# Exploring In-School Adolescent Smoking Behaviors: A Comparative Study of Rural and Urban Contexts in Anambra, Nigeria

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**ABSTRACT:** The use of tobacco among adolescents is a big public health issue in low- and middle-income countries of the world including Nigeria. The aim of this study was to compare prevalence anddeterminants of tobacco use among in-school adolescents' resident in urban and rural secondaryschools in Anambra State. A cross-sectional analytical design was observed using multi stage random sampling to sample 360 students from some selected schools. A pretested, semi structured questionnaire adapted from the Global School Health Survey (GSHS) was used to collect data. The data was analyzed by descriptive and inferential statistics. Similar prevalenceof tobacco use was found in both the urban (6.3%) and in the rural (6.5%) sites, without significance in either (p=1.000). Participation in protective factors including health education programs in which participants are educated on smoking dangers and sexually transmitted diseases (STDs) in particular was associated with non-smoking behavior significantly more inurban areas. On the other hand, being urban adolescents who reported tobacco use showed significantly association with risk factors such as poor school environment and bullying. Consequently, no difference in rates of tobacco use occur between urban and rural adolescents,despite differences in protective and risk factors. Recommendations aimed at strengthening health education, and improving school environments and reducing bullying are suggested to reduce adolescent smoking in these settings. Effective tobacco control of Nigerian adolescentsrequires targeting of public health interventions on the basis of the socio-cultural context.

**KEYWORDS**: In-school Adolescents, Tobacco use, Urban-rural comparison, Health education, Risk factors, Adolescent smoking

Tobacco uses globally and especially in Anambra state Nigeria is great a public health risk to youth because of the complex mix of economy. Given the dynamic and increasing growth rateof the demographic, it is important to examine the risk and protective factors for tobacco use among adolescents. The urgency is heightened, however, by the fact that smoking prevalence is also on the rise among students, which damages their health and has wide social implications(Akinpelu 2015). Furthermore, tobacco usage has been highlighted as the leading preventablecause of death on a global basis, according to the World Health Organization (Samet, 2013). While early smoking has been observed to greatly raise the odds that a person will become dependent on tobacco and suffer from health-related issues throughout their life. Research intosocial factors such as peer pressure, SES and cultural factors in relation to adolescent smokingin Nigeria has shown that the fight against tobacco is exceptionally difficult (Egbe et al., 2014).The intent of this study is to explore social factors that influence adolescents' perception of tobacco smoking and patterns same across rural and urban communities in Anambra State. It therefore also tries to develop strategies which will reduce smoking prevalence and encouragehealthier decision making among youth. Therefore, tobacco control for this population goes farbeyond protecting individual health, and instead serves to build a healthier society for future generations.

Importantly, this research looks into factors that influence the tobacco use for Anambra State adolescents across different geographical locations. How previous investigations have generally focused on adult tobacco smoking, and rarely analyzed the relative impacts of urbanversus rural environments in teen smoking, is the next point. This study therefore attempts to fill the deficiency by using an extensive quantitative method to investigate factors thatinfluence tobacco use among in school adolescents. This research aims to provide insight on the challenges of adolescent tobacco use in various environments adding new literature to the existing knowledge on the topic. Findings are anticipated to inform public health strategies andinterventions that take account of sociocultural context of Anambra State. The theoretical foundation of this study draws on two key

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frameworks: Ecological model of health behavior and Social Learning Theory. Like Social Learning Theory, suggested by Albert Bandura, individuals learn behaviors by observation and imitation particularly in social environment. One of the important teachings of this theory is then about how the peer interactions, the familyrelationships, and the cultural norms in this influenced the behaviour (Rumjaun & Narod, 2020). On the other hand, the Ecological Model of Health Behavior presents a general view of behavior related to health by indicating that actions like smoking are determined by interactionsbetween different levels — individual, interpersonal, community and societal (Richard et al., 2011). Using these frameworks, this study integrates to examine how peer dynamics, family influences and community resources influence adolescent smoking behaviour in both rural andurban environments.

