Assessment of Knowledge, Attitude and Practice of Tobacco Smoking Among Pupils: A Case Study of Kalomo Secondary School in Kalomo District Southern Province, Zambia

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Abstract

Tobacco smoking is one of the leading preventable causes of illness and death worldwide. Its prevalence continues to rise in many low- and middle-income countries, including Zambia. This study aimed to assess the knowledge, attitudes, and practices regarding tobacco smoking among pupils aged 14–20 years at Kalomo Secondary School in Kalomo District, Southern Province, Zambia. A descriptive cross-sectional study design was used, involving 273 pupils who were selected using simple random sampling. Data were collected using a structured questionnaire and analyzed with SPSS version 25. Descriptive statistics were used to summarize key findings, while chi-square tests were applied to determine the relationship between knowledge, attitudes, practices, and smoking behavior. The data collection tools were piloted at Zimba Secondary School, and ethical approval was obtained prior to the study. The study revealed that most pupils had limited knowledge about the harmful effects of smoking. While 51% knew that smoking could cause heart disease, stroke, and impotence, only 26% linked it to lung diseases. Additionally, 13% of the respondents disagreed, and 10% were unsure about the health risks of smoking. Although many pupils expressed negative attitudes towards smoking, their attitudes did not always correspond with their level of knowledge. Despite being aware of some dangers, a significant number of pupils were still practicing smoking. The findings showed a strong association between smoking behavior and pupils' knowledge. e ($\chi^2 = 40.28$, p = 0.000), attitudes ($\chi^2 = 5.59$, p =0.018), and practices ($\chi^2 = 15.90$, p = 0.001).

Keywords: Attitude, Knowledge, Practice, Tobacco Smoking.

Introduction

Tobacco smoking continues to be the leading cause of preventable diseases and early death worldwide. According to the latest data from the Centers for Disease Control and Prevention [1], smoking is associated with a wide range of serious health conditions, including lung diseases, cancer, stroke, diabetes, heart diseases, and chronic obstructive pulmonary diseases such as emphysema and chronic bronchitis. The World Health Organization [2] has reported that tobacco use remains a significant global challenge, with over 80% of the world's 1.3 billion smokers living in lowand middle-income countries. In these regions, the burden of tobacco-related illnesses and deaths is particularly severe. Projections suggest that, without urgent action, the number of smokers worldwide could rise to 1.5 to 1.9 billion by 2025, leading to over 8 million deaths annually, with 80% of these deaths occurring in developing countries [3].

China plays a dominant role in the global tobacco industry, producing 42% of the world's cigarettes. The WHO Framework Convention on Tobacco Control [4] continues to promote comprehensive policies to control tobacco use, including bans on both direct and indirect advertising. However, challenges remain, especially in countries where tobacco farming is a major economic activity [5].

Recent statistics from the General Health Observatory [6] highlight concerning trends in Africa, with smoking rates expected to rise from 6% to 14% between 2017 and 2025 among individuals aged 15 years and older. In Sub-Saharan Africa, smoking is still more common among men, but some countries, such as Ghana, Nigeria, Ethiopia, Kenya, Zimbabwe, and Tanzania, report relatively lower rates of daily smoking, with fewer than 700,000 smokers per day [7]. Alarmingly, there is a growing prevalence of smoking among young people compared to adults in countries like Ethiopia, Senegal, and Nigeria, which could result in significant future health challenges [8]. A study conducted in Kenya [9] found that family members and peers play a key role in influencing students to start smoking, with a prevalence rate of 10.9% among pupils aged 16 to 18 years [10]. This reflects the continued issue of smoking among youth populations.

In Zambia, despite ongoing efforts to reduce tobacco use, smoking rates remain high, with many children and adults continuing to smoke daily [11]. Research by Drope and Cahn [12] underscores the heavy toll of tobacco-related the Zambian diseases on population, emphasizing the urgent need for effective tobacco control measures. However, there is a notable gap in research examining the knowledge, attitudes, and practices regarding tobacco smoking among pupils, especially at Kalomo Secondary School in Kalomo District. This study aims to fill this gap by evaluating the current knowledge, attitudes, and practices concerning the health risks of tobacco smoking among pupils at Kalomo Secondary School.

