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## SMOKELESS TOBACCO USE IN ADULT NIGERIAN POPULATION

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### ABSTRACT

**Objectives:** The study aim was to establish the prevalence and determinants of smokeless tobacco use in Nigerian adults' population.

**Methods:** A cross-sectional survey of 1776 adults in Yola, North-East Nigeria was carried out in June 2007. A modified World Health Organization (WHO) tobacco survey questionnaire was used for interview and data collection.

**Results:** Out of 1776 interviewed respondents, 133 (7.49%) were user of smokeless tobacco. Snuffing of tobacco powder was the most common method of using smokeless tobacco (6.8%). Fifteen (0.9%) chewed tobacco while only 2(0.1%) both chewed and snuffed tobacco. Social acceptance (21.8%) was the major reason for using smokeless tobacco. Males, 5th and 6th decades of life, poor education, lower socioeconomic class, Margi, Hausa and Fulani tribes were the determinants of smokeless tobacco use. About 89.5% of the smokeless tobacco users believed that smokeless tobacco was not harmful to their health.

**Conclusion:** Although the prevalence of smokeless tobacco use was low among Nigerian adult population in this study. Ignorance of the potential health dangers of smokeless tobacco was rampant therefore; concerted efforts should be made to discourage the use of all forms of tobacco rather than concentrating on cigarette smoking.

**Key Word:** Smokeless, tobacco, Nigerian, adult, population, prevalence *(Accepted 5 November 2009)*

### INTRODUCTION

Tobacco is an agricultural product from the fresh leaves of the plant in the genus *Nicotiana*<sup>1</sup>. It is commercially available in dried, cured, and natural forms. Besides smoking, it's chewed, "dipped" (placed between the cheek and gum), or sniffed into the nose as finely powdered snuff<sup>1</sup>. The tobacco plant contains an alkaloid called nicotine and the amount of nicotine absorbed by the body from tobacco use depends on many factors, including the type of tobacco, whether the smoke is inhaled, and whether a filter is used. The amount of nicotine absorbed through the use of smokeless tobacco is more than the amount delivered by a cigarette smoking<sup>1,2</sup>. The most harmful cancer-causing substances in chewed tobacco are tobacco-specific nitrosamines (TSNAs), which are 100 times higher than the nitrosamines in bacon, beer, and other foods<sup>1</sup>. The carcinogenic effect of tobacco has been established independently or in synergism with alcohol from studies on Head and neck cancers<sup>3,4</sup>. Smokeless tobacco has some serious health risks like cancer of the lip, tongue, pharynx, oesophagus and severe tooth and gum disease, peptic ulcers and dyspepsia<sup>2,5</sup>. Tobacco use kills nearly one-half of all lifetime users and about 70

million people died because of tobacco between 1950 and 2000<sup>6</sup>. Over the next fifty years, 450 million may to die of tobacco use<sup>6</sup>. The increasing prevalence of tobacco use is because of the strong tobacco advertisement and lobbying of government by the multinational tobacco companies as well as lack of effective tobacco control by the authorities. The outlawing of smoking in public places could increase the popularity of smokeless tobacco which is an alternative to tobacco smoking. Smokeless tobacco is consumed in most rural and urban areas of Nigeria for various reasons such as pleasure, "cure" for certain ailments, and as tradition in social gatherings in unspecified quantities without the knowledge of its potential dangers to health. Several studies on tobacco use worldwide focused mostly on cigarette smoking<sup>2</sup> and as such, the patterns of diseases related to tobacco use may likely highlight the contribution of tobacco from cigarette smoking without acknowledging the contributions of smokeless tobacco. There are few data on smokeless tobacco use in Nigeria and Sub-Saharan Africa. The aim of this study was to establish the prevalence and determinants of smokeless tobacco in adults Nigeria population.

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## METHODS

We conducted the study from 1st to 30th June 2007 in Yola South local council of Adamawa state, Nigeria. The state has land border with four other neighbouring state in Nigeria and the Republic of Cameroon. The minimum sample size was calculated using this Cochran formula  $N = \frac{d^2 (p) (1-p)}{c^2}$ . N was the minimum sample size, d was standard deviation at 95% confidence interval. The p was the prevalence taking as 50% because it was unknown; c was the acceptable error taking as 5%. The calculated minimum sample size was 384 and to allow for a response rate of 80% obtained from a piloted study, it was increased to 450. The subjects were selected by multistage (cluster) sampling technique and each subject gave verbal consent before participation. A pre- tested World Health Organization (WHO) tobacco smoking survey questionnaire<sup>8</sup> with some modification of socio-demographic characteristics, to reflect the ethnicity and culture of the study area was used to collect data from consented subjects. Other modifications were also carried out for correct wording and clarity as well as for easy administration among the subjects and these modifications has no effect on its content validity or the results obtained. Trained assistant administered the questionnaire face to face to the participating subjects. All the data were collected without personal identification of the subjects. The data were analyzed using SPSS Version 14 computer statistical software. Descriptive and frequency analysis was performed for the subjects' characteristic and Pearson's Chi-square was used to test for significance. A p value < 0.05 was considered statistically significant. The association between determinants of smokeless tobacco use was determined by odd ratio calculation. The ethical committee of Federal Medical Centre Yola approved the study.

