

Factors explaining tobacco use among young people in the ngaba health zone: the case of the mukulua health area and proposed health education components.

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Abstract

Introduction

Smoking among young people is a major public health problem. In Mukulua, social environment, peer influence, pleasure, taste, and stress contribute to tobacco use. This study aimed to identify sociodemographic, social, and behavioral factors associated with smoking and to propose appropriate health education, including prevention and smoking cessation.

Methods

A descriptive cross-sectional analytical study was conducted from May 23 to June 25, 2026, in the Mukulua Health Area among 384 young people aged 15–30 years. Convenience sampling was used. Data were collected through a questionnaire following a pre-survey and informed consent, while maintaining confidentiality.

Results

The study found that 83.6% of young people had smoked previously, with males predominating. The social environment was the main source of information (96%). The main reasons for smoking were peer influence (33.3%), pleasure and taste (29.3%), and stress (22.1%). Age, occupation, and marital status were significantly associated with smoking.

Discussion

Smoking among young people in Mukulua was mainly associated with peer influence, pleasure, taste, and stress. Age, occupation, and marital status also showed significant associations. Despite good knowledge of the health risks, smoking prevalence remained high and cessation was difficult.

Conclusion

Smoking among young people in Mukulua is multifactorial, mainly associated with peer influence, pleasure, stress, and certain sociodemographic characteristics. Despite awareness of the risks, tobacco use remains high and quitting is difficult. Integrated, participatory, and youth-friendly health education is therefore needed.

Keywords: Smoking, Young people, Associated factors, Peer influence, Tobacco use, Health education.

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Introduction

Smoking remains one of the major public health problems worldwide. Tobacco use is associated with numerous chronic diseases, particularly cardiovascular diseases, respiratory disorders, and several types of cancer, and contributes substantially to premature mortality. All forms of tobacco use are harmful, and no level of tobacco exposure can be considered completely risk-free. Nicotine, the main substance responsible for dependence, is of particular concern among adolescents and young adults, whose brains are still developing (World Health

Organization [WHO], 2026). Adolescence and early adulthood constitute particularly important periods for the development smoking-related behaviors. The World Health Organization indicates that most tobacco use begins before the age of 18, highlighting the need for early prevention and health education interventions targeting young people (WHO, 2026). Globally, the WHO estimated in 2024 that approximately 37 million young people aged 13 to 15 years used tobacco, underscoring the importance of protecting young people from tobacco initiation and nicotine dependence (WHO, 2024).

However, smoking among young people cannot be explained solely by a lack of knowledge about its health consequences. It results from the interaction of several individual, family, social, economic, and environmental factors. A recent systematic review focusing on tobacco and alcohol use among adolescents identified age, sex, curiosity, peer influence, low socioeconomic status, low educational attainment, stressful events, exposure to advertising, and product accessibility as factors that may influence substance use behaviors (Olorunfemi et al., 2024). Peer influence deserves particular attention when studying smoking among young people. A meta-ethnography published in 2023, involving 41 qualitative studies, showed that friendship relationships, direct peer influence, a sense of group belonging, and identity formation may contribute to smoking initiation and continuation among adolescents. However, peer influence varies according to the social, educational, and cultural context, which justifies adapting prevention interventions to local realities (Hughes et al., 2023).

In addition to these social factors, the strategies employed by the tobacco and nicotine-product industries also play an important role. Products are designed and marketed in ways intended to attract new consumers and encourage continued use. Product design, flavors, colors, shapes, and certain communication strategies may contribute to making these products more attractive to children, adolescents, and young adults (WHO, 2025). The WHO also emphasizes that marketing strategies may contribute to normalizing or glamorizing tobacco use and thereby encourage initiation among young people (WHO, 2024, 2025). In this context, health education constitutes an essential component of tobacco-use prevention. It should not be limited to providing information about tobacco-related diseases but should also enable young people to develop psychosocial skills that help them resist peer pressure, recognize promotional strategies for nicotine products, manage stressful situations, and make health-promoting decisions. School-based interventions may combine education, the creation of tobacco-free environments, prevention of initiation, and support for young people who wish to quit tobacco use (WHO, 2023, 2024).

Health education should also be accompanied by access to smoking-cessation support for young people who already use tobacco. Recent WHO recommendations emphasize behavioral interventions, digital interventions, pharmacological treatments when appropriate, and the combination of different treatment strategies, particularly within clinical and community-based services (WHO, 2024).

In the Mukulua Health Area, Ngaba Health Zone, data from our survey show that 96% of respondents who had

previously heard about tobacco reported that they had received information mainly from people around them, whereas only 1% reported the media as a source of information. This finding is particularly important because 33.3% of young people who had already smoked reported that their friends also smoked, while 29.3% cited pleasure and the taste of tobacco and 22.1% cited stress as the main reasons for tobacco use. These findings suggest that the factors associated with tobacco use in this population are strongly related to the social environment, perceptions of tobacco products, and the management of emotional situations. Furthermore, 59.8% of smokers surveyed reported that they were not ready to quit, and among them, 42.2% considered quitting difficult. These findings indicate that prevention should be complemented by smoking-cessation support interventions. Difficulty in quitting may be related, in particular, to nicotine dependence, which is an important characteristic of tobacco use. The WHO therefore recommends integrating cessation counseling and support into health services and community-based programs accessible to tobacco users (WHO, 2024).

It is within this context that the present study focuses on the factors associated with tobacco use among young people in the Mukulua Health Area, Ngaba Health Zone. The study aims not only to identify the social, behavioral, and sociodemographic characteristics associated with tobacco use, but also to propose health education components adapted to the realities and needs of young people, in order to contribute to the prevention of tobacco initiation, reduction of tobacco use, and referral of young smokers to smoking-cessation support services.