Materials and Methods

This study was conducted at Kalomo Secondary School, located in Kalomo District, Zambia, from 1st June 2024 to 30th November 2024. The school has a total enrollment of 937 pupils, spanning Grades 8 to 12.

A descriptive cross-sectional study design was used to assess the knowledge, attitudes, and practices (KAP) regarding tobacco smoking among pupils. The study was conducted within the school premises to ensure an appropriate environment for data collection.

The study included 273 pupils from Grades 8 to 12, selected using a simple random proportional sampling technique. The class registers served as the sampling frame to ensure equitable representation across all grade levels.

The sample size was determined using Krejcie and Morgan's formula, which is commonly used for determining appropriate sample sizes based on population size and confidence level. The formula is:

n= X². N.P.(1-P)

 d^2 .. (N-1)+X².P.(1-P)

n = Required sample size

N = Population size

P = Population proportion (assumed to be 0.50, which gives the maximum sample size)

d = Degree of accuracy (usually the margin of error, often 0.05)

 X^2 = Chi-square value at a given confidence level (for 95% confidence, X^2 = 3.841)

Sample size calculation:

3.841 .937 0.50 (1-0.50)

 $0.05^{2.937-1}$ 3.841.0.50. (1-0.50)

After applying this formula, the final sample size was determined to be 273 pupils, aged between 14 and 20 years old.

A structured questionnaire was used to collect data on pupils' knowledge, attitudes, and practices regarding tobacco smoking. The questionnaire was adapted from established U.S.-based research tools, including Youth Risk Behavior Survey (YRBS) – developed by the Centers for Disease Control and Prevention [13], and Global Youth Tobacco Survey (GYTS) – developed by the World Health Organization [14].

To ensure reliability and validity, the questionnaire underwent:

Pilot testing on 30 pupils (excluded from the main study) to assess clarity and consistency.

Expert review by public health specialists and education professionals.

Content adaptation to align with the Zambian context while maintaining international comparability.

The questionnaire was divided into four sections:

Section A – Socio-demographic information (age, gender, grade level, etc.).

Section B – Knowledge on tobacco smoking, consisting of multiple-choice questions (MCQs) and filling in the blank spaces. Each correct answer was awarded one mark (1), while incorrect answers received zero (0).

Section C – Attitudes towards smoking interventions assessed using a Likert scale to measure perceptions and beliefs about smoking and smoking-related interventions.

Section D – Practices related to smoking, including exposure to tobacco use and personal smoking behaviors.

Data were entered and analyzed using SPSS version 25. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize findings. Chi-square tests of association and Fisher's exact test were used to examine relationships between categorical variables. A p-value of <0.05 was considered statistically significant. Multiple regression analysis was conducted to identify predictors of tobacco smoking among pupils [15].

Results

This study found that while most pupils are aware of the harmful effects of tobacco smoking, many still engage in the habit due to peer pressure, stress relief, and social influence. Around 65% of the respondents acknowledged that smoking is harmful to their health; however, 30% believed it helps reduce stress and boosts social status. These findings are in line with the Global Youth Tobacco Survey [14], which highlighted peer influence as a major reason why adolescents start smoking.

The study also uncovered gaps in knowledge regarding the long-term health risks of smoking. While many pupils were aware that smoking can cause lung cancer and breathing problems, a significant number did not know it also increases the risk of heart disease and shortens life expectancy [15]. This demonstrates the need for better health education in schools to ensure that students fully understand all the dangers associated with tobacco use.

Accessibility to cigarettes was another serious concern. Despite Zambia's tobacco control laws, pupils reported that they could easily acquire cigarettes from street vendors, informal shops, and even family members. This support concerns raised by the Ministry of Health (MOH, 2021), which pointed out the weak enforcement of tobacco regulations and called for stricter controls to prevent underage access to tobacco products.

Family and community influence also played a major role. Pupils from homes where parents or siblings smoked were more likely to adopt the habit themselves, compared to those from smoke-free households. This is consistent with findings from earlier studies, which showed that parents' smoking behavior strongly influences whether their children start smoking [17].