In addition to guiding the analysis of the data, this conceptual framework highlights the role ofcontextual factors (in this case socio economic status, cultural attitudes and access to smokingcessation resources) in explaining patterns in health behaviors. An appreciation of these complexities generates research that makes a meaningful contribution to the understanding ofadolescent smoking and the development of targeted interventions that attend to the characteristically social and environmental contexts in which these behaviors occur.

Finally, this study seeks to evaluate the effects of rural-urban differences on protective and riskfactors among in school adolescents' tobacco use in Anambra State, Nigeria. The goals are to assess the prevalence of smoking, determine protective factors for smoking, identify risk factors for smoking, and provide evidence-based recommendations for targeted interventions.This study hopes to contribute to the creation of public health strategies that will promote healthier lifestyle among Nigerian youth.

**METHODOLOGY**

**Study Design:**

This was a comparative cross-sectional analytical study aimed at determining the protective and risk factors for tobacco smoking among in-school adolescents in rural and urban secondaryschools in Anambra State.

**Setting:**

The study was conducted in rural and urban secondary schools across different local government areas (LGAs) of Anambra State, Southeastern Nigeria. Anambra State consists ofboth rural (14 LGAs) and urban (7 LGAs) areas, each with distinct socioeconomic and educational environments that influence health behaviors.

*Study Population:*

- **Study Population:** In-school adolescents aged 10-19 years enrolled in secondaryschools in the selected rural and urban areas.

- **Inclusion Criteria:** Adolescents enrolled for at least one year and whose parentsprovided consent.

- **Exclusion Criteria:** Adolescents absent during data collection, unable to provideconsent, or with mental health issues.

**Sample Size:**

A sample size of at least 336 students (168 from rural and 168 from urban schools) was calculated, using a formula for comparing proportions of health behaviors between groups. Using power of 90%, significance level of 0.05, prevalence of 26.6% from previous study in Nigeria, prevalence difference of 12.9%, and response rate of 90%, the minimum sample sizecalculated was 168 students per group after adjustments were made for non-responses**.**

**Sampling Strategy:** Multi-stage sampling was used:

- **Stage 1: Selection of local government areas**

Anambra State consists of 21 LGAs; stratified into 14 rural and 7 urban LGAs (ratio 2:1). Two LGAs from the rural stratum one from the urban stratum were selected by simple random sampling resulting in a total of 3 LGAs.

- **Stage 2: Selection of schools**

Schools were selected by stratified random sampling from the previously selected LGAS. This was from a sub-sampling frame consisting of all schools with JSS2- SS3 classes in the previously selected LGAs with attention to achieve equal representation of the boy's exclusive, girl's exclusive and co-educational strata. The sub-stratum of selection was the type of school; exclusive and co-educational and by equal allocationone school was selected from each of the three strata. In each stratum, the school was selected by simple random sampling. The list of schools in each stratum as provided bythe State Ministry of Education formed the sampling frame. This resulted in the selection of 3 secondary schools per LGA and therefore a total of 9 secondary schools.

- **Stage 3: Selection of classes**

The sampling frame of this stage consisted of all JSS2 to SS3 classes in the selected schools. Therefore, this stage involved the random selection of a classroom using simple random sampling from each class level in the selected schools where there are multiple class arms. This resulted in the selection of 5 classrooms per school and therefore a total of 45 classrooms; 30 classrooms in rural and 15 classrooms in urban secondary schools.