Therefore, the following research questions were formulated: Main research question : What are the factors associated with tobacco use among young people aged 15 to 30 years in the Mukulua Health Area, Ngaba Health Zone, and what health education components could be proposed to prevent and reduce tobacco use? Specific research questions, What are the sociodemographic characteristics of the young people surveyed in the Mukulua Health Area, particularly in terms of age, sex, educational level, marital status, and occupation, What are the characteristics of tobacco use among the young people surveyed, particularly their smoking experience, frequency of use, willingness to quit, and expenditure on tobacco, What are the main social, behavioral, economic, and sociodemographic factors associated with tobacco use among young people in the Mukulua Health Area, Is there an association between the sociodemographic characteristics of young people, particularly age, occupation, and marital status, and their tobacco use, What are the main reasons reported by young people for tobacco use, particularly peer influence, pleasure and taste of tobacco, stress, and the desire to relieve negative feelings,

What is the level of knowledge and what are the perceptions of young people regarding the health effects of tobacco, What are their main sources of information about tobacco use? What health education components could be proposed to young people in the Mukulua Health Area to prevent tobacco initiation, reduce tobacco use, strengthen resistance to peer pressure, and promote access to smoking-cessation support?

We hypothesized that tobacco use among young people in the Mukulua Health Area is associated with sociodemographic, social, behavioral, and economic factors, and that the implementation of appropriate health education could contribute to preventing tobacco initiation and promoting a reduction in tobacco use among young people.

The young people surveyed were expected to present diverse sociodemographic characteristics, particularly in terms of age, sex, educational level, marital status, and occupation, which may be associated with their smoking behavior. The young people surveyed were also expected to present different patterns of tobacco use, characterized by occasional or regular consumption, various motivations for smoking, varying willingness to quit, and financial expenditures related to tobacco use. Tobacco use among young people was expected to be associated with several social, behavioral, economic, and sociodemographic factors, particularly social-environmental influence, stress, positive perceptions of tobacco, and certain socioeconomic conditions. A statistically significant association was expected to exist between certain sociodemographic characteristics, particularly age, occupation, and marital status, and tobacco use among young people in the Mukulua Health Area. Peer influence, pleasure and taste of tobacco, stress, and the desire to relieve negative feelings were expected to constitute important reasons reported by young people for their tobacco use.

Despite relatively good knowledge of the health consequences of tobacco use, favorable perceptions of smoking and the influence of the social environment were expected to persist among some young people, with the social environment constituting an important source of information about tobacco. Health education components focusing on the health consequences of tobacco use, prevention of initiation, resistance to peer pressure, stress management, correction of positive perceptions of tobacco, and smoking-cessation support were expected to be appropriate to the needs of young people in the Mukulua Health Area.

The general objective of this study was to analyze the factors associated with tobacco use among young people

aged 15 to 30 years in the Mukulua Health Area, Ngaba Health Zone, and to propose appropriate health education components for tobacco-use prevention among young people. To achieve this general objective, the following specific objectives were established: To describe the sociodemographic characteristics of the young people surveyed in the Mukulua Health Area, particularly their age, sex, educational level, marital status, and occupation. To describe the characteristics of tobacco use among the young people surveyed, particularly smoking experience, frequency of use, reasons for smoking, willingness to quit, and expenditure on tobacco. To identify the main social, behavioral, economic, and sociodemographic factors associated with tobacco use among young people in the Mukulua Health Area. To analyze the association between selected sociodemographic characteristics and tobacco use, particularly age, occupation, and marital status. To analyze the main reasons reported for tobacco use, particularly peer influence, pleasure and taste of tobacco, stress, and the desire to relieve negative feelings. To assess young people's knowledge and perceptions regarding the health effects of tobacco, as well as their main sources of information about tobacco use. To propose health education components for young people, focusing particularly on the health risks of tobacco, prevention of initiation, resistance to peer pressure, stress management, correction of positive perceptions of tobacco, and referral to smoking-cessation support services.

Material and methods

Study Setting

Study Area

The present study was conducted in the Ngaba Health Zone, specifically in the MUKULUA Health Area, located in the city-province of Kinshasa, Democratic Republic of the Congo. The choice of this health area was motivated by the need to document factors associated with tobacco use among young people in an urban context where social, economic, behavioral, and environmental influences may contribute to the initiation and continuation of tobacco use. The Ngaba Health Zone is a health district located in the southern part of the city of Kinshasa. According to administrative data available in the health zone report, it covers an area of approximately 4 km² and had an estimated population of 254,947 inhabitants. Its population density was estimated at approximately 50,172 inhabitants/km², reflecting a highly populated urban setting. These demographic and environmental characteristics provide a relevant context for studying tobacco-related behaviors among young people (Ngaba Health Zone, 2019).

The Ngaba Health Zone is bounded to the north by Kikwit Avenue, which separates it from the Limete Health Zone;

to the east and south by the Yolo River and By-Pass Avenue, respectively, which separate it from the Lemba Health Zone; and to the west by University Avenue, which separates it from the Makala Health Zone. These administrative and geographical boundaries precisely define the spatial setting of the study. Climatically, the area has a warm and humid tropical climate, characteristic of the southern part of the Democratic Republic of the Congo, with a relatively long rainy season and a dry season generally occurring between June and August. The area is also highly urbanized, with a high population concentration and various commercial and social activities that may influence young people's behaviors.

Rationale for Selecting the Study Site

The choice of the MUKULUA Health Area was based on the need to investigate tobacco use among young people in a community setting where factors related to social environment, peers, socioeconomic conditions, stress, perceptions of tobacco, and accessibility of tobacco products can be observed simultaneously. This approach is consistent with current knowledge indicating that tobacco use does not depend solely on knowledge of its harmful effects but results from the interaction of individual, social, behavioral, economic, and environmental factors. Nicotine is highly addictive, and early exposure is particularly concerning among adolescents and young adults, whose brains are still developing (World Health Organization [WHO], 2026).

