

## Prevalence and Determinants of Cigarette Smoking among in School Adolescents in Sokoto Metropolis, North West Nigeria

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**Abstract:** Cigarette smoking remains a huge public health problem and is still one of the leading preventable causes of morbidity and mortality worldwide. Individuals who are not smoking cigarette by the age of 20 are unlikely to become smokers. This study aims to determine the prevalence and risk factors for cigarette smoking among in school adolescents in Sokoto metropolis, North West Nigeria. The study was a descriptive cross-sectional design carried out in February 2012. A total of 228 respondents were recruited into the study from the secondary schools in Sokoto metropolis using 2 stage sampling technique. A set of semi structured questionnaire was used to obtain data from the respondents. Cigarette smoking prevalence was 8.3%. Majority of respondents (57.9%) smoked 1 stick of cigarette daily with 63.2% of respondents smoking cigarette for 1-10 days in a month. Respondents were more likely to smoke if they buy cigarettes ( $p = 0.000$ ) had fathers ( $p = 0.036$ ), brother ( $p = 0.016$ ) and friend who smokes ( $p = 0.002$ ). This study found a low prevalence of cigarette smoking among respondents. Buying cigarette and having friends who smoke were key determinants of cigarette smoking behaviour among the respondents. Sustained health education program should be implemented in secondary schools to reduce uptake of cigarette smoking among adolescents.

**Key words:** Prevalence, determinants, cigarette smoking, adolescents, in school

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### INTRODUCTION

Cigarette smoking remains a huge public health problem and is still one of the leading preventable causes of morbidity and mortality worldwide (Mpabulungi and Muula, 2004; Salawu *et al.*, 2009). It is a very wide spread activity and consumption of cigarette has today reached the level of a global epidemic (Can *et al.*, 2009).

Cigarette smoking has been associated with an extensive list of health disorders as well as reduction of life expectancy (Detels, 2002; Doll *et al.*, 2004). On the average cigarette smokers lose about 15 years of their life (WHO, 2008) and an estimated 4 million cigarette smokers die worldwide annually (The Global Youth Tobacco Survey Collaborative Group, 2002).

Several researchers have also reported that cigarette may be the first drug to be used by adolescents in a sequel that may include alcohol, marijuana and hard drugs, individuals who are not smoking cigarette by the age of 20 are unlikely to become smokers (Mayhew *et al.*, 2000; Faeh *et al.*, 2006; Siziya *et al.*, 2007).

Prevalence of cigarette smoking among secondary school students varies from one part of Nigeria to the other and it appears that the prevalence is higher in the

Northern part of Nigeria compared with the South (Omokhodion and Faseru, 2008; Salawu *et al.*, 2009; Yahya *et al.*, 2010; Adeyeye, 2011). Many factors have been put forward for adolescents' engagements in smoking.

These include normal developmental changes, psychological factors and social environment. Under normal developmental changes, influence of peers, the need to conform and direct craving for cigarettes use have been mentioned. For psychological factors, emotional problems such as low self esteem, dissatisfaction with life, less social confidence, need for approval, anxiety, restlessness and antisocial factors have been identified. Considering social environment, family influences (having parents who are unstable and engage in cigarette smoking) role of the media (for instance advertisements for cigarettes, portraying people who smoke cigarettes as sophisticated, sexy, manly in movies) have also been mentioned (Ojo *et al.*, 2008).

It is against this background that this study was conducted with the aim of determining the magnitude of cigarette smoking among in school adolescents as well as factors that determine cigarette smoking behaviour so that appropriate intervention can be later instituted to control this social problem.

**MATERIALS AND METHODS**

This study was carried out in Sokoto metropolis, North West Nigeria. Sokoto metropolis comprise of Sokoto North, Sokoto South, part of Wammako and Dange-Shuni Local Government Areas. There were 20 Senior Secondary (SS) schools in the study area and all the schools were enrolled for the study. The schools had a total student population of about 15,702 students.