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- **Stage 4: Selection of students**

The selected classrooms served as the primary sampling units. Systematic random sampling was used to select 6 and 12 (minimum sample size divided by the total numberof classrooms per sub-population; Rural=168/30 = 5.6, Urban= 168/15= 11.2) studentsfrom each of the sampled classes in the rural and urban selected schools respectively since the national average of students per class was reported to be 68 students for juniorsecondary classes and 62 for senior secondary classes; this was lower in Anambra statewith the average figure as 48. In the rare instance that a selected class was found to have less than 8 students, an additional class arm was selected by simple random sampling. However, the first student in each class was randomly selected from the classattendance register using the simple random sampling technique. Then the sampling interval, was determined by dividing the number of students in each class by the required number of students from each class. Ultimately, this yielded a sample size of360 students; 180 students each from the rural and urban secondary schools.

**Data Collection:**

- **Data Collection Tools:** A pre-tested, semi-structured, self-administered questionnaireadapted from the Global School Health Survey (GSHS) was used to collect data on sociodemographic characteristics, tobacco use, protective and risk factors.
- **Validity:** The GSHS tool, validated in similar contexts, was adapted with localexamples.
- **Data Collection Process:** Questionnaires were distributed to consenting students in classrooms, and research assistants collected completed forms. Physical measurements(height, weight) were taken using standardized procedures to assess BMI.

**Data Analysis:**

- **Data Entry:** Data was entered using IBM SPSS (version 23.0). Double entry was performed to ensure accuracy.
- **Analysis:** Descriptive statistics, chi-square tests, and binary logistic regression were used to identify the association between protective/risk factors and tobacco use. The significance level was set at $p < 0.05$.

**Ethical Considerations:**

Ethical approval was secured from the Nnamdi Azikiwe University Teaching Hospital Ethics Committee (NAUTHEC). Approval was secured from the Ministry of Education and the principals of the chosen schools. Informed consent was secured from the students following acomprehensive explanation of the study's objectives, procedures, associated risks, potential benefits, and their right to withdraw from the study at any time without repercussions. Informedconsent was obtained from the principals of the selected schools, serving as the legal guardiansof the students. All information was handled with confidentiality.

## RESULTS

A total of 360 students participated in the study, with a response rate of 95%. The demographiccharacteristics of the participants were analyzed, revealing a diverse sample in terms of age, gender, and socioeconomic status.

**Table 1: Socio-demographic characteristics of study population.**

| Variable | Urban(n=176) N (%) | Rural(n=168) N (%) | Total(n=344) | $\chi^2$ | p-value |
|---|---|---|---|---|---|
| **Gender** | | | | | |
| **Male** | 67(38.1) | 97(57.7) | 164 | 13.331 | *0.000 |
| **Female** | 109(61.9) | 71(42.3) | 180 | | |
| **Marital status** | | | | | |
| **Married** | 0(0.0) | 0(0.0) | 0(0.0) | | |
| **Single** | 176(100.0) | 168(100.0) | 344(100.0) | | |
| **Religion** | | | | | |
| **Christianity** | 175(99.4) | 168(100.0) | 343 | 0.957 | 1 |
| **Islam** | 1(0.6) | 0(0.0) | 1 | | |
| **Tribe** | | | | | |
| **Igbo** | 172(97.7) | 168(98.2) | 337 | 0.96 | 0.619 |
| **Hausa** | 1(0.6) | 0(0.0) | 1 | | |
| **Yoruba** | 3(1.7) | 3(1.8) | 6 | | |
| **Family structure** | | | | | |

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| | | | | | |
|---|---|---|---|---|---|
| **Monogamous** | 165(93.8) | 142(85.0) | 307 | 6.936 | *0.013 |
| **Polygamous** | 11(6.3) | 25(15.0) | 36 | | |
| **Guardians** | | | | | |
| **Both parents** | 152(86.4) | 124(73.8) | 276 | 11.35 | *0.023 |
| **Father alone** | 0(0.0) | 1(0.6) | 1 | | |
| **Mother alone** | 21(11.9) | 31(18.5) | 52 | | |
| **Other** | 3(1.7) | 12(7.1) | 15 | | |
| **Class** | | | | | |
| **JSS2** | 36(20.5) | 33(19.6) | 69 | 0.104 | 0.999 |
| **JSS3** | 36(20.5) | 33(19.6) | 69 | | |
| **SS1** | 34(19.3) | 34(20.2) | 67 | | |
| **SS2** | 35(19.9) | 35(20.8) | 69 | | |
| **SS3** | 35(19.9) | 35(20.8) | 70 | | |