Given these findings, it is evident that stronger anti-tobacco education is urgently needed in schools. Programs should be incorporated into the school curriculum and should provide students with accurate, sciencebased information about the dangers of smoking. Communities should also be involved through awareness campaigns that help parents understand how their actions and attitudes can shape their children's choices.

Finally, enforcement of tobacco laws must be improved. Selling cigarettes to minors should be strictly monitored and punished where necessary. Public health messages should be widely disseminated, and authorities must collaborate with law enforcement and health professionals to make tobacco products less accessible to young people [18].

Discussion

This study found that, while most pupils are aware of the harmful effects of tobacco smoking, a significant number still engage in the habit due to peer influence, stress relief, and social pressures. About 65% of respondents acknowledged that smoking is harmful to their health, yet 30% believed that it helps relieve stress and improves social status. These findings align with the Global Youth Tobacco Survey [14], which highlighted peer pressure as a major factor in adolescent smoking initiation.

The study also identified knowledge gaps regarding the long-term health effects of smoking. While many students recognized diseases like lung cancer and respiratory disorders as smoking-related, a significant number were unaware of other risks, such as cardiovascular disease and reduced life expectancy [15]. This highlights the need for more comprehensive health education programs in schools to ensure students fully understand the dangers of tobacco use.

Another critical factor in adolescent smoking behavior is accessibility. Despite Zambia's tobacco control policies, students reported that they could easily buy cigarettes from informal vendors, street sellers, and even family members. This finding supports the Ministry of Health's (MOH, 2021) concerns about the weak enforcement of tobacco regulations, emphasizing the need for stricter control to prevent underage access to tobacco products.

Family and community influence also play a major role in adolescent smoking habits. Pupils from households where parents or siblings smoke were more likely to pick up the habit compared to those from non-smoking homes. This observation is consistent with existing research, showing that parental smoking behavior strongly influences adolescent smoking initiation [17].

Based on these findings, there is an urgent need to strengthen anti-tobacco education campaigns targeting school-aged children. Schools should integrate tobacco prevention programs into their curriculum, offering students science-based information on the dangers of smoking. Additionally, community awareness programs should be enhanced to educate parents on the role they play in shaping their children's attitudes toward tobacco use.

Stronger enforcement of tobacco control laws is also necessary, including regulating cigarette sales to minors and increasing public awareness initiatives. Authorities should work closely with law enforcement and health agencies to make tobacco products less accessible to school-aged children [18].

The largest proportion of participants (64%) were aged between 14 and 16 years, while 29% were aged 17–19 years, and 7% were aged 20 years. Gender distribution revealed that 55% of the participants were male, and 45% were female. Regarding the educational level, 41% of respondents were in Grade 9, with 23% in Grade 12, 14% in Grade 10, and 13% in Grade 8. In terms of living arrangements, 60% of the respondents lived with both parents, 19% lived with a single parent, and 21% were under the care of guardians, as shown in Table 1.

Table 1. Socio-Demographic Characteristics of Respondents (n=273)

Variables	Frequency (n)	Percentage (%)
Age Group		
14-16 years	174	64%

17-19 years	79	29%		
20 years	20	7%		
Gender				
Male	150	55%		
Female	123	45%		
Grade				
Grade 8	35	13%		
Grade 9	112	41%		
Grade 10	38	14%		
Grade 11	30	11%		
Grade 12	62	23%		
living Arrangements				
Both parents	164	60%		
Single parent	52	19%		
Guardians	57	21%		

Table 2 presents the knowledge levels on tobacco smoking among Kalomo Secondary School pupils. A significant proportion of respondents (51%) exhibited **low knowledge** on tobacco smoking, while 49% demonstrated high knowledge as shown in Table 2.

Table 2. Knowledge Levels on Tobacco Smoking among Kalomo Secondary School Pupils

Knowledge Level	Frequency	Percentage (%)
Low Knowledge	139	51%
High Knowledge	134	49%
Total	273	100%

A majority of the respondents (51%) agreed that smoking is linked to various health problems, including heart disease, stroke, and impotence. A smaller proportion (26%) believed that smoking only causes lung disease, while 10% were unsure. Notably, only 13% disagreed with the statement that smoking is associated with multiple diseases, as shown in Table 3.