This study was a descriptive cross-sectional design carried out in February 2012. The study population comprised of in school adolescents studying in senior secondary schools within the study area. Using the formula for cross-sectional study (Jekel *et al.*, 2001) and a prevalence of 17.1% from a earlier study (Odeyemi *et al.*, 2009) a total of 228 respondents were recruited into the study using a 2 stage sampling technique. In the first stage, 1 class from each arm of SS1 to SS3 was selected to participate in the study by simple random sampling technique (balloting), giving a total of 3 classes in each school. Thereafter (stage 2), in each class, proportional allocation of the respondents was done proportional to size and the students were selected through simple random sampling technique (balloting). The instrument of data collection was a 44 itemed self administered questionnaire (containing both open and closed ended questions), modified from the core questions of The Global Youth Tobacco Survey Collaborative Group (2002) (GYTS). The questionnaire contained 4 sections which sought information on respondent’s demographic characteristics, cigarette smoking related knowledge, attitude and behaviour.

The questionnaires were entered into and analyzed using SPSS Statistical Software Package Version 17. Analysis of data started with description of data using mean and standard deviation for quantitative variables, counts and frequencies for qualitative variables. This was followed by inferential statistics and multivariate analysis. Results were presented in form of charts and tables. All statistical tests were carried out using 2 tailed tests with alpha set at 0.05.

Approval for this study was sought and obtained from the ethical committee of Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto. Permission to carry out the study was obtained from heads of respective schools and informed consent was obtained from the students and guardians/parents.

**RESULTS**

Majority (89%) of the respondents were within the ages of 15-19 years with a mean age of

16.6±1.6 years. Most of the respondents were male (79.4%), muslim (71.9%) day students (68%). Hausa tribe was the most predominant ethnic group (57.5%) among the respondents. Most (38.6%) of the respondents’ fathers had post secondary education while most (30.3%) of the respondents mothers had secondary level education (Table 1).

Nineteen (8.3%) of respondents reported smoking cigarette, majority of respondents who reported smoking (57.9%) smoked 1 stick of cigarette daily (Fig. 1). The mean number of cigarette sticks smoked by respondents per day was 1.79±0.27 sticks (Fig. 2). Most of the respondents (63.2%) who reported cigarette smoking smoked cigarette for between 1-10 days in a month (Fig. 3). The mean number of days respondents smoked was 11.16±2.59 days. The 74% of these respondents initiated cigarette smoking by 15-19 years of age. The mean age of cigarette initiation was 15.26±1.1 years (Fig. 4).

Respondents’ buying of cigarette was associated with cigarette smoking habit of respondents (OR = 12.93), this was statistically significant (p = 0.000). The cigarette smoking habit of respondents’ fathers was associated with cigarette smoking habit of the respondents (OR = 3.45), this was also statistically significant (p = 0.0036).

Table 1: Socio-demographic characteristics of respondents

Variables	n (%)
<b>Age</b>	
10-14	25 (11.0)
15-19	203 (89.0)
Mean	16.6±1.6
<b>Sex</b>	
Male	181 (79.4)
Female	47 (20.6)
<b>Religion</b>	
Islam	164 (71.9)
Christianity	64 (28.1)
<b>Ethnic group</b>	
Hausa	131(57.5)
Fulani	19 (8.3)
Yoruba	31 (13.6)
Igbo	25 (11.0)
Others	22 (9.6)
<b>Nature of school</b>	
Day	155 (68.0)
Boarding	23 (10.1)
Mixed (both day and boarding)	50 (21.9)
<b>Educational status of respondents’ father</b>	
None	8 (3.5)
Quranic	43 (18.9)
Primary only	22 (9.6)
Secondary only	71 (31.1)
Post secondary	84 (38.6)
<b>Educational status of respondents’ mother</b>	
None	11 (4.8)
Quranic	60 (26.3)
Primary only	28 (12.3)
Secondary only	69 (30.3)
Post secondary	60 (26.3)

