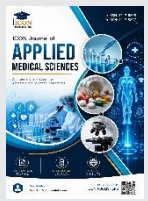

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Age and Gender Disparities in Cigarette Smoking Among Adolescents and Young Adults in Owerri Senatorial Zone, Nigeria: A Cross-Sectional Study

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Abstract

Cigarette smoking is still one of the major avoidable causes of morbidity and premature mortality worldwide. Adolescence and early adulthood are essential ages for the initiation of smoking because age and sex are important demographic factors of tobacco use. Tobacco control initiatives among teenagers can be focused by understanding age- and sex-specific smoking behaviours. This study investigated age and sex related prevalence of cigarette smoking among youths aged 12-20 years in Owerri Senatorial Zone, Imo State, Nigeria. A descriptive cross-sectional survey was conducted among 300 youngsters aged 12–20 years selected by multistage sampling technique. Data were obtained by use of a structured questionnaire derived from the World Health Organization Global Youth Tobacco Survey (GYTS). Current smoking status was categorised as current smoker or non-smoker. Data were summarised using descriptive statistics and correlations between smoking status and demographic characteristics were examined using Chi-square testing. Statistical significance was defined as $p < 0.05$. In all, 70 (23.3%) of the respondents were current smokers and 230 (76.7%) were non-smokers. The prevalence of smoking increased with age, from 15.0% among respondents aged 12–15 years to 22.0% among those aged 16–18 years and 33.0% among those aged 19–20 years. There was a statistically significant connection between age group and smoking status ($\chi 2 = 10.84$, $df = 2$, $p = 0.004$). Prevalence of smoking was likewise significantly greater in males (27.3%) than in females (18.5%). A significant correlation was found between sex and cigarette smoking ($\chi\ 2 = 4.21$, $df = 1$, $p = 0.040$) showing that male youths were more likely to smoke cigarettes than female youths. The cigarette smoking of the youngsters in Owerri Senatorial Zone showed considerable sex and age differences. The prevalence of smoking was significantly greater in older age groups and was much higher among male teens. These results underscore the need to prioritise older teens and young adult males as priority groups for tobacco prevention and cessation efforts. To reduce smoking initiation and promote healthier lifestyles among Nigerian youths, comprehensive interventions such as school and community-based health education, stricter enforcement of age restrictions on cigarette sales, peer-led behavioural interventions and gender-sensitive tobacco control strategies are recommended.

Keywords: *cigarette smoking, prevalence, age differences, gender differences, adolescents, youths, tobacco use, cross-sectional study, Nigeria.*

INTRODUCTION

Cigarette smoking continues to be one of the major preventable causes of illness, disability and premature death worldwide. According to the [1], tobacco use is responsible for over eight million fatalities yearly, with a considerable proportion of these attributed to direct cigarette smoking and exposure to second-hand smoke [2]. Although there have been significant advances in worldwide tobacco control, cigarette smoking remains a major public health concern particularly in adolescents and young adults who are at an important stage of behavioural and psychological development[3].

The main time during which cigarette smoking is introduced is adolescence and early adulthood. Data indicate that most adult smokers start smoking before age 18, and that starting smoking early significantly increases the risk of nicotine dependence, long-term tobacco use, and smoking-related diseases later in life [4]. During this period of development, young people are more likely to experiment with risky activities due to curiosity, peer influence, identity formation and increased social independence. Therefore, knowledge of the demographic variables related to smoking initiation is important for establishing successful tobacco prevention initiatives.

Cigarette smoking among children is determined by one of the most crucial factors, age. Studies have revealed an increase in the prevalence of smoking from early adolescent to late adolescence and young adulthood. This is due to growing independence, more peer influence, less parental monitoring and higher exposure to social contexts where tobacco use may be acceptable or supported among older teenagers. Older teenagers also have more disposable income and better access to cigarettes, therefore increasing the likelihood of smoking initiation and progression to regular tobacco use. Early smoking beginning is particularly concerning because it is linked to higher nicotine dependence, lower likelihood of successful cessation, and greater lifetime exposure to tobacco-related toxicants[5].

Sex differences are also relevant to cigarette smoking habit. Smoking rates worldwide tend to be greater in males than females, but the gender gap has been closing in several nations as social norms change and tobacco companies market their products to women . These disparities are due to biological, psychological, cultural and social factors. Male adolescents are more likely to be subjected to peer pressure, risk-taking behaviours and social circumstances that support smoking, while females may face greater social and cultural constraints on tobacco use, particularly in many African societies[6]. Yet, an increase in smoking among young women in some low-and middle-income countries has been noted with expanding urbanisation and changing social views, highlighting the importance of continuing monitoring of sex-specific smoking habits[7].