Study Design and Period

This was a descriptive cross-sectional study with an analytical component. This design was selected because it made it possible to measure the frequency of tobacco use among young people at a given point in time and simultaneously examine the relationships between tobacco use and various sociodemographic, sociocultural, behavioral, psychological, and economic characteristics. In a cross-sectional study, exposure and the phenomenon under investigation are generally measured at the same time. This type of design is appropriate for describing the distribution of a health-related behavior and investigating associations between that behavior and different explanatory factors. However, it does not, by itself, establish a causal relationship or the temporal sequence between variables with certainty. Reporting of cross-sectional studies should specify the study setting, participants, variables, selection methods, data sources, potential biases, and statistical methods, in accordance with the STROBE recommendations (Vandenbroucke et al., 2007).

Data collection was conducted from May 23, 2026, to June 25, 2026, in the MUKULUA Health Area, Ngaba Health Zone.

Study Population

The study population consisted of young people aged 15 to 30 years residing in the MUKULUA Health Area during the survey period. This age range was selected to include adolescents and young adults, periods that are particularly important for the acquisition and consolidation of tobacco-related behaviors. Recent WHO data emphasize that nicotine is particularly concerning among adolescents and young adults because of its addictive potential and effects on the developing brain (WHO, 2026).

Target Population

The target population consisted of all young people aged 15 to 30 years living in the MUKULUA Health Area, whether or not they consumed tobacco. The accessible population consisted of young people aged 15 to 30 years who resided in the MUKULUA Health Area and who were present or accessible during the data collection period, from May 23 to June 25, 2026.

Selection Criteria

Inclusion Criteria

Participants were included if they:

- were aged 15 to 30 years;
- resided in the MUKULUA Health Area;
- were present during the data collection period;
- voluntarily agreed to participate in the study;
- were able to answer the questionnaire;
- for participants under 18 years of age, had obtained the required consent in accordance with the ethical procedures adopted for the study.

The inclusion of both smokers and non-smokers was essential to allow comparative analysis of factors potentially associated with tobacco use.

Non-Inclusion Criteria

The following individuals were not included:

- young people aged below 15 years or above 30 years;

- individuals who did not reside in the MUKULUA Health Area;
- individuals unable to answer the questionnaire at the time of the survey;
- individuals who refused to participate in the study.

Exclusion Criteria

The following questionnaires were excluded from the analysis:

- questionnaires that were insufficiently completed;
- questionnaires containing major inconsistencies;
- questionnaires that did not allow the participant's smoking status to be determined.

The prior definition of eligibility criteria and the description of participant selection procedures are important elements in reporting cross-sectional studies, in accordance with the STROBE recommendations (Vandenbroucke et al., 2007).

Sample Size

The sample size was determined using the classical formula for estimating a proportion in a population:

$$n = \frac{Z^2 \cdot p \cdot q}{d^2} \text{ where:}$$

- n = minimum sample size;
- Z = value corresponding to a 95% confidence level, i.e., 1.96;
- p = expected proportion of the phenomenon under study;
- $q = 1 - p$;
- d = acceptable margin of error, set at 5%.

When the actual proportion of the phenomenon is not known with sufficient precision, using $p = 50\%$ provides the largest and most conservative sample size. Thus: $n = (1.96)^2 \times (0.50) \times (0.50) / (0.05)^2 = 384.16$ Therefore, the theoretical minimum sample size was approximately 384 participants. Accordingly, 384 young people aged 15 to 30 years were included in the study.

Sampling and Participant Recruitment

Given the practical conditions of the survey and the accessibility of the study population, a non-probability

convenience sampling method was used. Participants were recruited among young people aged 15 to 30 years who were present in the MUKULUA Health Area during the data collection period, from May 23 to June 25, 2026, and who met the eligibility criteria defined for the study. Young people were recruited regardless of whether they had previously used tobacco. After inclusion, they were classified according to their tobacco-use status: young people who had never smoked, those who had smoked previously, and those who were currently using tobacco. This procedure avoided restricting the study to smokers alone and allowed comparisons between the different participant groups. Participants were recruited from various locations frequented by young people in the MUKULUA Health Area, including community spaces, commercial areas, schools or universities, sports facilities, and other accessible locations during the survey period. Investigators approached young people present in these different settings and first verified their eligibility before conducting the interview. Diversifying recruitment locations was intended to reduce, as much as possible, the risk of selecting only young people belonging to the same social environment.

The sample size was set at 384 participants. This number provided a sufficient sample to describe the characteristics of the study population and explore relationships between tobacco-use status and the different factors investigated. However, given the non-probability nature of the sampling method, the results should be interpreted with caution and cannot automatically be generalized to all young people in the Ngaba Health Zone.

2.7. Pre-Survey

Before the actual data collection began, a pre-survey was conducted among a small group of young people with characteristics similar to those of the study population.

The objectives of the pre-survey were to:

- assess the participants' understanding of the questions;
- identify ambiguous wording;
- estimate the average interview duration;
- verify the consistency of response options;
- assess understanding of sensitive questions related to tobacco use;
- improve the practical organization of data collection.

Participants involved in the pre-survey were not included in the final sample.

Data Collection Procedure

Data collection was conducted from May 23, 2026, to June 25, 2026. Investigators administered the questionnaire directly to young people who met the inclusion criteria. Before each interview, the objectives of the study were explained to the participant, and their consent to participate was obtained. Questions concerning tobacco use were asked confidentially in order to minimize, as much as possible, the tendency to conceal or underestimate tobacco consumption. The confidentiality of the information collected was maintained throughout the study, with strict adherence to ethical standards for research involving human participants and the principles of free and informed consent.

