ORIGINAL PAPER

Higher Prevalence Rates of Smoking in Rural than Urban Areas among School-Going Adolescents in the Lusaka Province, Zambia

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ABSTRACT

Objectives: The objective of the study was to compare prevalence rates of smoking in school-going adolescents among urban, peri-urban, and rural districts.

Design: Secondary analysis of the Zambia Global Youth Tobacco Survey (GTYS) data of 2007.

Main outcome measure: Tobacco smoking status.

Results: Totals of 2378 adolescents in Lusaka urban, 1756 in Kafue per-urban, and 1386 in Chongwe/Luangwa rural districts were enrolled into the study. Smoking rates were 10.5% in urban, 11.1% in peri-urban, and 13.5% in rural districts. After adjusting for age, sex, grade, parental and best friend smoking status, and knowing that smoking is harmful to health, compared to adolescents in Lusaka urban district, adolescents in Chongwe/Luangwa rural districts were 17% (AOR=1.17, 95%CI [1.10, 1.23]) more likely to smoke cigarettes. No significant difference in smoking rates was observed between adolescents in urban and peri-urban districts.

Conclusions: The prevalence rate of smoking among adolescents was higher in rural than urban district. Antismoking interventions should be more targeted to adolescents in rural than urban areas.

INTRODUCTION

Tobacco smoking is increasing in developing countries, and is linked to an increase in socioeconomic status despite the fact that it causes cancer and other diseases.[1] However, the results on the association between smoking and urbanization have not been consistent. While there was no significant difference in tobacco use between urban and rural children in Cameroon,[2] Steyn et al [3] found that smoking patterns were influenced by the degree of urbanization in women of the Cape Peninsula, South Africa. Further, a significantly higher total tobacco consumption in the urban than rural Tongans population was reported by Finau et al.[4]

With limited resources available for tobacco control, it is important that targeted interventions are conducted in areas with higher prevalence of tobacco smoking. And only in such areas would the impact of the intervention be easily evaluated. A pilot tobacco intervention is underway in Lusaka urban district, and a roll-out of the intervention should be in areas with high prevalence of smoking. The current study was conducted to compare smoking prevalence rates among urban, peri-urban and rural districts in the Lusaka province.

METHODS

Study design and sampling

Data from the Lusaka-Zambia GYTS conducted in 2007 was used in the current study. A two stage cluster sampling design was used. A total of 25 schools were selected first with probability proportional to their student enrolment size, and 24 (96.0%) participated. In the second stage of sampling, classes were randomly selected and 2678 students were sampled, out of whom 2378 (88.8%) eventually participated in the survey.

Questionnaire

A standard GYTS questionnaire with a few country-specific data was administered to students in their classrooms during one class period. A comprehensive description of the GYTS methodology has been reported elsewhere.[5,6] Students were asked the following question, among others: During the past 30 days (1 month), on how many days did you smoke cigarettes? Do your parents smoke? And do any of your friends smoke cigarettes?

Ethical considerations

The project coordinator for the Zambia 2007 GTYS provided the data for analysis.

Data Analysis

The GYTS data were analyzed in SPSS 11.5 (Chicago, IL, United States of America). As is the convention in the Global Tobacco Surveillance System (GTSS), current cigarette smoking was defined as having smoked a cigarette, even a single puff, within the last 30 days prior to the survey.[5-7] A weighted analysis was conducted to obtain the prevalence of current cigarette smoking, as well as other relevant characteristics.

We report results of bivariate logistic regression analysis as unadjusted odds ratios (ORs), while the results from multivariate analysis are reported as adjusted odds ratios (AORs).

RESULTS

Prevalence of tobacco smoking

Totals of 2378 students in Lusaka urban, 1756 in Kafue peri-urban, and 1386 in Chongwe/Luangwa rural districts participated in the survey. The prevalence rates for tobacco smoking were 10.5%, 11.1% and 13.5% in urban, peri-urban and rural districts, respectively.

Identification of confounding factors

Table 1 shows that all the factors considered in the analysis were confounding the relationship between district (urban, peri-urban, and rural) and tobacco smoking.