Global tobacco control programs notably the WHO Framework Convention on Tobacco Control (FCTC) have led to declines in tobacco use in many countries . However, cigarette smoking among teenagers is a developing problem in sub-Saharan Africa . Rapid urbanisation, aggressive tobacco marketing, increased exposure to social media, and weak enforcement of tobacco control legislation continue to enhance youth smoking beginning. The tobacco industry also increasingly targets younger groups through indirect advertising and promotional methods that portray smoking as socially desirable and fashionable.

Nigeria has one of the largest adolescent and teenage population in Africa and is undergoing fast demographic and social changes that may impact tobacco usage. While the National Tobacco Control Act and other tobacco control laws have been implemented, effective implementation and enforcement of these policies have been uneven. Adolescent smoking is influenced by peer interactions, parental smoking, availability of cigarettes, exposure to tobacco advertising and socio-economic status in previous Nigerian studies [8]. However, demographic variables such as age and sex are still key determinants of smoking behaviour and give useful information for identifying high-risk populations in need of focused interventions[9].

Understanding age and sex differences in cigarette smoking is vital, as age and sex affect not just smoking initiation but also smoking intensity, nicotine dependency, and tobacco control intervention effectiveness. Identifying groups with disproportionately high smoking prevalence enables policy makers and public health practitioners to develop age- and gender-appropriate prevention programmes, improve school- and community-based health education and strengthen enforcement of tobacco control regulations. This evidence further supports the aims of the WHO Framework Convention on Tobacco Control and the Sustainable Development Goals in tackling the health and economic burden of non-communicable illnesses[10].

Although there is growing concern about tobacco use among Nigerian youths, empirical research on age and sex specific smoking prevalence in many regions of the country is still lacking, especially in Owerri Senatorial Zone of Imo State. Most of the available studies have concentrated on overall smoking frequency or specific educational institutions with relatively few studies looking at demographic differences among adolescents and young adults in the broader community. Lack of local evidence makes it difficult to establish successful public health interventions that are suited to the peculiarities of the population.

The Owerri Senatorial Zone has urban, peri-urban and rural settlements with varied socio-economic and cultural circumstances which could impact smoking behaviour among the youth. The growing commercialisation, extensive peer interactions, increasing leisure activities and relatively easy access to tobacco products can put adolescent and young adult at a higher risk of smoking initiation. However, the pattern of cigarette smoking by age group and sex among youth inside the zone is not well understood[11].

Hence, this study was conducted to determine the age and sex related disparities in cigarette smoking among youths aged 12-20 years in Owerri Senatorial Zone, Imo State, Nigeria. Specifically, the study looked at the prevalence of cigarette smoking among the different age groups and male and female teenagers and whether there were any significant connections

between these demographic variables and smoking habit. The findings are likely to provide evidence for policy makers, public health practitioners, educators and other stakeholders to build targeted tobacco prevention and smoking cessation strategies for adolescents and young adults in Imo State and Nigeria as a whole.

MATERIALS AND METHODS

Study Area

The study was conducted in Owerri Senatorial Zone (Imo East), Imo State, South-East Nigeria. Owerri Senatorial Zone is one of the three senatorial districts in Imo State and comprises nine Local Government Areas (LGAs): Owerri Municipal, Owerri North, Owerri West, Mbaitoli, Ikeduru, Ngor-Okpala, Aboh Mbaise, Ahiazu Mbaise, and Ezinihitte Mbaise. The zone includes Owerri, the capital city of Imo State, which serves as the administrative, educational, commercial, and transportation hub of the state.

The study area is characterized by a mixture of urban, peri-urban, and rural communities. It hosts numerous secondary schools, tertiary institutions, markets, motor parks, recreational centres, and residential settlements where adolescents and young adults interact socially. These diverse socio-environmental settings provide varying levels of exposure to tobacco products and smoking-related social influences, making the area appropriate for investigating age- and gender-related differences in cigarette smoking.

The population is predominantly Igbo, with Christianity being the major religion. English and Igbo are the commonly spoken languages, while the major occupations include civil service, trading, transportation, farming, artisan work, and small-scale businesses.

Study Design

A descriptive cross-sectional study design was employed to determine age- and gender-related differences in cigarette smoking among adolescents and young adults aged 12–20 years in Owerri Senatorial Zone, Nigeria.

The cross-sectional design was considered appropriate because it permits the measurement of cigarette smoking prevalence and comparison across demographic groups at a single point in time. It also enables the assessment of associations between smoking status and socio-demographic characteristics such as age and gender.