Results

Sociocultural and Demographic Characteristics

Table 1. Distribution of Respondents According to Sex

Sex	N	%
Male	253	65.9
Female	131	34.1
Total	384	100.0

The analysis of this table shows that 253 respondents (65.9%) were male, whereas 131 respondents (34.1%) were female.

Table 2. Distribution of Respondents According to Age

Age	n	%
15–19 years	101	26.3
20–24 years	63	16.4
25–29 years	121	31.5
30 years and above	99	25.8
Total	384	100.0

The results show that 101 respondents (26.3%) were aged 15–19 years, followed by 99 respondents (25.8%) aged 30 years and above.

Table 3. Distribution of Respondents According to Educational Level

Educational level	n	%
No formal education	68	17.7
Primary	21	5.5
Secondary	237	61.7

University	58	15.1
Total	384	100.0

The analysis of this table shows that 237 respondents (61.7%) had secondary education, followed by 68 respondents (17.7%) who had no formal education. A total of 21 respondents (5.5%) had primary education.

Table 4. Distribution of Respondents According to Marital Status

Marital status	n	%
Single	198	51.6
Married	31	8.1
Cohabiting	130	33.9
Other	25	6.5
Total	384	100.0

The results show that 198 respondents (51.6%) were single, followed by 130 respondents (33.9%) who were living in a cohabiting relationship.

Table 5. Distribution of Respondents According to Occupation

Occupation	n	%
Unemployed	122	31.8
Government employee	13	3.4
Private-sector employee	26	6.8
Retail vendor	187	48.7
Trader	20	5.2
Other	16	4.2
Total	384	100.0

The results indicate that 187 respondents (48.7%) were retail vendors, followed by 122 respondents (31.8%) who were unemployed.

Tobacco-Related Characteristics

Table VI. Distribution of Respondents According to Whether They Had Ever Heard About Tobacco

Had ever heard about tobacco	n	%
Yes	344	89.6
No	40	10.4
Total	384	100.0

The results show that 344 respondents (89.6%) had already heard about tobacco, whereas 40 respondents (10.4%) reported that they had never heard about tobacco.

Table 7. Distribution of Respondents According to the Source of Information About Tobacco

Source of information about tobacco	n	%
Media	4	1.0
Relatives/friends/social circle	330	96.0
Other sources	10	3.0
Total	344	100.0

The data show that 330 respondents (96.0%) had received information about tobacco mainly from people around them, followed by 10 respondents (3.0%) who reported other sources, while only 4 respondents (1.0%) reported the media as their source of information.

Table 8. Distribution of Respondents According to Their Knowledge of the Health Consequences of Tobacco

Knowledge of the health consequences of tobacco	n	%
Yes	299	77.9
No	85	22.1
Total	384	100.0

The results indicate that 299 respondents (77.9%) knew the health consequences of tobacco use, whereas 85 respondents (22.1%) did not know the health consequences of tobacco use.

Table 9. Distribution of Respondents According to Their Opinion About Tobacco

Is tobacco good or bad?	n	%
Good	188	49.0
Bad	196	51.0
Total	384	100.0

The analysis shows that 196 respondents (51.0%) considered tobacco to be harmful, whereas 188 respondents (49.0%) considered tobacco to be good.

Table 10. Distribution of Respondents According to Whether They Had Ever Smoked

Ever smoked	n	%
Yes	321	83.6
No	63	16.4
Total	384	100.0

The results show that 321 respondents (83.6%) had smoked at least once, compared with 63 respondents (16.4%) who had never smoked.

Table 11. Distribution of Respondents According to Frequency of Smoking

Frequency of smoking	n	%
Once	34	10.6
More than once	99	30.8
Almost every day	121	37.7
Not at all	67	20.9
Total	321	100.0

The data show that 121 respondents (37.7%) smoked almost every day, followed by 99 respondents (30.8%) who had smoked more than once, whereas 34 respondents (10.6%) had smoked only once.

Table 12. Distribution of Respondents According to the Main Reasons for Smoking

Main reason for smoking	n	%
Pleasure and taste of tobacco	94	29.3
Desire to relieve negative feelings	26	8.1
Because friends smoke	107	33.3
Because of stress	71	22.1
Other reasons	23	7.2
Total	321	100.0

The results show that 107 respondents (33.3%) reported smoking because their friends smoked, followed by 94 respondents (29.3%) who smoked for the pleasure and taste of tobacco, whereas 23 respondents (7.2%) reported other reasons.

Table 13. Distribution of Respondents According to Their Willingness to Quit Smoking

Willing to quit smoking	n	%
Yes	132	40.2
No	192	59.8
Total	321	100.0

The results indicate that 192 respondents (59.8%) were not willing to quit smoking, whereas 132 respondents (40.2%) reported that they were willing to quit.

Table 14. Distribution of Respondents According to Reasons for Wanting to Quit Smoking

Reason for wanting to quit smoking	n	%
Lack of money	26	19.7
Tobacco kills	83	62.9
Difficult to quit	4	3.0
Expense	7	5.3
Other reasons	12	9.1
Total	132	100.0

The data indicate that 83 respondents (62.9%) were willing to quit smoking because they believed that tobacco causes death, followed by 26 respondents (19.7%) who cited lack of money. In addition, 7 respondents (5.3%) stated that they wanted to quit because smoking involved significant financial expenditure.

Table 15 : Distribution of Respondents According to Reasons for Not Wanting to Quit Smoking

Reason for not wanting to quit smoking	n	%
Personal choice/will	60	31.2
Maintaining their status	27	14.0
Reducing the risk of disease and stress	24	12.5
Difficult to quit	81	42.2
Total	192	100.0

The results show that 81 respondents (42.2%) reported that quitting was difficult, followed by 60 respondents (31.2%) who did not want to quit by personal choice. Furthermore, 24 respondents (12.5%) cited reducing the risk of disease and stress.

