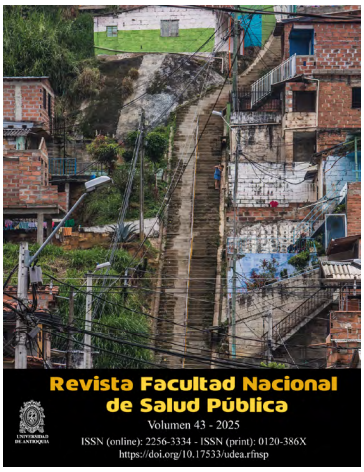

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Medellín, 2016

Factors associated with cigarette smoking in a Peruvian district of high socioeconomic level

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Abstract

Objective: To identify and classify socioeconomic factors associated with cigarette smoking in a high-socioeconomic status Peruvian district.
Methods: A cross-sectional study using data from the 2021–2022 "Health and Determinants Census of the San Borja District" survey, with 49,082 respondents. The entire database that answered the question of whether they smoked cigarettes in the past 12 months was studied. Variables such as cigarette smoking, sex, age, educational level, marital status, employment activity, and others were analyzed. Binary logistic regression and decision tree analyses were performed using an automatic chi-square interaction detector.
Results: The percentage of smokers was 3.70%. Single adults were 1.46 (95% CI: 1.18–1.8) times more likely to smoke. Those living in shared apartments were 1.38 times (95% CI: 1.12-1.70). People without their own home were 2.01 times (95% CI: 1.35-2.95). Men were 2.57 times (95% CI: 2.07-3.19) more likely to smoke than women. The CHAID decision tree showed that, in men, job instability was a main factor; in women, the economic crisis and criminal acts in the home were key factors.
Conclusions: Job instability in men and precarious living conditions in women were associated with cigarette smoking. The main socioeconomic profile of cigarette smokers was being male, not owning their own home, and being single.

--------*Keywords:* cigarette smoking, socioeconomic factors, public health.

Factores asociados al consumo de cigarro en un distrito peruano de nivel socioeconómico alto

Resumen

Objetivo: Identificar y clasificar los factores socioeconómicos asociados al consumo de cigarro en un distrito peruano de nivel socioeconómico alto.
Métodos: Estudio de corte utilizando datos del "Censo de Salud y Determinantes del Distrito de San Borja" de 2021 a 2022, con 49 082 encuestados. Se estudió el total de la base de datos que respondió a la pregunta de si fumaron cigarros los últimos 12 meses. Se analizaron variables como consumo de cigarro, sexo, edad, nivel educativo, estado conyugal, actividad laboral y otros. Se aplicaron análisis de regresión logística binaria y árbol de decisiones por detector automático de interacciones de ji al cuadrado.
Resultados: El porcentaje de fumadores fue de 3,70 %. Los adultos sin pareja fueron 1,46 (IC95%: 1,18-1,8) veces más propensos a fumar. Quienes viven en departamentos compartidos lo fueron 1,38 (IC 95%: 1,12-1,70) veces. Personas sin vivienda propia lo fueron 2,01 (IC95%: 1,35-2,95). Hombres fueron 2,57 (IC95%: 2,07-3,19) veces más propensos a fumar que mujeres. El árbol de decisiones CHAID mostró que, en hombres, la inestabilidad laboral es un factor principal; en mujeres, la crisis económica y hechos delictivos en el hogar fueron factores clave.
Conclusiones: La inestabilidad laboral en hombres y la precarización de las condiciones de vida en mujeres están asociadas al consumo de cigarro. El perfil socioeconómico principal del consumidor de cigarros fue ser hombre, no tener vivienda propia y estar sin pareja.

----------*Palabras clave:* consumo de cigarrillo, factores socioeconómicos, salud pública.