Study Population

The study population comprised adolescents and young adults aged 12–20 years residing in Owerri Senatorial Zone during the study period. Both in-school and out-of-school youths were eligible for participation.

Inclusion Criteria

- Adolescents and young adults aged 12–20 years.
- Residents of Owerri Senatorial Zone for at least six months prior to the study.
- Individuals who voluntarily agreed to participate.
- For respondents below 18 years, parental or guardian consent and participant assent were obtained.

Exclusion Criteria

- Individuals younger than 12 years or older than 20 years.
- Non-residents of the study area.
- Eligible individuals who declined participation or returned incomplete questionnaires.

Sample Size Determination

A sample size of 300 respondents was used for the study. The sample size was considered adequate to estimate the prevalence of cigarette smoking and to compare smoking patterns across age groups and gender while ensuring sufficient statistical power and representativeness of the target population.

Sampling Technique

A multistage sampling technique was employed.

In the first stage, four Local Government Areas were selected from the nine LGAs constituting Owerri Senatorial Zone using simple random sampling.

In the second stage, three wards were randomly selected from each selected LGA.

In the third stage, three streets or enumeration areas were selected from each ward using simple random sampling.

In the fourth stage, households with eligible adolescents and young adults were identified through household listing, after which systematic random sampling was used to select households.

Where more than one eligible respondent resided in a selected household, one participant was selected using simple random sampling by balloting.

The final sample consisted of 300 respondents proportionately distributed across the selected sampling clusters.

Instrument for Data Collection

Data were collected using a structured questionnaire adapted from the World Health Organization Global Youth Tobacco Survey (GYTS). The questionnaire was modified to accommodate respondents aged 12–20 years and to include both in-school and out-of-school youths.

The questionnaire consisted of the following sections:

- Section A: Socio-demographic characteristics (age, sex, educational status, residence)
- Section B: Cigarette smoking status
- Section C: Frequency and pattern of cigarette smoking
- Section D: Exposure to second-hand smoke
- Section E: Accessibility of tobacco products
- Section F: Knowledge of the health effects of cigarette smoking

Validity of the Instrument

Content validity was established by adapting items from the WHO Global Youth Tobacco Survey, a standardized instrument that has undergone extensive international validation for assessing tobacco use among adolescents. The modified questionnaire was further reviewed by experts in Public Health, Epidemiology, and Medical Laboratory Science to ensure clarity, relevance, and suitability for the Nigerian context.

Reliability of the Instrument

A pilot study was conducted among adolescents and young adults in a community outside the study area. Internal consistency of the questionnaire was assessed using Cronbach's alpha coefficient. A Cronbach's alpha value of 0.70 or above was considered acceptable for the study.

Data Collection Procedure

Data were collected by trained research assistants using interviewer-administered and self-administered questionnaires depending on respondents' educational level.

Permission to conduct the study was obtained from relevant community leaders and school authorities where applicable. Written informed consent was obtained from respondents aged 18–20 years, while parental consent together with participant assent was obtained for respondents younger than 18 years.

Completed questionnaires were reviewed daily for completeness, consistency, and accuracy before data entry.

Ethical Considerations

Ethical approval was obtained from the Ministry of Health Research Ethics Committee before commencement of the study. Participation was voluntary, and respondents were informed of the objectives of the study before recruitment.

Confidentiality and anonymity were maintained by excluding personal identifiers from the questionnaires. Participants were informed of their right to withdraw from the study at any stage without any consequences. The study complied with the ethical principles of the Declaration of Helsinki governing research involving human participants.

Data Analysis

Data were entered, cleaned, and analyzed using Statistical Package for the Social Sciences (SPSS) version 25.0.

Descriptive statistics were used to summarize respondents' characteristics. Frequencies and percentages were calculated for categorical variables, while smoking prevalence was estimated according to age group and gender.

Inferential analysis was performed using the Pearson Chi-square test to determine the association between cigarette smoking and respondents' age group and gender. A p-value less than 0.05 was considered statistically significant.

RESULTS AND INTERPRETATION

Table 1: Distribution of Smoking by Age Group

Age Group	Smokers	Non-smokers	Total	Smoking Prevalence (%)
12–15 years	15	85	100	15.0
16–18 years	22	78	100	22.0
19–20 years	33	67	100	33.0
Total	70	230	300	23.3

Chi-Square Test
$\chi^2 = 10.84$
df = 2
p = 0.004

Table 1 shows the relationship between age group and smoking status. Smoking prevalence increased with age, with respondents aged 19–20 years recording the highest prevalence (33.0%), followed by those aged 16–18 years (22.0%), and while respondents aged 12–15 years recorded the lowest prevalence (15.0%).