Table 16. Distribution of Respondents According to Daily Expenditure on Tobacco

Daily expenditure on tobacco	N	%
Less than one dollar	77	23.9
One dollar	51	16.0
More than one dollar	193	60.1
Total	321	100.0

The results show that 193 respondents (60.1%) spent more than one dollar per day on tobacco, followed by 77 respondents (23.9%) who spent less than one dollar per day.

Bivariate Analysis

Table 17. Distribution of Respondents According to Smoking Status and Marital Status

Marital status	Ever smoked: Yes	Ever smoked: No	Total
Single	198 (100.0%)	0 (0.0%)	198 (100.0%)
Married	31 (100.0%)	0 (0.0%)	31 (100.0%)
Cohabiting	92 (70.8%)	38 (29.2%)	130 (100.0%)
Other	0 (0.0%)	25 (100.0%)	25 (100.0%)
Total	321 (83.6%)	63 (16.4%)	384 (100.0%)

Chi-square = 1.879; df = 3; p < 0.001.

The analysis indicates that, among the 384 respondents, 321 (83.6%) reported having smoked at least once. Among them, 198 (100.0%) were single, 92 (70.8%) were living in a cohabiting relationship, and 31 (100.0%) were married. Among the 63 respondents (16.4%) who had never smoked, 38 (29.2%) were living in a cohabiting relationship. The results indicate a statistically significant association between marital status and having ever smoked (p < 0.001).

Table 18. Distribution of Respondents According to Smoking Status and Age

Age group	Ever smoked: Yes	Ever smoked: No	Total
15–19 years	101 (100.0%)	0 (0.0%)	101 (100.0%)
20–24 years	63 (100.0%)	0 (0.0%)	63 (100.0%)
25–29 years	121 (100.0%)	0 (0.0%)	121 (100.0%)
30 years and above	36 (36.4%)	63 (63.6%)	99 (100.0%)
Total	321 (83.6%)	63 (16.4%)	384 (100.0%)

Chi-square = 2.170; df = 3; $p < 0.001$.

The data show that, among the 321 respondents (83.6%) who had ever smoked, 101 (100.0%) were aged 15–19 years, 63 (100.0%) were aged 20–24 years, and 121 (100.0%) were aged 25–29 years. Among those aged 30 years and above, 36 (36.4%) had smoked, while 63 (63.6%) had never smoked. The results indicate a statistically significant association between age and tobacco use ($p < 0.001$).

Table 19. Distribution of Respondents According to Main Reason for Smoking and Age

Age group	Pleasure and taste	Relief of negative feelings	Friends smoke	Stress	Other reasons	Total
15–19 years	93 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	93 (100.0%)
20–24 years	1 (1.7%)	26 (44.1%)	32 (54.2%)	0 (0.0%)	0 (0.0%)	59 (100.0%)
25–29 years	0 (0.0%)	0 (0.0%)	74 (67.9%)	35 (32.1%)	0 (0.0%)	109 (100.0%)
30 years and above	0 (0.0%)	0 (0.0%)	1 (1.7%)	36 (60.0%)	23 (38.3%)	60 (100.0%)
Total	94 (29.3%)	26 (8.1%)	107 (33.3%)	71 (22.1%)	23 (7.2%)	321 (100.0%)

The data show that, among the 321 respondents who had smoked, 94 (29.3%) reported pleasure and taste of tobacco as the main reason for smoking, including 93 (100.0%) aged 15–19 years and 1 (1.7%) aged 20–24 years.

Furthermore, 26 respondents (8.1%) smoked to relieve negative feelings, with 26 (44.1%) of the respondents

aged 20–24 years. A total of 107 respondents (33.3%) reported smoking because their friends smoked, including

32 (54.2%) aged 20–24 years and 74 (67.9%) aged 25–29 years. In addition, 71 respondents (22.1%) cited stress, including 35 (32.1%) aged 25–29 years and 36 (60.0%) aged 30 years and above. Overall, the findings suggest a statistically significant difference in the main reasons for smoking across age groups.

Table 20. Distribution of Respondents According to Smoking Status and Occupation

Occupation	Ever smoked: Yes	Ever smoked: No	Total
Unemployed	122 (100.0%)	0 (0.0%)	122 (100.0%)
Government employee	13 (100.0%)	0 (0.0%)	13 (100.0%)
Private-sector employee	26 (100.0%)	0 (0.0%)	26 (100.0%)
Retail vendor	160 (85.6%)	27 (14.4%)	187 (100.0%)
Trader	0 (0.0%)	20 (100.0%)	20 (100.0%)
Other	0 (0.0%)	16 (100.0%)	16 (100.0%)
Total	321 (83.6%)	63 (16.4%)	384 (100.0%)

Chi-square = 2.156; df = 5; $p < 0.001$.

The data show that, among the 321 respondents (83.6%) who had smoked, 160 (85.6%) were retail vendors, followed by 122 (100.0%) who were unemployed. Among the 63 respondents (16.4%) who had never smoked, 27 (14.4%) were retail vendors. The findings indicate a statistically significant association between smoking status and occupation ($p < 0.001$).

Table 21. Distribution of Respondents According to Smoking Status and Marital Status

Marital status	Ever smoked: Yes	Ever smoked: No	Total
Single	198 (100.0%)	0 (0.0%)	198 (100.0%)
Married	31 (100.0%)	0 (0.0%)	31 (100.0%)
Cohabiting	92 (70.8%)	38 (29.2%)	130 (100.0%)
Other	0 (0.0%)	25 (100.0%)	25 (100.0%)
Total	321 (83.6%)	63 (16.4%)	384 (100.0%)

Chi-square = 1.879; df = 3; $p < 0.001$.