Fatores associados ao consumo de cigarro em um distrito peruano de nível socioeconômico alto

Resumo

Objetivo: Identificar e classificar os fatores socioeconômicos associados ao tabagismo em um distrito peruano de alto nível socioeconômico.
Métodos: Estudo transversal utilizando dados do "Censo de Saúde e Determinantes do Distrito San Borja" de 2021 a 2022, com 49.082 entrevistados. Foi estudado todo o banco de dados que respondeu à pergunta se fumaram cigarros nos últimos 12 meses. Foram analisadas variáveis como consumo de cigarro, sexo, idade, nível educacional, estado civil, atividade laboral, entre outras. Regressão logística binária e análises de árvore de decisão foram aplicadas usando um detector automático de interação qui-quadrado.
Resultados: O percentual de fumantes foi de 3,70%. Adultos solteiros tinham 1,46 (IC 95%: 1,18-1,8) vezes mais probabilidade de fumar. Aqueles que moram em apartamentos compartilhados tinham 1,38 (IC 95%: 1,12-1,70) vezes mais probabilidade. Pessoas sem moradia própria foram 2,01 (IC 95%: 1,35-2,95). Os homens tinham 2,57 (IC 95%: 2,07-3,19) vezes mais probabilidade de fumar do que as mulheres. A árvore de decisão do CHAID mostrou que, nos homens, a instabilidade no emprego é um fator importante; Nas mulheres, a crise econômica e os atos criminosos no lar foram fatores-chave.
Conclusões: A instabilidade no emprego em homens e as condições precárias de vida em mulheres estão associadas ao tabagismo. O principal perfil socioeconômico dos consumidores de cigarros era ser do sexo masculino, não possuir casa própria e ser solteiro.

---------*Palavras-chave*: uso de tabaco, fatores socioeconômicos, saúde pública

Introduction

Cigarette smoking remains a leading cause of morbidity and mortality worldwide, contributing significantly to the burden of chronic disease and premature death [1]. Despite decades of political, health and social health campaigns, millions of people continue to smoke, posing a persistent global public health challenge [2].

Cigarette smoking is mainly driven by the effects of nicotine, a highly addictive substance that alters neurological pathways of pleasure and reward, such as the dopamine pathways, increasing the release of this neurotransmitter and the sensation of pleasure [3]. It also affects the acetylcholine pathway, by acting as a nicotinic agonist [4]; and the glutamatergic pathway, by synaptic plasticity and associative learning [5].

Other components of cigarette smoke, such as tar, cyanide, and carbon monoxide, impair health by causing diseases such as emphysema, chronic obstructive pulmonary disease, diffuse interstitial lung disease, and chronic bronchitis [6]. At the cardiovascular level, cigarette smoking causes narrowing of blood vessels. It also increases oxidative stress and the concentration of cholesterol, lipoproteins, fibrinogen, and platelets [7], generating atheromatous plaques and hemodynamic changes, and increasing the risk of ischemic heart disease, stroke, and myocardial infarction [8]. In addition, secondhand smoke is a significant threat to the health of nonsmokers, especially children, who are more vulnerable to respiratory diseases and other complications [9].

Globally, in 2020, adult smoking prevalence was 32.6% in men and 6.5% in women. It is estimated that 1180 million people smoke regularly, which caused 7 million deaths in 2020 [10]. In Peru, more than 2.5 million people are addicted to tobacco [11] and 15% of people aged 15 or older have smoked at least once. This represents a public health problem, which is exacerbated by cigarette smuggling and the lack of anti-smoking campaigns and policies in school education [12].

Socioeconomic factors influencing cigarette smoking have been investigated in several countries, with varying results. In a study conducted in Sri Lanka, Fernando et al. found that the frequency of cigarette smoking decreased with higher educational level. They also discovered that type of employment, monthly income, influence of friends, low educational level, and age at first exposure to cigarettes were significantly associated with cigarette smoking [13]. In another study in Saudi Arabia, Qattan et al. observed that higher economic income correlated with lower cigarette smoking; and that marital status, gender, age, and region of residence were significantly associated with smoking intensity [14].

Given that cigarette smoking, in addition to having a significant physiological component, is also a socially based problem [15], it is crucial to identify the socioeconomic factors related to this habit in the population of Peru, a country with marked contrasts and differences in human development at both regional and district levels [16]. Districts of high socioeconomic level may have different consumption patterns due to cultural, lifestyle and product access factors.

An understanding and assessment of cigarette consumption would allow public health agencies to a) reveal the link between socioeconomic status and the adoption of risky behaviors; b) design more effective prevention policies and programs specific to the needs of different socioeconomic groups; c) determine the greatest susceptibility to adopt cigarette smoking and target more precise intervention efforts; d) evaluate and adjust future interventions to maximize their impact; e) create more appropriate intervention programs targeted to specific segments of the population that may have resources but still choose harmful habits; f) provide insight into the economic impact of smoking in terms of health costs and labor productivity; and g) find similar patterns in other districts or countries with different socioeconomic characteristics and highlight the need for greater educational efforts and awareness campaigns.