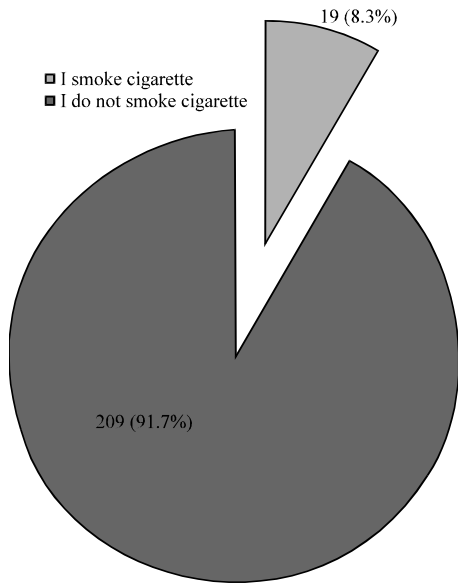


Fig. 1: Prevalence of cigarette smoking among respondents

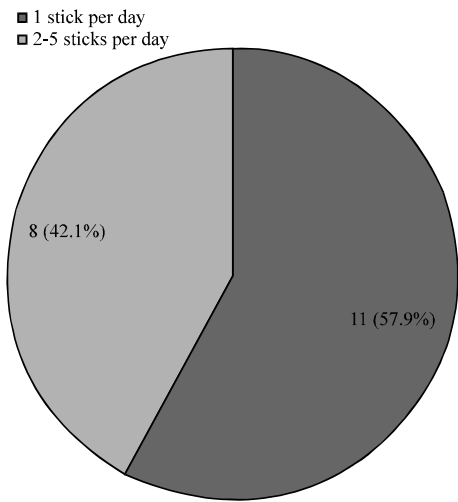


Fig. 2: Daily number of cigarette sticks smoked by respondents

There was also an association between respondents' having friends who smoke and cigarette smoking habit of the respondents (OR = 4.26), this was also statistically significant (p = 0.002). Respondents having brothers who smoke cigarette was associated with cigarette smoking habit of respondents (OR = 3.17), this was also statistically significant (p = 0.0016) (Table 2). Although, there was an association between respondents perception of smokers having more friends than non smokers with the cigarette smoking habit of respondents (OR = 2.6), this association was not statistically significant (p = 0.05).