### Definitions of smokeless tobacco users

User: used smokeless tobacco in < 6 months at the time of study

Non-user: never used smokeless tobacco/stop using smokeless tobacco in = 6 months

Ever user: used smokeless tobacco in a lifetime.

## RESULTS

One thousand seven hundred and seventy-six adult respondents out of 1814 selected from the households took part in the study, giving a response rate of 97.9%. Of 1776 subjects, 901(50.7%) were males and 875(49.3%) were females. The age ranges of respondents were 20-70 years with a mean of 40.4 ± 11.3 years. Table 1 shows the socio-demographic characteristics of the user and non users of smokeless tobacco. About 133 (7.5%) were user and

1643(92.5%) were non user of smokeless tobacco.

Table 1: **Socio-demographic Characteristics of the Study Subjects.**

Characteristics	User n (%)	Non-user n (%)	Total
<b>Age range (yrs)</b>			
15-19	0	26(15.8)	26
20-29	18(13.5)	452(27.5)	470
30-39	53(39.9)	620(37.7)	683
40-49	20(15.0)	365(22.2)	375
50-59	30(22.6)	140(8.5)	170
>60	12(9.0)	40(2.4)	52
<b>Sex</b>			
Male	97(72.9)	804(48.9)	901
Female	36(27.1)	839(51.1)	875
<b>Educational attainment</b>			
Primary	56(42.1)	376(22.9)	432
Secondary	39(29.3)	651(39.6)	690
Tertiary	25(18.8)	433(26.4)	458
None formal	13(9.8)	183(11.1)	196
<b>Socio-economic status</b>			
Low	120(90.2)	1247(75.9)	1447
High	13(9.8)	396(24.1)	409
<b>Ethnic tribes</b>			
Fulani	56(42.1)	314(19.1)	370
Others (15 tribes)	32(24.1)	923(56.2)	955
Hausa	19(14.3)	116(7.1)	135
Margi	10(7.5)	36(2.2)	46
Igbo	6(4.5)	70(4.3)	76
Bachama	6(4.5)	96(5.8)	102
Kilba	4(3.0)	88(5.4)	92
<b>Total</b>	<b>133(100)</b>	<b>1643</b>	<b>1776</b>

The non users consist of 8(0.45%) former-users and 1635 (92.1%) that never used smokeless tobacco in their lifetime. Those who had used smokeless tobacco in their lifetime (ever) was 141(7.94%).

Ninety-seven (72.9%) of the users were males while 36(27.1%) were females, giving a male to female ratio of 3:1. Mean age of the users was 43.2± 11.6years, ninety one (74.4%) of the users were < 50 years old. One hundred and twenty (90.2%) of the users belong to lower socioeconomic status while 13(9.8%) were in higher socioeconomic status.

Among the users of smokeless tobacco, 103(5.8%) snuffed tobacco powder, 2(0.1%) chewed and snuffed tobacco, 15(0.9 %) snuffed and smoked cigarette, 13(0.7 %) chewed and smoked cigarette. These are shown in table 2.

Table 2: **Methods of Smokeless Tobacco use.**

Methods	Number (N)	Percentage (%)
Snuffing	103	5.8
Snuffing /smoking	15	0.9
Chewing /smoking	13	0.7
Snuffing /chewing	2	0.1

A total of 120 (6.8%) snuffed tobacco and 15(0.9%) chewed tobacco, the prevalence of snuffing of tobacco powder was 6.8% and tobacco chewing was 0.9%. Sixty four (48.1%) of the users of smokeless tobacco were mild user, 60(45.1%) were moderate user and 9(6.8%) severe user of smokeless tobacco (n=133).

Table 3: **Reasons for using Smokeless Tobacco.**

Reasons	Number (N)	(%)
Social acceptance	29	21.8
Pleasure	20	15.0
Stress and anxiety	26	19.6
Treat dental caries	17	12.8
Cold weather	14	10.5
Other reasons	7	5.3
Smoking parent and guardian	6	4.5
Role model	6	4.5
Boost confidence	4	3.0
Own will	2	1.5
Peer pressure	2	1.5
<b>Total =133</b>		

Table 3 shows the reasons for using smokeless tobacco in the study population. Twenty-nine (21.8%) was due to social acceptance, 26(19.6%) was because of stress, 20(15.0%) due to pleasure and 17(19.6%) for treatment and prevention of dental caries.