Therefore, the objective of this study was to identify and classify the socioeconomic factors associated with cigarette smoking in a high socioeconomic level Peruvian district.

Study design

A cutoff study, conducted from a secondary database of 50 494 people registered in the "Census of Health and Determinants of the District of San Borja," Peru. The census was conducted by the Integrated Health Network Management of the District of San Borja, from 2021 to 2022 [17]. An alternative census was not designed due to the COVID-19 pandemic.

The population consisted of all people in the District of San Borja, Lima, Peru, who participated in the census. San Borja is a district in the eastern part of metropolitan Lima, with a high human development index of 0.823, based on the methodology proposed by the National Institute of Statistics and Informatics of the United Nations Development Program [18]. The district has approximately 113 000 inhabitants, of whom 105 000 are over 18 years of age [19].

The census design was balanced, stratified, and independently executed by the National Institute of Statistics and Informatics. It consisted of 44 items on health factors and social determinants. There was no sample calculation, as the entire available population was selected from the database, according to the requirements of this study.

All guidelines for studies were followed and derived from health databases [20] to ensure transparency and quality in the management of secondary data obtained from the San Borja population census. These guidelines ensured a clear description of the design, the population studied, and the methods of analysis, which included data cleaning and processing, binary logistic regression, and the Chi Squared Automatic Interaction Detection (CHAID) decision tree.

Variables and measurements

The variables included cigarette consumption (based on smoking in the last 12 months), sex, age group (young, intermediate, and older), educational level, marital status, work activity, family deaths in the last 5 years, household affected by economic crisis or criminal acts, department of origin, presence of disability, type of housing, housing tenure, number of people in the dwelling, and type of apartment.

Data were collected from the census database and processed in Excel® 2016 before being transferred to IBM SPSS Statistics® 25 (subscription license) for analysis. Data corrections and cleaning were performed to ensure consistency and accuracy. Data linkage at the personal and institutional level, or between different databases, was not included.

Statistical analysis

For bivariate descriptive statistics, absolute and relative frequencies were used. For statistical analysis, the binary logistic regression model was used. This combined the Wald method and the exponential of B, which represents the odds ratio, thus allowing a multivariate analysis, with an adjustment for greater statistical precision. The objective was to identify odds ratio (OR) variables associated with cigarette smoking, adjusting it with other predictor variables in the model [21]. This combination helps in understanding how a predictor variable affects the probability of occurrence of an event, after adjusting for the effect of the other predictor variables [22], thus reducing the possibility of confounding biases.

The explanatory variables included the following: type of housing, housing tenure, floor material, age group, educational level, work activity, sex, marital status, family deaths in the last 5 years, household affected by economic crisis or crime, department of origin, presence of disability, number of persons in the dwelling, and body mass index. The response variable was cigarette smoking in the last year.

The model had a value of p less than 0.001 in the omnibus test and a coefficient of Nagelkerke's R^2 determination of 0.41, which explains 41% of the variance of the dependent variable. Likewise, the model had a Hosmer and Lemeshow goodness-of-fit test of 0.947.

Supervised learning was done using the CHAID decision tree to identify complex interactions [23] among multiple socioeconomic variables that could influence cigarette smoking. This allowed us to generate segments and profiles of the population according to their socioeconomic characteristics; to order the variables by their importance in prediction; and to present multilevel interactions for a complete view of how different factors combine to influence smoking behavior.

The use of the CHAID decision tree in this context provides an in-depth understanding of the socioeconomic influences on cigarette smoking. A 10-fold cross-validation was used to estimate the risk of misclassification of the model. The main node of the CHAID tree was the decision on the dichotomous variable "cigarette smoking." The CHAID was developed with the decision tree SPSS 25™ software, from the International Business Machines Corporation®, under subscription. Findings were measured with a significantly lower p value than 0.05 and a 95% confidence interval.