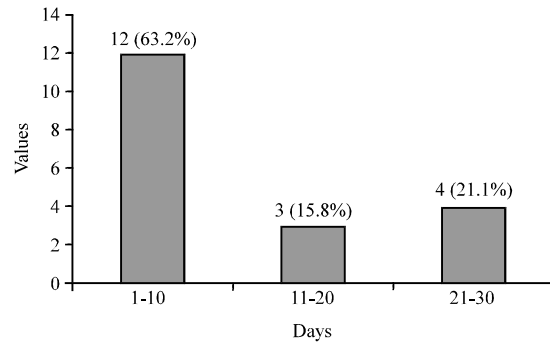


Fig. 3: Number of days in a month respondents smoked cigarette

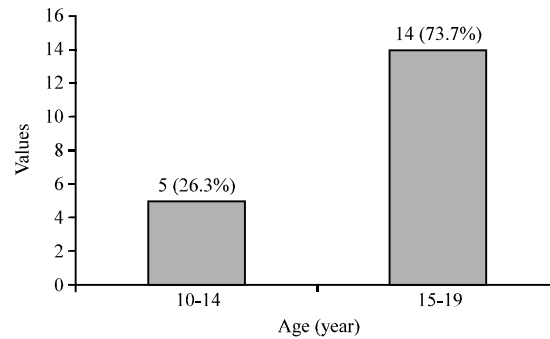


Fig. 4: Age at initiation of cigarette smoking

Table 2: Factors associated with cigarette smoking behaviour

Variables	Respondent smokes cigarette		Test statistics and p-value
	Yes	No	
<b>Age</b>			
10-14	1 (5.3)	24 (11.5)	OR = 0.428
15-19	18 (94.7)	185 (85.5)	$\chi^2 = 0.69$ , p = 0.495, df = 1
<b>Gender</b>			
Male	15 (78.9)	166 (79.4)	OR = 0.971
Female	4 (21.1)	43 (20.6)	$\chi^2 = 0.02$ , p = 0.96, df = 1
<b>Cigarette smoking associated with lung disease</b>			
Yes	17	199	p = 0.263 (Fisher's)
No	1	6	
I do not know	1	4	
<b>Cigarette smoking associated with heart disease</b>			
Yes	18	178	p = 0.582 (Fisher's)
No	1	14	
I do not know	0	17	
<b>Respondents' perception of smokers having more friends than non smokers</b>			
Yes	9 (50.0)	58 (27.8)	OR = 2.6
No	9 (50.0)	151 (72.2)	$\chi^2 = 3.94$ , p = 0.05, df = 1
<b>Respondents buying of cigarettes</b>			
Yes	13 (68.4)	30 (14.4)	OR = 12.93
No	6 (31.6)	179 (85.6)	$\chi^2 = 33.27$ , p = 0.000, df = 1
<b>Father smokes</b>			
Yes	4 (21.1)	15 (7.2)	OR = 3.45
No	15 (78.9)	194 (92.8)	$\chi^2 = 4.39$ , p = 0.036, df = 1
<b>Friend smokes</b>			
Yes	11 (57.9)	51 (24.4)	OR = 4.26
No	8 (42.1)	158 (75.6)	$\chi^2 = 9.87$ , p = 0.002, df = 1
<b>Brother smokes</b>			
Yes	8 (42.1)	39 (18.7)	OR = 3.17
No	11 (57.9)	170 (81.3)	$\chi^2 = 5.85$ , p = 0.016, df = 1

**Table 3: Determinants of cigarette smoking behaviour of respondents**

Variables	OR	95% CI	P-value
<b>Do you buy cigarette?</b>			
Yes	Ref.	0.035-0.321	0.000
No	0.11		
<b>Does your father smoke cigarette?</b>			
Yes	Ref.	0.091-2.300	0.342
No	0.46		
<b>Does your brother smoke cigarette?</b>			
Yes	Ref.	0.189-2.592	0.593
No	0.70		
<b>Does your best friend smoke cigarette?</b>			
Yes	Ref.	0.078-0.722	0.011
No	0.24		
<b>Do you think smokers have more friends than non-smokers?</b>			
No	Ref.	0.689-6.294	0.194
Yes	2.08		

Multivariate analysis showed that buying cigarette and having friends who smoke were key determinants of cigarette smoking behaviour of respondents. Respondents who do not buy cigarette had 89% reduction in odds of smoking cigarette compared with those who buy cigarette. Respondents whose friends do not smoke cigarette had 76% reduction in odds of smoking compared with those who had friends that smoke cigarette (Table 3).

### DISCUSSION

The study found the prevalence of cigarette smoking among in school adolescents to be 8.3%. This figure contrasts with some studies conducted in South West Nigeria which reported cigarette smoking prevalence of 3.4 and 5.3%, respectively (Adewole *et al.*, 2005; Omokhodion and Faseru, 2008). Some studies in Northern Nigeria have reported prevalence of 33.9% (Salawu *et al.*, 2009) and 21.3% (Yahya *et al.*, 2010) which is much higher than the figure obtained in the study. Similar studies conducted among adolescents in Saudi Arabia (Abolfotouh *et al.*, 1997), South Africa (Awotedu *et al.*, 2006) and Spain (Soria-Esojo *et al.*, 2005) have also reported higher cigarette smoking prevalence of 14.5, 19 and 27%, respectively.

Admittedly, the figure obtained from this study may not be alarmingly high but one would however caution that the figure obtained may be as a result of under reporting as some adolescents who smoke but may not reveal their smoking status even when asked under confidentiality. Even with this figure most of these children were under the supervision of their parents yet they smoked cigarette. One can imagine what will happen after secondary education when they find themselves in higher institutions and become more or less independent. Majority of the respondents were light smokers, smoking 1 stick of cigarette daily for between 1-10 days in a

month. This may mean that a great majority of these adolescent cigarette smokers are still experimenting as such they may be good candidates for smoking cessation programmes. Earlier researches conducted among adolescents both in and outside the country have reported respondents smoking about 8-10 sticks of cigarette per day (Al-Yousaf and Karim, 2001; Salawu *et al.*, 2009).