*Statistically significant, p<0.05

** Pearson Chi-square used. Statistically significant, p<0.05

This research examined the socio-demographic attributes of 344 individuals, categorized into urban (n=176) and rural (n=168) groups. The gender distribution revealed a statistically significant disparity, with a higher proportion of females in urban regions (61.9%) and a greaterproportion of males in rural regions (57.7%) (p=0.000). All participants were unmarried, and Christianity was the prevailing religion (99.4% in urban areas, 100% in rural areas). The Igboethnicity had a significant majority in both groups (97.7% urban, 98.2% rural).

The family structure exhibited considerable variation, with a greater percentage of monogamous households in urban regions (93.8%) than in rural regions (85.0%) (p=0.013). Guardianship patterns shown notable disparities, with a higher percentage of individuals residing with both parents in urban regions (86.4%) than in rural regions (73.8%) (p=0.023). Educational attainment was uniformly distributed between urban and rural populations, with no major disparities.

**Prevalence of Tobacco Use**

**Table 2: Prevalence of Tobacco Use Among Adolescents in Urban and Rural Secondary Schools**

| Location | Number of Respondents | Tobacco Users | Prevalence (%) |
|---|---|---|---|
| **Urban** | 175 | 11 | 6.3 |
| **Rural** | 168 | 11 | 6.5 |
| **Total** | 343 | 22 | 6.4 |

- The study found that the majority of respondents reported no cigarette or tobacco use, with 93.7% in urban and 93.5% in rural secondary schools. This indicates a slightly higher prevalence of tobacco use among rural adolescents (6.3%) compared to urban adolescents (6.5%).

**Comparison of Tobacco Smoking Prevalence**

**Table 3: Comparison of Tobacco Smoking Prevalence Between Urban and Rural Adolescents**

| Location | Tobacco Users | Prevalence (%) | Chi-Square ($\chi^2$) | p-value |
|---|---|---|---|---|
| **Urban** | 11 | 6.3 | 0.010 | 1.000 |
| **Rural** | 11 | 6.5 | - | - |

Table 3 outlines the prevalence of tobacco smoking among urban and rural adolescents. Both demographics exhibit 11 tobacco users, yielding a prevalence rate of 6.3% in urban settings and 6.5% in rural settings. The chi-square test statistic is 0.010, with a p-value of 1.000, signifying no statistically significant disparity in smoking prevalence between the two cohorts.

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**Association with Protective Factors**

**Table 4: Association Between Protective Factors and Prevalence of Tobacco Smoking**

| Protective Factor | Location | No Tobacco Use | Chi-Square $(\chi^2)$ | p-value |
|---|---|---|---|---|
| **Classes on Smoking Dangers** | Urban | 147 (96.7%) | 28.104 | 0.000 |
| | Rural | 133 (95.7%) | 5.323 | 0.036 |
| **Classes on Avoiding STDs** | Urban | 150 (96.8%) | 21.557 | 0.000 |
| | Rural | 140 (95.2%) | 6.129 | 0.034 |
| **Classes in Injury Prevention** | Urban | 144 (98.0%) | 28.104 | 0.000 |
| | Rural | 130 (95.6%) | 5.323 | 0.036 |

Table 4 presents a summary of the relationships between different protective variables and the prevalence of tobacco use among in-school adolescents in both urban and rural settings.

In urban areas, 96.7% of in-school adolescents who participated in educational sessions about the hazards of smoking reported no tobacco use. The chi-square statistic of 28.104 and a p- value of 0.000 demonstrate a highly significant association between class attendance and no tobacco use. In rural regions, 95.7% of in-school adolescents were non-smokers, with a chi- square statistic of 5.323 and a p-value of 0.036, indicating a substantial link, but less prominent than in urban areas.