The analysis indicates that, among the 384 respondents, 321 (83.6%) had smoked at least once. Of these, 198 (100.0%) were single, 92 (70.8%) were living in a cohabiting relationship, and 31 (100.0%) were married. Among the 63 respondents (16.4%) who had never smoked, 38 (29.2%) were living in a cohabiting relationship. The findings indicate a statistically significant association between marital status and having ever smoked ($p < 0.001$).

Discussion

The general objective of this study was to analyze the factors associated with tobacco consumption among young people aged 15 to 30 years in the MUKULUA Health Area, NGABA Health Zone. More specifically, the study aimed to identify the sociodemographic characteristics of the respondents, determine the main reasons associated with tobacco consumption, and investigate the existence of a relationship between certain characteristics of the respondents and having ever smoked.

The study included 384 respondents. The results showed that 321 respondents, representing 83.6%, had ever smoked, whereas 63 respondents, representing 16.4%, had never smoked. However, this high proportion should be interpreted with caution because the variable assessed was having “ever smoked” and not necessarily current or daily smoking. In addition, the non-probability sampling method used in this study limits the generalizability of the findings to all young people in the NGABA Health Zone.

Influence of Social Environment and Peers on Tobacco Consumption

One of the most important findings of our study concerns the influence of the social environment. Among the 321 respondents who had ever smoked, 107 (33.3%) reported that they had started smoking or smoked because their friends smoked. This proportion was the main reason reported in our study, followed by pleasure and the taste of tobacco (29.3%) and stress (22.1%).

This finding highlights the importance of peer groups in the initiation and maintenance of smoking behavior among young people. It is consistent with the findings of Littlecott et al. (2023), who, in a systematic review and meta-ethnography involving 41 studies, showed that

friendships, group norms, and direct peer influence play an important role in smoking initiation among adolescents. The authors particularly emphasize that smoking may serve as a means of group belonging and social identity formation.

Our findings are also consistent with recent African literature. A systematic review focusing on Nigerian adolescents published in 2024 reported that peer influence, lack of parental supervision, curiosity, stressful events, low socioeconomic status, and accessibility of tobacco products are among the factors associated with tobacco use among adolescents.

Thus, in the MUKULUA Health Area, the fact that nearly one-third of smokers reported smoking because their friends smoked suggests that prevention interventions

should not target individuals alone. They should also involve peer groups, families, schools, youth associations, and other socialization settings. This observation is also

consistent with data from the World Health Organization, which recognizes the importance of social influences in the adoption of smoking among young people. WHO also

emphasizes that tobacco and nicotine industry strategies specifically seek to reach young people and normalize consumption.

Reasons for Tobacco Consumption and the Influence of Age

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Our results show important differences according to age regarding the reported reasons for smoking. Among respondents aged 15–19 years, 93 out of 93 respondents in this response category reported smoking for pleasure and because they liked the taste of tobacco. Among those aged 20–24 years, the desire to alleviate negative feelings and peer influence played an important role. Among respondents aged 25–29 years, peer influence and stress were more prominent. Among those aged 30 years and above, stress was the main reported reason.

These findings suggest that motivations for tobacco use may vary with age. Among younger respondents, experimentation, pleasure, curiosity, and social influence may be particularly important, whereas among older young adults, smoking may be more closely associated with stress management or already established habits. This trend is consistent with the systematic review published by

Influence of Occupation

The study also showed differences according to occupation. Among respondents who had ever smoked, retail sellers accounted for 160 individuals, representing 85.6% of respondents in this occupational category, while respondents with no occupation accounted for 122 individuals, representing 100% of their category.

These findings suggest an association between occupation and having ever smoked in our sample. However, it would be excessive to state that occupation directly “causes” tobacco consumption. Several factors may be involved, including age, income, social environment, exposure to other smokers, accessibility of tobacco, and working conditions.

Influence of Marital Status

Regarding marital status, our results show that 198 out of 198 single respondents had ever smoked, representing 100%, while 92 out of 130 respondents living in a common-law union had ever smoked, representing 70.8%. Among married respondents, all 31 respondents also reported having ever smoked.

The statistical test presented in the table indicates a statistically significant association between marital status and having ever smoked ($p < 0.001$). However, this

Adebiyi et al. (2024) on tobacco and alcohol use among Nigerian adolescents. The authors identified age, curiosity, peer influence, and stressful events among the factors associated with consumption behaviors.

WHO also emphasizes the particular vulnerability of adolescents to nicotine initiation. In 2024, WHO estimated that approximately 37 million young people aged 13–15 years worldwide used tobacco products, highlighting the importance of preventing initiation during adolescence. In our study, however, the observed association between age and having ever smoked should be interpreted cautiously. The tables show that respondents aged 15–19, 20–24, and 25–29 years were all reported as having ever smoked, whereas non-smokers were found mainly in the 30 years and above category. This highly unbalanced distribution may partly explain the statistical significance observed.

The systematic review conducted among adolescents in Nigeria by Adebiyi et al. (2024) similarly shows that tobacco consumption is determined by multiple levels of factors, including individual, interpersonal, organizational, community, and policy-related factors. The authors particularly mention socioeconomic status, education, social environment, product accessibility, and stressful events.

In the MUKULUA context, the high proportion of retail sellers among respondents who had ever smoked may therefore be considered a signal requiring further analysis of their living and working conditions and their exposure to tobacco.

association should be interpreted cautiously because some categories had highly unbalanced numbers, particularly the “other” category, in which no respondent reported having ever smoked.

Therefore, it would be methodologically more appropriate to state that marital status was statistically associated with having ever smoked in our sample, rather than claiming that it “influences” or directly “causes” tobacco consumption.

This distinction is important because a cross-sectional study alone cannot establish a causal relationship. Marital status may be associated with other variables such as age, occupational status, family responsibilities, or social environment.