Ethical considerations

Authorization for the use of open data was obtained from the Peruvian Ministry of Health through the National Institute of Health, according to document 001-2023-UDT-OTIC-INS. The database did not include personal identifiable information.

The guidelines of the Declaration of Helsinki were followed [24] with respect to data confidentiality, autonomy to respond or not to the census, and data collection. Supplementary information, including research protocols, is available at [17].

Results

A total of 50 people were surveyed in the San Borja-2022 District Health and Determinants Census. Of these, 47 274 identified as non-smokers and 1808 as smokers. However, 1412 adults did not answer the question on cigarette smoking, leaving a total of 49 082 respondents who answered this specific question. Data quality is adequate, with a response rate of 97.20% for the question on cigarette smoking, indicating a low level of non-response and good representativeness of the population.

Only 3.70% of the population consumed cigarettes. More than half (56.20%) had a high body mass index (equal to or greater than 25), the majority were women (55.20%), 27.50% had gone through higher education (technical/university), 52% of adults were currently single, 61.20% had a stable job, 7% had been affected by economic crises or criminal activity, 14% reported having asked for a family member in the last 5 years, 12.10% originally came from departments other than

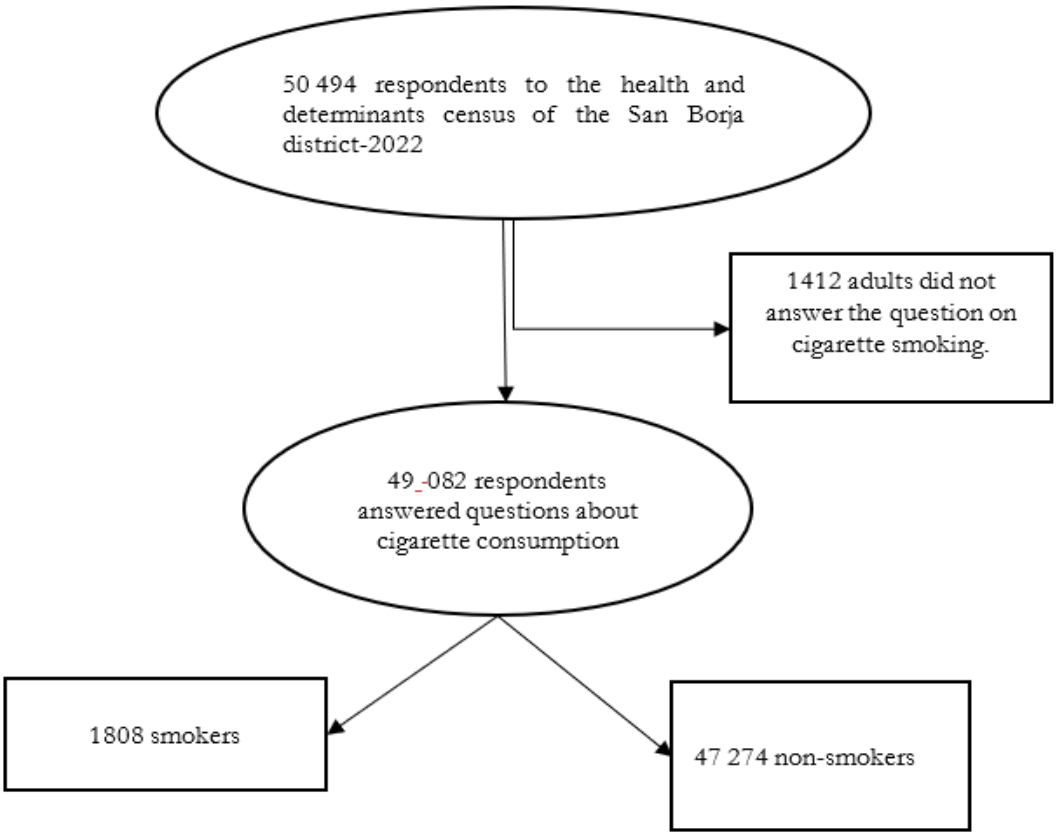

Figure 1. Population selected for the research

Lima, 3.80% had some type of disability, 52% had an independent home, and 85.50% of households had 5 or less members (see Table 1).