Chi-square analysis revealed a statistically significant association between age group and smoking status ($\chi^2 = 10.84$, $p < 0.05$).

This implies that age significantly influences cigarette smoking among youths in the study area.

Table 2: Distribution of Smoking by Gender

Gender	Smokers	Non-smokers	Total	Smoking Prevalence (%)
Male	45	120	165	27.3
Female	25	110	135	18.5
Total	70	230	300	23.3

Chi-Square Test
$\chi^2 = 4.21$
df = 1
p = 0.040

The table 2 shows that smoking prevalence was higher among males (27.3%) compared to females (18.5%). The chi-square test indicated a statistically significant association between gender and smoking status ($\chi^2 = 4.21$, $p < 0.05$).

This suggests that male youths are significantly more likely to engage in cigarette smoking than female youths.

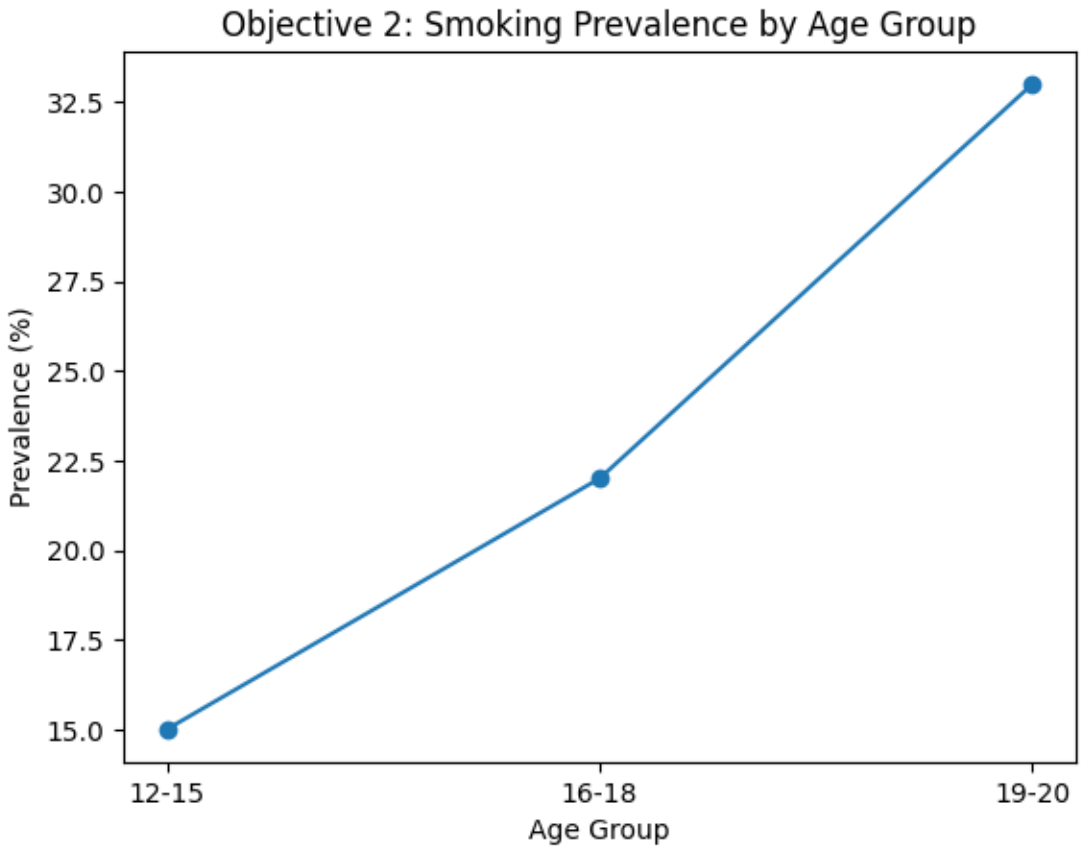

Figure 1: Smoking Prevalence by Age Group (Trend Chart)

The trend chart shows a progressive increase in smoking prevalence across age groups. Respondents aged 12–15 years recorded the lowest prevalence, while those aged 19–20 years recorded the highest prevalence. This suggests that cigarette smoking increases with age, possibly due to increased exposure, peer interaction, and social independence.