Page | 12 **Frequency of Consumption and Risk of Dependence**

Our results indicate that among the 321 respondents who had ever smoked, 121 (37.7%) reported smoking almost every day, while 99 (30.8%) reported having smoked more than once. This situation indicates that a substantial proportion of respondents who had experimented with tobacco did not limit their consumption to occasional experimentation.

This finding is particularly concerning among young people because repeated exposure to nicotine may contribute to the development of dependence. WHO emphasizes that the tobacco and nicotine industry specifically seeks to promote sustained consumption among young people and maintain their dependence.

The finding that 59.8% of the smokers interviewed were not ready to quit is also important. Among those who wanted to quit, 62.9% mentioned that “tobacco kills,” whereas among those who did not want to quit, 42.2% reported that quitting was difficult.

These findings may reflect both a good awareness of some of the dangers of tobacco and the existence of barriers to quitting. They therefore suggest that information about the dangers of tobacco alone may not be sufficient to promote cessation. Smoking-cessation interventions and behavioral support may be necessary.

Knowledge of Tobacco and Perception of Its Effects

Our study revealed that 344 respondents, representing 89.6%, had already heard about tobacco, and 299 respondents, representing 77.9%, knew about its health consequences. However, despite this relatively high level of exposure to information and knowledge, 321 respondents, representing 83.6%, had already smoked.

This finding demonstrates a gap between knowledge of risk and behavior. Knowledge of the dangers of tobacco does not necessarily guarantee the absence of tobacco consumption.

This result is particularly interesting because 51.0% of respondents considered tobacco to be harmful, whereas

49.0% still considered it to be good. This ambivalent perception may contribute to maintaining smoking behavior.

Recent work by Littlecott et al. (2023) shows that social norms and relational environments influence how adolescents perceive and interpret smoking. WHO also emphasizes that marketing strategies and social positioning may contribute to presenting tobacco and nicotine products as being associated with lifestyle, popularity, or social belonging.

Expenditure on Tobacco

Another important finding concerns expenditure. Among the 321 respondents who had ever smoked, 193 (60.1%) reported spending more than one dollar per day on tobacco. This expenditure represents a considerable economic burden, particularly for a young population containing a substantial proportion of people without employment and retail sellers.

Daily expenditure may also contribute to maintaining smoking behavior. Economic measures are an important component of tobacco-control policies. Data compiled by WHO indicate that increasing the price of tobacco products, particularly through taxation, can reduce initiation and consumption among young people.

Summary in Relation to the Research Hypotheses

Overall, our findings provide evidence supporting the first hypothesis, according to which the social environment, particularly friends, stress, and certain personal motivations, are associated with tobacco consumption among young people in the MUKULUA Health Area. Peer influence was notably the main reported reason for consumption, accounting for 33.3%, followed by pleasure and the taste of tobacco at 29.3% and stress at 22.1%.

These findings are consistent with the recent work of Littlecott et al. (2023) and the African review by Adebisi et al. (2024), which identify peer influence, curiosity, and stressful situations among factors associated with smoking among young people.

The second hypothesis, concerning the existence of a relationship between sociodemographic characteristics and having ever smoked, also receives statistical support in our sample, particularly for age, occupation, and marital status. Nevertheless, these associations should not be interpreted as causal relationships, given the cross-

sectional nature of the study and the imbalances observed between certain categories.

Finally, our findings show that tobacco prevention among young people in MUKULUA should go beyond the simple dissemination of health messages. It should incorporate young people's social environment, peer groups, family, prevention of early initiation, smoking-cessation support, reduction of tobacco accessibility, and awareness of tobacco-industry strategies. This approach is consistent with recent WHO recommendations and findings concerning the protection of young people from nicotine initiation and dependence.

Conclusion

At the end of this study entitled "Factors Explaining Tobacco Smoking among Young People in the Ngaba Health Zone: The Case of the Mukulua Health Area and Proposed Health Education Measures," conducted among 384 young people aged 15 to 30 years in the Mukulua Health Area, we sought to identify the main factors associated with tobacco consumption and to propose appropriate health education measures for this population.

The general objective was to analyze the factors associated with tobacco consumption among young people aged 15 to 30 years in the Mukulua Health Area, Ngaba Health Zone, and to propose appropriate health education measures for tobacco-use prevention among young people. To achieve this objective, a descriptive cross-sectional study with an analytical component was conducted from May 23 to June 25, 2026. Data were collected from 384 young people using a questionnaire administered directly to the participants. The analysis focused on sociodemographic characteristics, tobacco-use characteristics, reasons for smoking, willingness to quit, knowledge and perceptions regarding tobacco, as well as associations between certain sociodemographic characteristics and having ever smoked.

The results showed that the study population was predominantly male (65.9%). The 25–29-year age group accounted for 31.5% of respondents, followed by those aged 15–19 years (26.3%), those aged 30 years and above (25.8%), and those aged 20–24 years (16.4%). Regarding educational level, 61.7% had secondary education. Concerning marital status, 51.6% were single and 33.9% were living in a common-law union. In terms of occupation, retail sellers represented 48.7%, while 31.8% had no occupation.

Regarding knowledge about tobacco, 89.6% of respondents had already heard about tobacco. However, the main source of information was the social environment

(96%), compared with only 1% for the media. This finding highlights the considerable role of the social environment in the circulation of information and perceptions concerning tobacco. Although 77.9% of respondents reported knowing the health consequences of tobacco use, perceptions remained concerning: 49% still considered tobacco to be good, compared with 51% who considered it harmful. Thus, awareness of health risks does not appear to be sufficient to positively change young people's perceptions and behaviors.

Regarding smoking experience, the results revealed a high proportion of young people who had ever smoked: 83.6%, compared with 16.4% who had never smoked. Among the 321 young people who had ever smoked, 37.7% reported smoking almost every day, while 30.8% had smoked more than once and 10.6% only once. These findings show that tobacco use was not merely an occasional experience for some respondents but had become a repeated practice that could contribute to dependence.