Table 1: Identification of confounding factors

	Exposure (District)			
	Urban	Per-urban	Rural	Outcome (Smoking)
Factor	N (%)	N (%)	N (%)	OR (95%ci)
Age (years)	P<0.001			P<0.001
≤11	151 (6.1)	125 (7.0)	86 (6.4)	1
12	256 (10.6)	148 (7.8)	114 (6.9)	1.00 (0.93, 1.09)
13	404 (16.7)	249 (12.6)	167 (11.0)	0.49 (0.45, 0.53)
14	517 (22.3)	364 (19.7)	260 (17.1)	0.61 (0.57, 0.65)
15	441 (19.1)	333 (19.9)	271 (21.3)	0.85 (0.80, 0.90)
16	343 (15.1)	283 (17.8)	251 (20.3)	1.03 (0.97, 1.09)
17+	250 (10.0)	236 (15.2)	217 (16.9)	2.03 (1.92, 2.15)
Sex	P<0.001			P<0.001
Male	1281 (43.2)	818 (45.8)	661 (45.3)	1
Female	1093 (56.8)	936 (54.2)	714 (54.7)	0.85 (0.83, 0.87)
Grade	P<0.001			P<0.001
7	1030 (44.1)	696 (34.6)	576 (36.0)	1
8	686 (22.5)	475 (24.1)	557 (26.5)	0.81 (0.77, 0.86)
9	660 (33.4)	1756 (41.3)	244 (37.6)	0.90 (0.86, 0.93)
Parental smoking status	P<0.001			P<0.001
None	1591 (77.2)	1060 (72.3)	846 (71.3)	1
Both	74 (3.4)	83 (5.6)	69 (5.0)	1.74 (1.59, 1.92)
Father only	354 (17.3)	286 (19.6)	286 (22.1)	0.89 (0.83, 0.95)
Mother only	41 (2.0)	40 (2.5)	25 (1.6)	2.32 (2.04, 2.63)
Best friends' smoking status	P<0.001			P<0.001
None	1613 (69.4)	1054 (60.6)	921 (69.8)	1
Some	533 (22.0)	487 (28.3)	319 (21.8)	0.85 (0.81, 0.89)
Most	120 (4.7)	126 (7.0)	88 (5.7)	1.67 (1.55, 1.79)
All	90 (3.9)	76 (4.2)	48 (2.8)	3.89 (3.59, 4.22)
Smoking is harmful to health	P<0.001			P<0.001
Definitely not	786 (33.8)	628 (36.8)	459 (31.4)	1
Probably not	245 (10.0)	226 (12.5)	147 (10.2)	1.38 (1.31, 1.47)
Probably yes	194 (7.9)	162 (9.1)	138 (10.5)	1.48 (1.39, 1.51)
Definitely yes	1141 (48.3)	719 (41.6)	635 (47.9)	0.66 (0.63, 0.69)

Relationship between District and Smoking

In bivariate analysis (Table 1), while respondents in a peri-urban district were less likely to smoke compared to respondents in an urban district, respondents in a rural district were more likely to smoke.

After adjusting for age, sex, grade, smoking status for parents and best friends, and knowing that smoking is harmful to health, the results did not significantly change. Compared to respondents in an urban district, respondents in a peri-urban district were 13% less likely to smoke; and respondents in a rural district were 20% more likely to smoke (Table 2).

Table 2: Relationship between district (urban, peri-urban, and rural) and smoking status.

District	Total	Smoker (%)	OR (95%CI)	AOR* (95%CI)
Urban	2378	10.5	1	1
Per-urban	1756	11.1	0.95 (0.91, 1.00)	0.87 (0.83, 0.92)
Rural	1386	13.5	1.19 (1.13, 1.24)	1.20 (1.14, 1.26)

DISCUSSIONS

We found a significant relationship between district (urban, peri-urban, and rural) and smoking status. Respondents in a rural district were more likely to smoke cigarettes. This finding contradicts the results of Walker [1] who reported that the prevalence of smoking was linked to an increase in socioeconomic status; and of Finau et al [4] who found significantly higher total tobacco consumption in the urban than rural Tongans population. It further contradicts the findings by Proctor et al,[2] who found no significant difference in tobacco use between urban and rural children in Cameroon.

While it has been generally reported that the prevalence of smoking is higher in developed countries than in developing countries, our finding suggests that this observation may not hold in other populations. Differences in smoking rates may be related to local cultural and social determinants, and not only to economic development. It is important to determine local smoking prevalence rates so that informed interventions may be instituted in areas of high prevalence rates. Factors driving the smoking epidemic should be considered in designing interventions for a targeted population.

There are limitations for the current study. For example, as in any cross sectional study, we cannot ascribe causation to the relationship between district and smoking. Further, the factors were self reported, and bias may have been introduced in our finding to the extent that the mis-reporting by the respondents differed among districts. There is no reason why the rate of mis-reporting should be different among districts. Although it is not possible to determine the magnitude and direction of the bias, it is believed that the effect of bias on the study finding may have been non-significant.

In conclusion, the finding that the prevalence rate of smoking was higher in rural than urban districts suggests that most antismoking interventions should be targeted to rural populations in the Lusaka province.

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