In the results of the bivariate analysis on the association of socioeconomic variables with cigarette consumption (see Table 2), it was observed that the statistically significant variables included educational level, where 4.30% and 2.30% of adults who had studied up to secondary school and had tertiary education (technical/university) studies consumed cigarettes, respectively ($p <$ 0.001). According to age group, 3.90% of adults aged 40 or older and 4.70% of adults between 18 and 39 consumed cigarettes ($p < 0.001$). Besides, 4.90% of men and 2.70% of women smoked cigarettes ($p < 0.001$).

According to the type of housing tenure, only 3.70% ($p < 0.001$) of those who owned a home consumed cigarettes while those who had another type of tenure consumed cigarettes, Among those who owned their home and were affected by economic crisis or criminal acts, 5.20% consumed cigarettes, whereas only 3.30% ($p < 0.001$) of those who did not have these traits did. In terms of employment, 4.70% of those in the unemployed group, or those without a permanent job, consumed cigarettes, while only 4.10% in the group with a stable job did ($p = 0.020$).

Multivariate analysis with adjustments found that adults whose current OR marital status was without a partner were 1.46 times more likely to use cigarettes than adults with a partner (OR = 1.461; 95% CI = 1.184–1.803). Adults living in a shared apartment or shared neighborhood were 1.38 times more likely to use cigarettes than adults with a separate household (OR = 1.383; 95% CI = 1.120–1.707). Adults whose type of housing tenure was not their own were 2.01 times more likely to use cigarettes than adults with their own home (OR = 2.010; 95% CI = 1.353–2.954). Likewise, men were 2.574 times more likely to use cigarettes than women (OR = 2.574; 95% CI = 2.078–3.190) (see Table 3).

The CHAID decision tree had a depth of 3 levels, with a total of 20 nodes, of which 11 were terminal nodes. The main characteristics associated with cigarette smoking (node 0) were the following: a) being a male between 18 and 59 years of age, unemployed or without a permanent job (node sequence 17-7-2); and b) being an older adult male with or without a job (node sequence 12-5-1). In women, the main associated characteristics were age 18 to 59, and having a household affected by economic crisis and criminal acts (node sequence 15-6-2) (see Figure 2).

Table 1. Characteristics of the adult population belonging to a high socioeconomic level district, Peru

Characteristics		Frequency	Percentage
Cigarette smoking	Yeah	1808	3.70
	No	47 274	96.30
Body mass index	High	19,794	56.20
	Normal	15,398	43.80
Sex	Man	22 335	44.80
	Women	27,532	55.20
Age group (years)	Young adult (18-39)	12 707	29.26
	Intermediate adult (40-59)	13,842	31.87
	Older adult (≥ 60)	16,879	38.87
Educational level	Technical/university	13 389	27.50
	Up to secondary school	35 224	72.50
Current marital status	Without a partner	24 266	52
	With a partner	22 425	48
Work activity	Unemployed or without a permanent job	12,656	38.80
	Works	19,997	61.20
Loss of a family member in the last 5 years	Yeah	6635	14
	No	40 624	86
Home affected by economic crisis or criminal acts	Yeah	2525	7
	No	33 325	93
Department of origin	Lime	31,559	87.90
	Other departments	4363	12.10
Presence of disability	Physical, mental, visual, hearing or intellectual disability	1829	3.80
	None	46 713	96.20
Type of housing	Department	14 901	47.40
	Detached house	16,552	52.6
Type of housing tenure	Other type of ownership	2463	6.10
	Own	38 117	93.90
Number of people in housing	More than 5	7338	14.50
	5 or less	43 154	85.50
Type of floor	Cement, brick, planking, earth	3717	10.60
	Parquet or polished wood	31,380	89.40

Table 2. Bivariate analysis on the association of socioeconomic variables with cigarette consumption in adults in a high socioeconomic district, Peru, 2021-2022