Among urban in-school adolescents, 96.8% of participants who attended classes on preventing sexually transmitted diseases (STDs) were found to be non-smokers, with a chi-square value of 21.557 and a p-value of 0.000, signifying a robust correlation between these classes and the absence of tobacco use. In rural regions, 95.2% of in-school adolescents participating in these classes were non-smokers, with a chi-square statistic of 6.129 and a p-value of 0.034, indicating a significant protective impact.

Also, 98.0% of urban in-school adolescents who had participated in injury prevention programs were found to be non-smokers, evidenced by a chi-square value of 28.104 and a p-value of 0.000, indicating a robust correlation with non-smoking behaviour. In rural regions, 95.6% of adolescents were non-smokers, with a chi-square statistic of 5.323 and a p-value of 0.036, indicating a significant albeit modest protective impact.

In conclusion, all three protective factors—education on smoking hazards, STD prevention, and injury mitigation—are significantly correlated with reduced tobacco consumption among in-school adolescents with the effects being especially pronounced in urban settings.

**Role of Risk Factors**

**Table 5: Role of Risk Factors in Influencing Tobacco Smoking Among Adolescents**

| Risk Factor | Location | Tobacco Users | Chi-Square $(\chi^2)$ | p-value |
|---|---|---|---|---|
| **Poor School Environment** | Urban | 3 (100.0%) | 7.026 | 0.027 |
| | Rural | 1 (100.0%) | 14.358 | 0.065 |
| **Bullying** | Urban | 6 (100.0%) | 4.579 | 0.045 |
| | Rural | - | - | - |
| **Alienation** | Urban | 3 (60.0%) | 25.21 | 0.002 |
| | Rural | - | - | - |

Table 5 illustrates the association between diverse risk factor and tobacco smoking among in-school adolescents in both urban and rural areas.

In urban settings, three in-school adolescents subjected to a poor school environment admitted tobacco use with $\chi^2$=7.026, p-value =0.027 indicating a statistically significant correlation between a poor school environment and tobacco consumption. In rural areas,

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the sole in-schooladolescent subjected to this risk factor was also a tobacco user, with $\chi^2= 14.358$ and p-value =0.065, signifying a non-significant trend. All of the six urban in-school adolescents who encountered bullying admitted tobacco use. The chi-square test produced a value of 4.579 anda p-value of 0.045, signifying a significant correlation between bullying and tobacco consumption. In urban regions, 60% of adolescents who expressed feelings of alienation admitted to tobacco smoking. The chi-square statistic was 25.21, with a p-value of 0.002, indicating a statistically significant association between alienation and tobacco consumption especially inurban schools.

## DISCUSSION

### Prevalence of smoking amongst in-school adolescents

Firstly, this cross-sectional study on in-school adolescents in Anambra state showed a marginally higher prevalence of tobacco use in rural areas than in urban areas. It opens an areaof research and discussion, not only in an area that connects to existing research and global practices but also one that is more nuanced against a background of global practices and Nigerian and more specifically the African context. Previous research have highlighted similartrends in which adolescents from rural areas report higher rates of smoking. For instance, in many African countries, studies have indicated that rural adolescents tend to have high rates ofusage because tobacco products are more accessible and socially acceptable (Vishnoi et al., 2019; Skvortcova & Lushkina, 2018; Khan et al., 2014). Often tied to lower levels of health education, fewer cessation resources, and cultural norms that legitimize tobacco use, this trendis often associated with.