Response	Frequency	Percentage (%)
Smoking causes heart disease,	140	51%
stroke, and impotence		
Smoking only causes lung disease	71	26%
Disagree	35	13%
Don't know	27	10%
Total	273	100%

Table 3. Agreement on Smoking-Related Diseases

A large majority (79%) of the students reported that they had never received any

education on the dangers of smoking, while only 14% indicated they had been taught, and 7% were unsure. This apparent gap in formal health education may be a contributing factor to

the high prevalence of smoking observed among the pupils, as presented in Table 4.

Response	Frequency	Percentage (%)
Never	216	79%
Taught	38	14%
Not sure	19	7%
Total	273	100%
Response	Frequency	Percentage (%)
Don't know	246	90%
Smoking is harmful to older people	11	4%

 Table 4. Frequency of Teaching on Dangers of Smoking

There were significant associations between age group, gender, level of education, and smoking behavior. A p-value of 0.001 for age suggests a strong relationship between age and smoking status. Likewise, gender showed a significant association (p = 0.001), indicating

that males were more likely to smoke than females. In addition, knowledge about smoking was also significantly associated with smoking behavior (p = 0.002), with pupils who had higher knowledge levels being less likely to smoke, as shown in Table 5.

Table 5. Chi-Square Test Results for Various Variables

Category	Smoked (41)	Never Smoked (232)	P-Value
Age Group	0.001		
14-16	23 (18%)	104 (82%)	
17-18	10 (11%)	83 (89%)	
19-20	8 (12%)	45 (88%)	
Gender			0.001
Male	15 (14%)	89 (86%)	
Female	26 (18%)	143 (82%)	
Level of Education			0.001
Grade 8	9 (16.7%)	45 (83.3%)	
Grade 9	8 (14.8%)	46 (85.2%)	
Grade 10	8 (14.5%)	47 (85.5%)	
Grade 11	8 (14.5%)	47 (85.5%)	
Grade 12	8 (14.5%)	47 (85.5%)	
Attitude Toward Smoking	3.419 FE		
Positive	14 (88%)	2 (13%)	
Negative	20 (87%)	3 (13%)	
Knowledge on Smoking	0.002		
High	36 (73%)	13 (27%)	
Low	136 (76%)	44 (24%)	
Living Arrangements			0.001 FE
Both Parents	12 (8%)	113 (92%)	
Single Parent	15 (13%)	104 (87%)	
Guardians	14 (20%)	15 (80%)	

Most of the respondents (67%) reported that they had smoked before. Additionally, 34.4% mentioned that they had bought cigarettes at least once. When asked about smoking among their parents or guardians, 48% said none of them smoked, 19% had one relative who smoked, and 15% had more than one, as shown in Table 6.

Question	Response	Frequency	Percentage (%)
Have you purchased	Yes	94	34.4%
cigarettes before?			
	No	179	65.6%
Have you smoked	Yes	184	67%
before?			
	No	89	33%
How many of your	None	131	48%
parents/guardians or			
relatives smoke?			
	One	52	19%
	More than one	41	15%
	Unsure	49	18%

Table 6.	Practices	of Smoking	among	Secondary	School	Pupils
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Conclusion

This study found that many pupils at Kalomo Secondary School have limited knowledge about the dangers of smoking, with 51% lacking awareness of its harmful effects. Although most students had a negative attitude toward smoking, 87% still believed in certain myths, such as smoking improving school performance. This shows the need for stronger anti-smoking education to correct misconceptions and promote awareness.

Social and cultural influences also play a major role in smoking habits. The study revealed that 67% of pupils had smoked before, with some believing it helps relieve stress. Exposure to second-hand smoke at home was also common. Statistical analysis confirmed a strong link between smoking habits, knowledge levels, and attitudes.

To reduce smoking among adolescents, schools should integrate more tobacco education into their curriculum, and families and communities must be involved in prevention efforts. Stronger enforcement of tobacco control policies is also necessary to limit access to cigarettes and protect young people from smoking-related harm.

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