Variable		Smoker n (%)	Non-smoker n (%)	p
Educational level	Up to secondary school (n = 34,627)	1487 (4.30)	33 140 (95.70)	< 0.001
	Technical/university (n = 13,089)	297 (2.30)	127,928 (97.70)	
Age group (years)	≥ 40	1171 (3.90)	28,959 (96.10)	< 0.001
	18-39	582 (4.70)	11,826 (95.30)	
Type of floor	Cement, brick, decking, earth (n = 3617)	151 (4.20)	3466 (95.80)	0.069
	Parquet or polished wood (30 863)	1104 (3.60)	29,759 (96.40)	
People in housing	More than 5 (7154)	246 (3.40)	6908 (96.60)	0.234
	5 or less (n = 41,928)	1562 (3.70)	40,366 (96.30)	
Sex	Male (n = 21,713)	1059 (4.90)	20,654 (95.10)	< 0.001
	Female (n = 26,879)	730 (2.70)	26 149 (97.30)	
Type of housing tenure	Other type of tenure (n = 2404)	108 (4.50)	2296 (95.50)	< 0.001
	Own (n = 37,449)	1372 (3.70)	36,077 (96.30)	
Type of housing	Department (n = 14,633)	542 (3.70)	14,091 (96.30)	0.077
	Detached house (n = 16,233)	541 (3.30)	15,692 (96.70)	
Presence of disability	Physical, mental, visual, hearing or intellectual disability (n = 1796)	58 (3.20)	1738 (96.80)	0.291
	None (n = 45,927)	1703 (3.70)	44 224 (96.30)	
Department of origin	Lima (n = 30,975)	1177 (3.80)	29,798 (96.20)	0.290
	Other departments (n = 4310)	171 (4)	4139 (96)	
Home affected by economic crisis or criminal acts	Yes (n = 2473)	129 (5.20)	2344 (94.80)	< 0.001
	No (n = 32,749)	1065 (3.30)	31,684 (96.70)	
Family loss last 5 years	Yes (n = 6491)	248 (3.80)	6243 (96.20)	0.524
	No (n = 39,917)	1461 (3.70)	38,456 (96.30)	
Work activity	Unemployed or without a permanent job (n = 19,669)	923 (4.70)	18,746 (95.30)	0.020
	Stable job (n = 12,434)	515 (4.10)	11,919 (95.90)	
Current marital status	Without partner (n = 23,785)	954 (4)	22 831 (96)	0.118
	With partner (n = 21,991)	820 (3.70)	21,171 (96.30)	
Body mass index	High (n = 19,446)	696 (3.60)	18,750 (96.40)	0.122
	Normal (15 117)	589 (3.90)	14,528 (96.10)	

95% CI : 95% confidence interval; n: count; OR: *Odds Ratio* .

Table 3. Bivariate and multivariate analysis with adjusted odds ratio of socioeconomic factors associated with cigarette consumption in a high socioeconomic district, Peru

Variables	Crude OR (95% CI)	p	Adjusted OR (95% CI)	p
Current marital status (without a partner - with a partner)	1,078 (0.981-1.187)	0.118	1,461 (1,184-1,803)	0.010
Housing type: apartment or independent house	1,115 (0.988-1.260)	0.077	1,383 (1,120-1,707)	0.003
Type of housing tenure (other type of tenure - own housing)	1,236 (1,012-1,511)	< 0.001	2,010 (1,353-2,954)	0.001
Sex (men-women)	1,836 (1,666-2,022)	< 0.001	2,574 (2,078-3,190)	< 0.001