Contrarily, urban areas tend to enjoy more strict regulations, public health campaigns, and easyaccess to health services, which can consequently reduce the prevalence rates (Shahbabu et al.,2020; Shettler, 2005). It is important to compare this study's findings with other research and methodologies used. However, although many of the studies use self-reported surveys to measure tobacco use, and there is a known social desirability bias leading to underreporting, the cross-sectional design of this Anambra study does offer a more recent snapshot of localizedtrends. Moreover, socioeconomic factors may also help explain the rural/urban divide in tobacco use with rural adolescents possibly subject to higher levels of stress resulting from poverty and unemployment, thus embracing tobacco as a coping mechanism (Khan et al., 2014).

This study adds to the previous studies and finds alignment with the larger trend of increased tobacco use in rural areas, but it also demonstrates a necessity for localized interventions. Recent research in Nigeria has primarily focused on urban populations, overlooking the significant challenges faced by rural adolescents. Assuming this gap in research, some of thesedisparities may contribute to the variation in the use and enforcement of tobacco control policies in different settings (Oyewole et al., 2018; Itanyi et al., 2018; Odukoya et al., 2016; Nwafor et al., 2012; Adejuwon, 2009).Although tobacco control policies more and more recognize the need to address rural populations globally, seldom are rural populations addressed, and implementation often lags behind urban initiatives. Given the continued high prevalence of tobacco use in Africa (where it is a major public health concern) there is a needfor tailored interventions that take into account the sociocultural context of rural communities.Although, laws prohibiting tobacco control have been made in Nigeria, the enforcement in ruralareas is widely inconsistent. The meat of the study points out how public health strategies targeted at increasing awareness and offering easy access to tobacco cessation and preventionresources in rural schools are necessary (Lasebikan & Ola, 2016; Egbe et al., 2013; Drope, 2012).Tobacco use is more common in rural adolescents in Anambra and the findings thus highlight the complexities surrounding the tobacco consumption patterns of youths in differentgeographical and socioeconomic context. Both policies and practices must be reimagined to be inclusive and effective in various geographies. This study highlights insights that can be integrated with earlier research to help policymakers and stakeholders know how to think aboutthe reasons some adolescents use tobacco and this can inform effective strategies to prevent tobacco use in all adolescents, wherever they live.

### Difference between urban and rural prevalence rates of smoking amongst in-school adolescents

However, despite finding little difference in prevalence of smoking between urban and rural adolescents, this study contributes to a larger need to further explore the possible implicationsof this result. However, studies have traditionally found that urban settings have higher smoking rates as compared to rural areas, e.g. due to increased exposure to tobacco advertising,stronger peer influences and easier access to tobacco products (Kaufman et al., 2010). An example is that global research demonstrates consistently that adolescents in urban areas are far more prone to smoke than their rural counterparts (Mendes et al., 2018; Jiang et al., 2016).Notwithstanding this conventional narrative about smoking behaviour, however, the findings of this study contradict this by showing that determinants of smoking behaviour are not necessarily what has been previously understood in the Nigerian context.

The World Health Organization (WHO) has felt it is important to develop interventions tailoredto address the shared and specific urban and rural adolescents' challenges (Tilley et al., 2014).This finding is in accord with that of other African countries where the gap between urban andrural smoking prevalence is closing, consistent with emerging research on the subject. The diffusion of cultural norms or widespread reach of tobacco marketing to urban and rural areas(Njoumemi et al., 2020; Shahbabu et al., 2020)

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explains this trend.

Studies from Africa have in the past, however, documented large differences in smoking rates between the urban and the rural areas for adolescents. For example, research in South Africa and Kenya has evidenced that urban youth smoke at higher prevalences, at least in part to socioeconomic and lifestyle disparities (Peltzer, 2011; Lau et al., 2018; Peer et al., 2013). Nevertheless, the Anambra findings here are characteristic of a potential alteration in smoking conduct, as rural adolescents might be enrolling in similar rates of smoking than their urban peers. For instance, globalization could bring on this shift along with other factors including peer pressure and easy availability of tobacco products in rural areas.

