similar trend in township women, the need for primary prevention in this group is great.

Peer pressure, as measured by having a best friend or brother who smokes, was a strong predictor of smoking status in boys. However, the degree to which children choose friends who are similar to them, rather than their friends influencing their smoking behaviour, remains to be demonstrated. Moreover, children may overestimate the proportion of their peers who are smokers.¹⁵ Inter-generational pressure has little effect on smoking behaviour of boys. The

effect of peer pressure on adolescent smoking behaviour has been documented previously in both white and coloured schoolchildren in South Africa^{16,17} as well as in international settings.¹⁸ Congruence between parents and children's smoking behaviour has also been shown in other settings.¹⁹ Its absence in the townships suggests the presence of youth groups which cut across family ties, making the peer group influence greater. The importance of social pressure in promoting smoking in schoolboys and discouraging it in schoolgirls and women suggests that the creation of a non-smoking environment will have a beneficial effect on smoking rates.

Urban-rural differences in smoking rates have been shown before in South Africa. In a market survey done in 1984 the rural smoking rate was reported as 21.4% compared to an urban prevalence of 32%.⁵ Although our study was successful in selecting three townships with differing levels of urbanisation, there were no clear differences in smoking prevalence between townships. However, using the number of years spent in the urban environment as an index of urbanisation, an intra-urban differential was evident. Men who had spent 6 or more years in the city were more likely to be smokers compared to those with 5 or less years urban experience. Having lived in the city for longer periods did not further increase the smoking rates. This suggests that the impact of the urban setting is relatively sudden, reaching a saturation point beyond which it ceases to increase smoking prevalence further. Future studies should explore whether factors such as multiple media advertising, availability of cigarettes, and changing social perceptions are determinants of smoking in urban areas.

The relationship between socio-economic status and smoking behaviour shown in this study is a complex one. In general, however, township dwellers represent a working class population, with social class differences being obscured by racial divisions in the South African context. In this setting the level of education had no effect on the smoking status of men. Men with higher paid jobs were both more likely to be smokers and to smoke in greater quantities when compared to lower paid workers. Studies in more affluent populations have demonstrated a point of inflexion in the relationship between socio-economic status and smoking prevalence beyond which higher earnings are accompanied by a decline in smoking prevalence.²⁰ The black township population does not reflect this, possibly due to its homogeneity with respect to social class. This suggests that any increase in earning power on the part of township dwellers may lead to greater tobacco consumption in the absence of any anti-smoking effects.

In both the school and adult surveys, smokers showed a poorer understanding of the health hazards

of smoking. However, this finding must be interpreted with caution since in the process of translating the questionnaire from English into Xhosa many health knowledge questions ended up being phrased in a leading manner. In addition, the consistency between these measures and smoking practices may also be related to pro-smoking attitudes or defensiveness in smokers rather than knowledge per se. Experience in the USA with conventional anti-smoking programmes has indicated that changes in knowledge and attitudes about cigarette smoking do not necessarily lead to corresponding changes in smoking behaviour.⁴ Programmes which focus on the youth and address the underlying causes of the acquisition of the smoking habit and teach pupils to cope with the social and psychological factors that promote smoking have been more successful.²¹ In the South African context a better understanding of the social and psychological factors which protect black schoolgirls from smoking may prove useful in the design of innovative anti-smoking strategies.

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