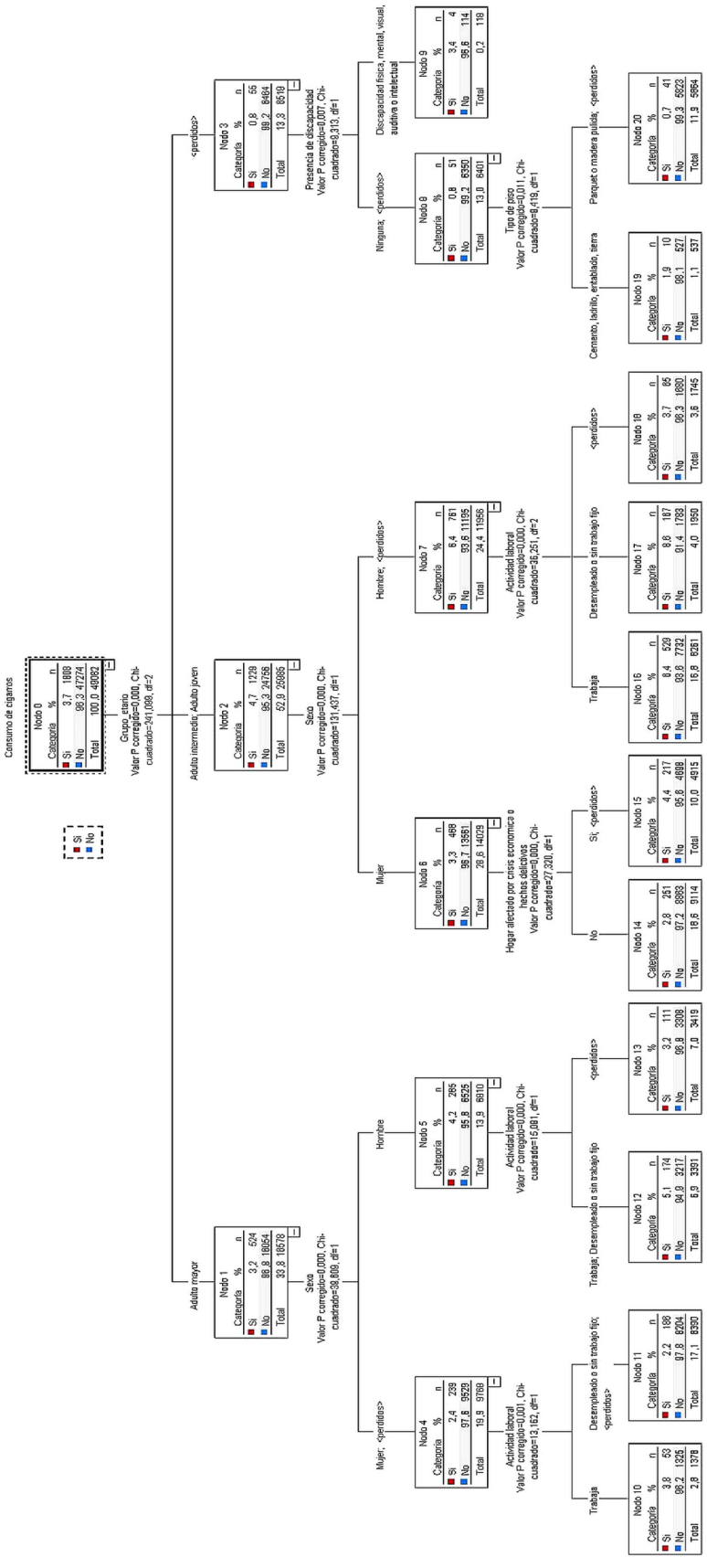

Figura 2. CHAID decision tree for factors associated with cigarette consumption among adults in a high socioeconomic level district, Peru

CHAID decision tree for factors associated with cigarette smoking among adults in a high socioeconomic level district in Peru.

Discussion

The study has shown a relatively low prevalence of cigarette smoking in the district of San Borja, with only 3.70% of the population self-identifying as smokers. This percentage is notably lower than the global estimate, which has a considerably higher prevalence in developing countries: close to 16.80% [25]. This difference may be related to both the high human development index in San Borja and the access to education and health resources of its population. These results indicate that, due to the socioeconomic heterogeneity of the country, it is essential to study the factors associated with cigarette smoking prioritizing levels of development at the district level beyond the categories "urban and rural," as this would allow for a better identification of the causes or aspects related to cigarette smoking in diverse populations exposed to different socioeconomic factors.

In addition, research in countries such as Chile, Vietnam, and the Dominican Republic has shown high prevalences of cigarette smoking in men [26 - 28]. These studies are consistent with the findings of this analysis, where the male gender presented a higher association with cigarette smoking (OR = 2.574; 95% CI = 2.078–3.190). Large epidemiological studies confirm that smoking is more prevalent in men than in women [29]. The reasons behind these differences include psychological, cultural, and physiological factors. For example, it has been found that nicotine stimulates the brain reward centers more intensely in men than in women [30], which supports the idea that men smoke for the stimulant effects of nicotine, whereas women smoke to regulate their mood [31]. Furthermore, these sociocultural and gender factors should be addressed in campaigns for smoking prevention and cessation.