Discussion

This study investigated age and sex disparities in cigarette smoking among teenagers aged 12-20 years in Owerri Senatorial Zone, Imo State, Nigeria. The results indicated that cigarette smoking was substantially linked with age and sex. The prevalence of cigarette smoking increased with age and was considerably higher among male respondents than among female respondents[12] . These data imply that demographic variables play an essential role in the formation of smoking behaviour among adolescents and young adults.

There was a statistically significant connection between age and cigarette smoking, with the prevalence of smoking increasing from 15.0% among respondents aged 12 to 15 years to 22.0% among those aged 16 to 18 years and 33.0% among respondents aged 19 to 20 years ($\chi 2 = 10.84$, $p = 0.004$). The gradual increase suggests that the probability of cigarette smoking increases as teenagers approach late adolescence and early adulthood.

Developmental, behavioural and social aspects that come with growing age may explain the increase in smoking prevalence found with increasing age. Older teenagers and young adults are more likely to have higher autonomy, greater mobility, less parental supervision, and more extensive social interactions, all of which can increase exposure to smoking chances and peer pressures. "Also, older youth often have more disposable income and easier access to tobacco products, which makes experimentation and continued cigarette use more likely." The transition to young adulthood is also characterised by increased scholastic, occupational, and social pressures, which may lead some to engage in smoking as a perceived coping mechanism[13].

The strong connection between age and cigarette smoking found in this study is in line with prior worldwide and national findings. The U.S. Department of Health and Human Services indicated that cigarette smoking is most typically began in youth, with progression to regular smoking occurring primarily in late adolescence and early adulthood. Similarly, the World Health Organization stated that smoking prevalence usually increases with age during adolescence due to cumulative exposure to peer influence, tobacco marketing and other environmental risk factors[14].

The present findings also compare to those published by [15] in Nigeria where they discovered that older adolescents were substantially more likely to smoke than younger adolescents. The investigators attributed this age gradient to rising independence, more involvement in social activities, metropolitan lives and stronger peer effects. These trends have been recorded in various low and middle-income countries, confirming that rising age is a persistent major predictor of cigarette smoking among youth[16].

The study also found a statistically significant association between sex and cigarette smoking. The prevalence of smoking was 27.3% in male respondents and 18.5% in female respondents ($\chi^2 = 4.21$, $p = 0.040$). This research shows that male kids in the study area were more than a hundred times more likely to have cigarette smoking than females. The greater incidence of cigarette smoking in males may be due to prevalent socio-cultural norms and behavioural variances. Culturally, smoking among males is often more socially allowed in many African communities, whereas smoking among females is often prohibited due to social shame. Young males are also more likely to participate in sensation seeking and other risky activities, which increases the odds of trying tobacco products. Moreover, guys frequently have more freedom to move around and to socialise, resulting in increased exposure to smoking peers and more cigarette-friendly situations.

Findings of this study are in agreement with [17] who indicated that in most parts of the world the prevalence of smoking among male teenagers is consistently greater than that of girls. Similarly, it was found that in Nigeria, male teenagers were considerably more likely to smoke cigarettes and engage in other substance use behaviours than girls. These parallels show that gender gaps in tobacco use are still present despite current tobacco control efforts.

The lower prevalence of smoking among females was noted; yet, a striking finding was that almost 1 in 5 female respondents acknowledged cigarette smoking. This shows that cigarette smoking is no longer a male exclusive activity and may be a reflection of changing social norms, increasing urbanisation, increased exposure to social media and developing gender roles among the Nigerian young. Concern is raised by the increased engagement of female adolescents in smoking behaviour and if interventions are not strengthened, it could lead to the future increase of tobacco linked diseases in women [18].

The combined effect of age and sex as reported in this study has substantial implications for public health. Older teenage and young adult males seem to be the demographic groups most at risk for cigarette smoking and should therefore be the priority of tobacco control initiatives[19]. However, the presence of cigarette smoking among female teens also underscores the necessity for inclusive interventions targeting both sexes. Tobacco prevention strategies should be age specific and gender sensitive and should include school-based health education, peer-led behavioural interventions, community

awareness campaigns, parental engagement and strict enforcement of legislation prohibiting the sale of tobacco products to minors[20].

Conclusion:

The result shows that there is a considerable difference in cigarette smoking among youths in Owerri Senatorial Zone by age and sex. The gradual increase in smoking prevalence with age and the higher incidence among males all point to the significance of early prevention efforts before smoking practices become established. Thus, there is a need for evidence-based tobacco control policies that consider demographic disparities in lowering smoking initiation, preventing nicotine dependency and minimising the long-term burden of tobacco-related diseases among Nigerian adolescents and young adults.

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