Fourteen (10.5%) assigned to cold weather, 6(4.5%) was because of parental use and role model while 4(3.0%) to boost confidence.

The mean cost of buying smokeless tobacco product per day was 25 ±10 Naira (0.2 US dollars). Only 24(18.0%) of the users were previously advised by their doctors to quit smokeless tobacco use, however 10(7.5%) tried quitting tobacco use. Only 4 (50.0%) former users quitted smokeless tobacco use because of ill health, 2(25.0%) to social pressure while 2(25.0) to own will. Fifty-seven (42.9%) of the users of smokeless tobacco believed that tobacco smoking was harmful while 119(89.5%) smokeless tobacco believed it was not harmful even in public places. The multivariate logistic regression analysis shown in table 4 reveals a strong association between ever used smokeless tobacco and male gender, subjects in 5th and 6th decade of life, primary education and lower socioeconomic class. The Margi, Fulani and Hausa ethnic tribes were strongly associated with ever used smokeless tobacco. Alcohol drinking and cigarette smoking had no significant association with smokeless tobacco use in this study.

## DISCUSSION

This was a pioneer population based study on the use of smokeless tobacco with large sample size ever conducted in Nigeria. Most of the previous studies

done in Nigeria were on tobacco smoking with the main focus on cigarette smoking and little emphasis on the use of smokeless tobacco<sup>9-13</sup>.

The prevalence of lifetime (ever) use of smokeless tobacco in this study population was 7.94%. The prevalence of lifetime's use of smokeless tobacco in this study was similar to 8% in Canada however; it was lower than 23-47% in Pakistan, 19.1 % in United State America (USA)<sup>14-17</sup>. The disparities from other studies may be because of the long history of tobacco use and socio-cultural differences between the populations. There is a long history of medicinal use of tobacco leaf by native Indians in America while in Asia; smokeless tobacco is an integral culture of the South East Asians. Also the low prevalence of the use of smokeless tobacco in this study may be because of reduced availability and difficulty in buying the finished smokeless tobacco product compared to cigarette which is readily available over the counter in their vicinity.

The prevalence of smokeless tobacco use in male was 10.8% and in the female was 4.1% giving a male to female ratio of 3:1. The male predominance in this study in terms of prevalence, was similar to other studies in USA where male(15.8%) vs. female(1.5%)<sup>18</sup> and in Pakistan where male(21%) vs. female (12%) were users of smokeless tobacco<sup>19</sup>. In this study, smokeless tobacco use was more common from 3<sup>rd</sup> to 6th decade of life with a peak at 4<sup>th</sup> decade of life (39.8%). It was striking to note that about 74.4% of the subjects who used smokeless tobacco were <50years old and this may pose a serious concern for future health indices of the nation. The Fulani, Hausa and Margi tribes used smokeless tobacco more than other tribes in the region; this finding may be because they were the major tribes in the region. The socioeconomic status of any population depends on the occupational class and their education. Stratifying the subjects into low and high socioeconomic class, 90.2 % of the users of smokeless tobacco belonged to low socioeconomic class, while 9.8% belonged to high socioeconomic class. Our result agrees with other investigators in South East Asia<sup>20-22</sup> but different from a study in USA, where smokeless tobacco use was higher among those employed full-time and not consistently related to family income<sup>16</sup>. We found that the mean age of starting smokeless tobacco use was 21.5 ± 4.6years. This age was higher than 16-18 years for smokeless tobacco user in the US and 20 years for cigarette smoking in Nigeria, Kuwait and India<sup>12,13,24-26</sup>. Most people start using smokeless tobacco after 20 years probably because it's not readily available in most public places and higher institutions unlike cigarette. Information about the age of starting smokeless tobacco use could assist the tobacco control policy maker in focusing on the group at risk.