Several global studies have also documented socioeconomic factors that influence tobacco use. For instance, a study in Mexico found that economic insecurity and lack of stable employment increase the likelihood of smoking among young adults [32]. Another study found that, in high-income countries, smoking rates are higher among people with less education and from lower socioeconomic groups [33]. These findings are consistent with the logistic regression analysis of this study, which identified that adults who did not own their house were more likely to smoke (OR = 1.461; 95% CI = 1.184–1.803, and OR = 2.010; 95% CI = 1.353–2.954, respectively).

It was also observed that adults without a partner, those living in shared apartments or neighborhoods, and those who do not own their own home have a greater association with cigarette smoking. In a study of the relationship of smoking with social isolation and loneliness in adults in England, Keir found that smoking is associated with greater social isolation and marital loneliness, especially as smokers age [34]. These results suggest that cigarette smoking is intricately linked to social and economic status and contributes significantly to health inequalities.

The findings are also consistent with the literature suggesting that social and economic instability increases vulnerability to cigarette smoking, which, in turn, increases disease burden, direct medical costs, productivity losses, and time spent providing unpaid care. These increases represent economic losses attributable to cigarette smoking of approximately 1.40% of the combined gross domestic product of several Latin American countries [35]. Given this situation, public health policies should consider these factors when designing specific interventions. Indeed, these should not only include economic sanctions, such as cigarette taxes, but also actions that promote healthy lifestyles and guarantee occupational, social, and economic stability.

The decision tree analysis CHAID helped to define the profiles and joint characteristics that predict groups of adult cigarette users. It revealed, for example, that men between 18 and 59 years of age without job stability have a greater tendency to smoke. It also uncovered that psychosocial stress and economic instability could increase the frequency of smoking. These results coincide with those obtained by Amiri who, in a meta-analysis, found that unemployment increases the likelihood of resorting to alcohol and tobacco use [36], and that cigarette smoking could be a cause of unemployment and job instability. They also match findings by Prochaska et al. who, in a prospective follow-up study of smokers and nonsmokers, found that smokers were less likely to be hired and received lower wages [37]. Therefore, the problem of cigarette smoking involves socioeconomic aspects, such as unemployment or informal and unsatisfactory jobs, that contribute to the adoption or persistence of this habit, and require further improvements in the Peruvian economic and labor system.

In the case of women, although they showed a lower prevalence of cigarette smoking in the analysis, it was observed that the main profile associated with smoking was having a household affected by economic crisis and criminal events. These findings coincide with those obtained in the study by Kim *et al.,* where the prevalence of cigarette smoking was higher in low-income households, especially among adult women with intense stress [38]. The findings may be attributed to the fact that women perceive problems in the household with greater intensity, as they are usually primarily responsible for household care and management of economic resources. Thus, the stress generated by job instability in men and the precariousness of

living conditions at home in women may favor cigarette consumption in these populations.

Limitations of this study are linked to the use of secondary data sources, which limited the inclusion of other variables related to cigarette consumption. They may also include information bias due to possible inaccurate responses in the census, and the lack of information on the frequency of cigarette consumption. Despite follow-up procedures and data cleaning, misclassification on the part of the census developers may have also occurred. On the other hand, as this is a cross-sectional study, longitudinal studies are required to establish causality. Besides, there may be other factors that influence cigarette consumption that were not considered in the study, such as cultural influences, availability of cigarettes, local tobacco control policies, among others. Finally, cigarette consumption patterns may change over time. Therefore, longitudinal studies that explore changes from a temporal context are required.

In conclusion, job instability in men and precarious household living conditions in women are associated with cigarette smoking in a high socioeconomic district in Peru. In addition, the profile confirmed that belonging to the male sex, the absence of one's own housing, and being without a partner are factors that predict a greater propensity to cigarette consumption. The results can contribute to the creation of policies to reduce cigarette consumption, emphasizing the consequences of socioeconomic problems on health, unemployment, economic instability, and citizen insecurity.

Similar studies based on the CHAID decision tree need to be conducted in districts and rural areas with different human development indices, to identify socioeconomic and demographic characteristics which allow for the creation of effective health programs that address all these issues.

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Conflicts of Interest

No conflicts of interest.

Disclaimer

The opinions expressed in this manuscript are the sole responsibility of the author and do not necessarily reflect the views of the institutions to which they belong or the funding source.

Author Contributions

The author developed the proposal, applied the methodological strategy, managed the data, extracted the necessary information and results, and wrote and revised the final manuscript.

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