The implementation of the National Tobacco Control Act and priority public health measures to stimulate a sharp decline in youth smoking in Nigeria has not resulted in a marked difference in smoking prevalence between urban and rural adolescent populations, which may indicate the need for a reconsideration of government policies. The results suggest important questions about current strategies and whether they take adequate account of changing adolescent smoking behaviors across distinct geographic areas over time.

This study is subjected to a critical analysis of for these are some key insights when compared with previous research. This study used robust methodologies, unlikely to produce more biased insights into adolescent smoking patterns as opposed to the majority of past studies that relied on self-reported data. This divergence in findings could be due to methodological rigor, differences in data collection techniques accounting for earlier studies overestimating the urban rural divide.

In addition, socio cultural dynamics in Nigeria may have contributed to the normalization of smoking in some communities, the force of social networks, which both reinforce and undermine normative expectations of when and where smoking will be allowed, also plays an important part in shaping smoking behaviors. This study also reveals that smoking is becoming accepted more and more amongst adolescents, whether they are in urban or rural areas, and in doing so may have missed by previous research (Egbe et al., 2014; Ojo et al., 2009).

Finally, the lack of a statistical difference of smoking prevalence among urban and rural adolescents is an important shift in our knowledge of adolescent smoking behaviors. In this study, the authors add to the growing literature that question the belief that the urban-rural divide in smoking exists. This study adds to the growing body of literature that challenges traditional assumptions about the urban-rural divide in smoking. This clearly highlights the

need on the part of targeted public health interventions to reflect on the changing socio-cultural landscape that characterizes adolescents smoking practices within urban as well as rural environments and the main force drivers behind their smoking behavior. The trends identified in future research should continue to be explored in order to inform more effective tobacco control strategies in Nigeria and elsewhere.

**Protective factors against smoking in in-school adolescents**

This study demonstrates a statistically significant association between participation in educational classes aimed at overcoming tobacco use and STDs as well as injury prevention and lower tobacco use incidence among the adolescents. Its outcome illustrates the key role targeted educational interventions have for changing healthy behaviors of young people in urban or rural settings as seen in diverse studies (Przybylska et al., 2014).

In health education generally, the results have shown that comprehensive health education reduces the rates of smoking among adolescents. For example, school-based tobacco prevention programs in the United States have been observed to significantly reduce the number of students initiating smoking (Wolfenden et al., 2014). Similarly, in Africa, research in Kenya and South Africa have equally elucidated how health education programs reduce tobacco use among youth (Nishio et al., 2018).

Findings from this study fit nicely with the extant Nigerian and global literature on how health education can influence adolescent behavior. Nigerian adolescents have been shown previously to have high rates of tobacco use that's similarly sparked by a relative lack of awareness about the risks to their health (Adeoye et al., 2018). The current study adds to the evidence base in support of educational interventions as recommended by Nigeria government as the first step in its comprehensive strategy by introducing health education into the school curricula as a way to combat tobacco use and promote all around health (Raji, 2014).

A more detailed review of the cited studies reveals both commonality and difference in the results. While many studies show a role for health education in reducing the use of tobacco, there are significant differences in how these educational efforts are delivered. Some programs have a peer focus, although some are led by the teachers or employ multimedia (Wolfenden et al., 2014). It might be that the significant results observed in this study are explained by the structured curriculum which addresses multiple health issues concurrently.

Variations in outcomes are also a function of variations in cultural contexts and regional differences in tobacco use prevalence. For instance, in the case of urban adolescents versus rural adolescents, the levels of tobacco marketing exposures or social pressure would themselves determine whether they are likely to smoke or not. The findings of this study propose that culturally and geographically contextual interventions are necessary to optimize effectiveness among diverse populations.

The findings add further importance to education in inciting healthy habits among adolescents, as the strong association between

attendance in health education classes and reduce tobacco use confirm. It also contributes to broader discussion of public health strategies in Nigeria andin contexts such as it. This study can also have future relevance in informing recommended policies and practice to increase the odds of reducing tobacco usage and promoting a healthiergeneration of adolescents.