Majority of respondents initiated cigarette smoking by 15-19 years of age, this contrast with studies conducted in Borno State, North East Nigeria and Lagos State, South West Nigeria where majority of smokers initiated smoking within the ages of 13 and 15 years (Salawu *et al.*, 2009) and 10 and 14 years (Adeyeye, 2011), respectively.

The study did not find any statistically significant association between respondents' age, gender and their cigarette smoking status, there was also no significant association between respondents' knowledge of some of the effects of cigarette smoking and their cigarette smoking status. However, this study discovered that adolescents who had the perception that cigarette smokers have more friends than non smokers were more likely to be smokers (OR = 2.6) this was statistically significant. Respondents were also more likely to be cigarette smokers if they buy cigarettes (OR = 12.93). The association between buying and smoking of cigarette is not surprising when adolescents are in possession of cigarette they may get tempted to experiment with cigarette smoking; this may further lead to initiation and maintenance of cigarette smoking.

This study discovered that the odds for a respondents smoking cigarette if the father also smoked was 3.45. These figure is slightly higher when compared to studies carried out in Ethiopia, Thailand, South Korea were respondents with one or both parents who smoke had about 2 times the odds of smoking compared to those whose parents were non smokers (Rudatsikira *et al.*, 2007, 2008, 2009). The finding is much lower than that reported from a study conducted in Canada where respondents were 45 times more likely to be cigarette smokers if their father smoked (Leatherdale *et al.*, 2006).

Similarly the respondents were more likely to be cigarette smokers if they have a brother who smoked (OR = 3.17). This is much lower than result of a study in Canada where respondents were 67 times more likely to smoke cigarette if a brother smokes (Leatherdale *et al.*, 2006).

The odds of a respondents smoking cigarette if the friend smoked was 4.26. This finding is not surprising as people who smoke cigarette may likely keep the company of other cigarette smokers. The figure obtained in the

study is however slightly lower than that obtained in a study conducted in India where respondents were 5.24 times more likely to be a cigarette smoker when their close friend also smoked (Nichter *et al.*, 2004) but much lower when compared to a study carried out in South Korea and Thailand which reported that adolescents with close friends who smoked cigarette were 12 and 20 times more likely to smoke themselves (Rudatsikira *et al.*, 2008, 2009).

Result of multivariate analysis revealed that buying cigarette and having friends who smoke were key determinants of cigarette smoking behaviour of respondents. Respondents who do not buy cigarette had 89% reduction in odds of smoking cigarette compared with those who buy cigarette. Respondents whose friends do not smoke cigarette had 76% reduction in odds of smoking compared with those who had friends that smoke cigarette.

The association of respondents' cigarette smoking with that of parents and siblings obtained in this study is consistent with Bandura's social learning theory that suggests that friends and family members who smoked influence behaviour by providing social reinforcement for the behaviour and by modelling the outcomes associated with the behaviour (Leatherdale *et al.*, 2006). Cigarette smoking among parents, siblings and peer pressure among friends who smoke influence adolescent's cigarette smoking. Since, children view their parents as role models it will not be surprising when children of cigarette smokers start smoking. It is also important to note that when parents or older siblings smoke, cigarette stubs are readily available for early experimentation. Parental smoking may also affect their adolescents smoking status indirectly if smoking parents perceive themselves (and are concerned that their adolescents perceive them) as poor sources of antismoking messages because of the inconsistency between their attitude toward smoking and their actual smoking behaviour (Harakeh *et al.*, 2010). There is a need to educate parents that their children are more likely to smoke if they also smoke. This knowledge may encourage parents who smoke to stop smoking. Health education activity in the form of no-smoking clubs can be formed in schools that do not have them. The clubs activities can disseminate information on cigarette smoking to students on a regular basis. This may reduce cigarette smoking uptake among this group of adolescents.

### CONCLUSION

This study found a low prevalence of cigarette smoking among respondents. Buying cigarette and

having friends who smoke were key determinants of cigarette smoking behaviour among the respondents. Sustained health education program should be implemented in secondary schools to reduce uptake of cigarette smoking among adolescents.

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