The main reported reasons for tobacco use are particularly revealing. Peer influence was the most frequently reported reason, accounting for 33.3%, followed by pleasure and the taste of tobacco (29.3%) and stress (22.1%). The desire to alleviate negative feelings accounted for 8.1%. These findings show that smoking among young people in Mukulua is associated with both social factors, particularly peer influence, and behavioral and emotional factors, particularly the pursuit of pleasure and stress management. The social environment therefore appears to be a central element in explaining smoking initiation and maintenance.

The study also highlights an important difficulty regarding smoking cessation. Indeed, 59.8% of young people who had ever smoked were not ready to quit, compared with 40.2% who reported being willing to quit. Among those who wanted to quit, 62.9% cited the fact that tobacco kills, while 19.7% mentioned lack of money. Conversely, among those who did not want to quit, 42.2% reported that quitting was difficult, while 31.2% indicated that it was a matter of their own will. These findings suggest difficulties in breaking the smoking habit and highlight the need to complement information-based interventions with behavioral-change and smoking-cessation support.

From an economic perspective, 60.1% of smokers reported spending more than one dollar per day on tobacco. This daily expenditure is an important issue to consider in health education because it makes it possible to address not only the health consequences of smoking but also its individual and household economic consequences.

The bivariate analysis also showed a statistically significant association between having ever smoked and certain sociodemographic characteristics, particularly age, occupation, and marital status, with a reported p-value of 0.000 in the analyzed tables. Regarding age, the proportion of young people who had ever smoked was particularly high among the 15–19, 20–24, and 25–29-year age groups, whereas participants aged 30 years and above included all the non-smokers in the sample. Regarding occupation, all young people with no occupation, civil servants, and company employees in the sample reported having ever smoked, while the proportion who had ever smoked among retail sellers was 85.6%. Regarding marital status, smoking was also very common among single and married respondents, while 70.8% of young people living in a common-law union had ever smoked.

These findings support the hypothesis that certain sociodemographic characteristics are associated with tobacco consumption among young people in the Mukulua Health Area. However, they should be interpreted with caution. Since the study was cross-sectional and used non-probability convenience sampling, the observed associations do not allow us to conclude that age, occupation, or marital status are directly responsible for smoking. Similarly, a statistical association does not necessarily imply a causal relationship.

Regarding the objectives related to social and behavioral factors, the findings also support the hypothesis that peer influence, pleasure and the taste of tobacco, stress, and the search for relief from negative feelings are important factors reported by young people to explain their tobacco use. The predominance of the social environment as a source of information and the importance of smoking associated with friends show that prevention should not be limited to the individual but should also involve the family, friends, school, and community environment.

In light of these findings, the present study proposes several health education measures for young people in the Mukulua Health Area. These measures should focus particularly on:

1. Raising awareness of the health effects of tobacco, by explaining in simple terms the respiratory, cardiovascular, cancer-related, and addictive consequences of tobacco use;
2. Preventing smoking initiation, particularly among adolescents and young adults who have never smoked;
3. Building resistance to peer pressure, by developing psychosocial skills that enable young

people to refuse a cigarette without fearing rejection by their peer group;

4. Managing stress and emotions, by promoting healthy alternatives such as physical activity, leisure activities, communication, relaxation, and seeking social support;
5. Challenging positive perceptions of tobacco, particularly the belief that tobacco necessarily provides pleasure, reduces stress, or improves social integration;
6. Raising awareness of the economic consequences, by demonstrating that daily expenditure on tobacco can represent a significant financial burden;
7. Providing information about nicotine dependence and the difficulties of quitting, in order to avoid blaming young people who experience difficulties in stopping smoking;
8. Referring young people to health services and smoking-cessation support, particularly those who wish to quit but are unable to do so on their own;
9. Involving the social environment, since it constitutes the main source of information about tobacco in our study population.

Thus, health education to be implemented in the Mukulua Health Area should be participatory, adapted to young people's language, and focused on their everyday realities. It could be implemented in schools, youth gathering places, community settings, and health facilities, using direct discussions, awareness sessions, visual materials, and communication channels accessible to young people.

In conclusion, this study shows that tobacco use among young people in the Mukulua Health Area is a multifactorial phenomenon, involving sociodemographic, social, behavioral, and economic factors. The importance of peer influence, the pursuit of pleasure, stress, the still-positive perception of tobacco among some respondents, and the reported difficulties in quitting are essential elements to consider in local prevention strategies.

The fight against tobacco use among young people should therefore not be limited to providing information about the dangers of tobacco. It should combine health education, strengthening of psychosocial skills, prevention of peer influence, stress management, modification of positive perceptions of tobacco, and smoking-cessation support. Such an integrated approach could help reduce smoking initiation, limit progression toward regular tobacco use, and promote cessation among young people who already smoke.

Finally, despite the importance of these findings, certain limitations should be acknowledged, including the cross-sectional nature of the study, the use of non-probability sampling, and reliance on participants' self-reported information to assess tobacco use. These factors limit the generalizability of the findings and do not allow a definitive causal relationship to be established. Future studies, particularly analytical studies using probability sampling and, where possible, longitudinal studies, could provide a deeper understanding of the factors determining smoking initiation, dependence, and cessation among young people in the Ngaba Health Zone.

Overall, the objectives established for this study were generally achieved, and the hypotheses concerning the existence of associations between tobacco use and certain sociodemographic, social, and behavioral factors are supported by the findings obtained. The proposed health education measures provide a basis that can be adapted and incorporated into prevention activities in the Mukulua Health Area in order to contribute to reducing tobacco use among young people.

Declaration of Originality and Conflict of Interest

We, the authors, declare that this manuscript is an original work and that we have no conflicts of interest with any individual, institution, or organization.

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