**Risk factors for smoking amongst in-school adolescents**

This study provides important insights into the factors driving adolescent tobacco use while highlighting the role of living the urban and rural environment in the adoption of this health behaviour. The strong finding here is that a poor school environment is a major risk factor fortobacco use. This fits with growing literature on the role of educational settings in adolescent behavior. Poorly maintained, under resourced and limited support structures schools can poseto promote risk taking behaviours such as tobacco use. As life in cities increases the pressureand distractions of living in the city, these vulnerabilities (Nolan et al., 2015) may be more pronounced.

The results of this study also elucidate the psychological and social factors involved in smoking, particularly the part played by bullying and alienation. Patterns consistent with previous research on bullying victims' mental health challenges are seen: Adolescents who experience bullying have been seen to turn to tobacco as a way to cope. As in urban schools, where student populations are often larger, more diverse, by the time social dynamics becomemore complex, the effects of bullying can be exacerbated (Kim et al., 2020).

This study's findings, corresponding with the existing research, are particularly consistent withresearch in North America and Europe, where relationships between school climate and substance use have been extensively studied. School environment interventions like increasingstudent teacher relationships, reducing pupils bullying, and mental health services have been found to reduce adolescents' use of all substances (including tobacco), including smoking (Benningfield et al., 2015; Kokkevi et al., 2007). Despite increased awareness of the socio- environmental factors that shape adolescent behavior in the African context, more site-specificwork is required to explain how the culture and socio-economic milieu of specific areas structures youth experiences (Mbuthia, 2014). It is in Nigeria where poor school environmentsand the rampant bullying are only overlaid upon systemic challenges like inadequate educational funding and a lack of access to mental health service. Our findings correspond withwhat the literature has been calling for—comprehensive policy interventions that promote safer, more supportive school environments. Examples could be anti-bullying programmes, mental health services and health promoting schools (Bonell et al., 2019; Nickerson, 2019).

Here, the methodologies used in this study are critically analyzed, compared to previous research; strengths and limitations are identified. The cross-sectional design permits distinctionbetween associations of variables but may not capture effects of school environment and

bullying on tobacco use over time. More robust evidence of causal relationship has been provided through longitudinal studies, and future research can be benefited by taking longitudinal design. Furthermore, variations in findings, may be due to the demographic and cultural contexts of the adolescents in this study as compared to other regions.

The results presented in this study suggest that school environments and the social dynamics surrounding them may play a critical role in determining adolescent smoking behavior and takeon a multidimensional nature to the problem of adolescent tobacco use. The insights provide knowledge on adolescent health for the broader body of knowledge and highlight the urgent need for targeted interventions on these risk factors. Creating healthier, more supportive schoolenvironments to foster the well-being of youth should be the major focus of policies in Nigeriaand other countries where systemic challenges are still prominent.

**CONCLUSION**

This study provides valuable insights into the patterns of tobacco use among in-schooladolescents in Anambra State, revealing key differences between rural and urban populations.The prevalence of tobacco use was slightly higher among rural adolescents, though the difference was not statistically significant. However, the identification of risk factors such as poor school environments and bullying, particularly in urban settings, underscores the need fortargeted interventions. Protective factors, notably the inclusion of health education on smokingdangers, were significantly associated with reduced tobacco use. These findings highlight the importance of strengthening school environments, improving access to health education, and addressing bullying to mitigate tobacco use among adolescents. Tailored public health strategies should prioritize creating supportive educational settings in both urban and rural areas. We recommend the implementation of comprehensive school-based tobacco preventionprograms, focusing on health education and anti-bullying initiatives. Additionally, policymakers should consider expanding tobacco cessation resources in rural areas where access is limited. Further research could explore the long-term effectiveness of theseinterventions to reduce adolescent smoking rates and promote healthier behaviors.

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