Table 4: **Determinants of Smokeless Tobacco Use by Multivariate Logistic Regression.**

Characteristics	Ever use	Never use	Odd ratio	CI	P value
<b>Age range</b>					
15-19	0	26	1.00		
20-29	22	448	0.49	0.31-0.78	0.002
30-39	57	616	1.12	0.79-1.60	0.518
40-49	20	365	0.58	0.35-0.94	0.024
50-59	30	140	2.89	1.86-4.48	<0.001
>60	12	40	3.81	1.90-7.23	<0.001
<b>Sex</b>					
Female	38	837	1.00		
Male	103	798	2.84	1.94-4.18	<0.001
<b>Education</b>					
None formal	13	183	1.00		
Primary	58	374	2.35	1.65-3.36	<0.001
Secondary	43	647	0.67	0.46-0.97	0.034
Tertiary	27	431	0.66	0.43-1.02	0.060
<b>Socioeconomic status</b>					
High	20	389	1.00		
Low	121	1246	1.89	1.16-3.07	0.009
<b>Tribes</b>					
Others (18 tribes)	32	923	1.00		
Margi	10	36	3.39	1.65-6.99	<0.001
Igbo	6	70	0.99	0.42-2.33	0.988
Bachama	6	96	0.71	0.31-1.66	0.429
Kilba	4	88	0.51	0.19-1.42	0.191
Hausa	23	112	2.65	1.63-4.31	<0.001
Fulani	60	310	3.17	2.22-4.52	<0.001
<b>Tobacco smoking</b>					
No	113	1134	1.00		
Yes	28	501	0.56	0.37-0.86	0.007
<b>Alcohol</b>					
No	99	1079	1.00		
Yes	42	556	0.82	0.57-1.20	0.309
<b>Total =1776</b>	<b>141</b>	<b>1635</b>			

The prevalence of snuffing of tobacco powder was 6.8 % and it was the commonest method of using smokeless tobacco, whereas in other studies chewing of tobacco was commonest method of smokeless tobacco use<sup>17, 26</sup>. More than ninety percent of the current smokeless tobacco users (93.2%) were mild to moderate (once to many times everyday) user of smokeless tobacco. With proper counseling and therapy the prospect to quit tobacco use is good in this category of tobacco user. Social acceptance was the most common reason for using smokeless tobacco followed by stress and pleasure; it was striking to note that peer pressure did not have significant contribution in this study unlike in tobacco smoking. Tobacco control programme need to focus more on socio-cultural societies based on the finding of social acceptance as a major reason for tobacco use. The average cost of buying smokeless tobacco product everyday was 25 ±10 naira (0.2 US dollars) which is one-fifth that of cigarette<sup>7</sup>. This study also revealed that 89.5% of the smokeless

tobacco users believed that smokeless tobacco was not harmful to their health. This opinion may be due to their local belief that, tobacco leaf has a medicinal value in curing some diseases and also because most tobacco education programs, were focusing more on the health hazard of tobacco smoking to the detriment of smokeless tobacco. Out of the 18% smokeless tobacco users advised to quit its use, only 7.5% tried quitting smokeless tobacco use. Those that tried quitting in our study were low when compared to 87.6% & 56.0% for tobacco smoking quitting attempt in South-West Nigeria and Kuwait respectively<sup>9, 25</sup>. The low tobacco counseling and quitting attempt in our study may be because of poor knowledge about the hazard of smokeless tobacco by the populace and tobacco cessation therapy by health workers. We also found that none of the 18 tobacco smokers in our study that attempted smoking cessation by using smokeless tobacco. Our study has shown a strong association between ever use of smokeless tobacco and independent determinants

like male gender, lower educational attainment and lower socioeconomic class. Our results was similar to reports from other studies on the smokeless tobacco<sup>21, 26-27</sup>. The ever use of smokeless tobacco also has strong association with subjects in 5th and 6th decade of life, Margi, Fulani and Hausa ethnic origin . The use of alcohol and tobacco smoking was not a significant determinant of smokeless tobacco in Nigeria adults' population. This non association with use of alcohol could be attributed to the religion of the region which prohibits the use of alcohol in what ever form. The non-association of tobacco smoking with smokeless tobacco could also be due to some differences in the factors promoting the use of smokeless tobacco. The banning of tobacco smoking in public places in Nigeria may encourage smokers to resort to smokeless tobacco to satisfy their nicotine addiction. Therefore this ban may lead to resurgence and increase snuffing and chewing of tobacco. This study also revealed that 89.5% believed that smokeless tobacco was not harmful to their health. Ignorance of dangers of smokeless tobacco use coupled with, inadequate intake of fruits and vegetables which are known to produce antioxidants that are protective to the body against malignant transformation of cells in the body tissue makes continuous use of smokeless tobacco dangerous in our society. Although the prevalence of smokeless tobacco use was low among Nigerian adult population in this study, the number of persons < 50 years using smokeless tobacco was high (74.4%) and the ignorance of dangers of smokeless tobacco was very significant. Therefore government and stakeholders need to draw up a comprehensive tobacco control policy that will discourage the use of not only cigarette smoking, but all forms of tobacco use.

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