

Smoking Behavior in Indonesian Society

Henik Tri Rahayu, Amelinda Nur Kartika Rachmah
Universitas Muhammadiyah Malang, Indonesia
Email: trirahayu@umm.ac.id, amelindanur70@gmail.com

ABSTRACT

Smoking is a global health threat, with 22.3% of the world's population using tobacco in 2020, predominantly 36.7% men and a smaller proportion of 7.8% women. More than 80% of global smokers are in low- to middle-income countries, including Indonesia, which in 2007 ranked as the 5th highest smoking population in the world. The objective of this study is to describe people's smoking patterns by gender, as well as to describe demographic characteristics, smoking risk factors, and types of cigarettes in Indonesia using DHS 2017 data. This study employed a cross-sectional quantitative research design with secondary data from DHS 2017. Data were analyzed using SPSS version 23. The Chi-Square test was used to identify differences in the proportion of independent variables by gender, with a significance level of $\alpha = 0.05$. There was a significant difference between males and females in demographic distribution ($p < 0.001$). While the majority of both sexes were non-smokers, there were significant differences in smoking status ($p < 0.001$) and smoking frequency ($p < 0.001$), with a higher proportion of female smokers (3.7%) than men (2.2%). The prevalence of cigarette use ($p < 0.001$) and inhalation through the nose ($p = 0.010$) showed a significant association with sex, although the absolute prevalence was low. There is a relationship between sex and demographic characteristics, smoking risk factors, and types of cigarettes. Therefore, the prevention and control of smoking in Indonesia can consider demographic and gender profiles, focus on conventional cigarettes, and pay attention to differences in tobacco use tendencies.

Keywords: *Gender; Smoke; Demographic characteristics*

This article is licensed under [CC BY-SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/) 

INTRODUCTION

Smoking is an epidemic and a health threat (WHO). In 2020, 22.3% of the total population worldwide used tobacco, including 36.7% of men and 7.8% of women. Of the 1.3 billion tobacco users globally, more than 80% live in countries with low and middle economic levels. The use of tobacco impacts the economic condition of families because smokers prioritize spending on cigarettes instead of fulfilling basic human needs such as food and decent housing. If this condition persists over time, it can result in poverty (Kusuma, Hendarwan, Ahsan, Tjandrawati, Dewi, Marchel, & Manglapy, 2019).

In Indonesia, smoking is a growing problem, and no effective solution has been found to date. According to WHO data from 2011, Indonesia ranked 5th in the world for the highest number of smokers in 2007. Smoking can cause hypertension due to chemicals in tobacco that damage the inner lining of arterial walls, making arteries more susceptible to plaque buildup (atherosclerosis). This is mainly due to nicotine, which stimulates the sympathetic nerves, causing the heart to work harder and blood vessels to narrow, as well as carbon monoxide, which replaces oxygen in the blood and forces the heart to meet the body's oxygen demands.

Tobacco is the single leading cause of preventable deaths (Rosemary et al., 2021; Septiono et al., 2020). Tobacco use in Indonesia has increased significantly over the past three decades due to several factors, including population growth, relatively cheap prices, widespread promotion/marketing by the cigarette industry, and low public awareness about diseases caused by cigarettes.

Infants, children, adolescents, adults, and the elderly can all suffer health problems due to cigarette smoke. When mothers are exposed to cigarette smoke, babies have a 1.128 times higher risk of being born with low birth weight (*berat badan rendah lahir [BBRL]*) compared to babies born to mothers not exposed to smoke (Simamora, 2020). In children, exposure causes increased susceptibility to illnesses such as ear infections, pneumonia, bronchitis, and asthma (Centauri, 2023). Adolescents exposed to cigarette smoke are at risk of acute respiratory infections (ARI) (Sudiarti et al., 2023). Among adults, heavy cigarette smoke exposure increases the risk of coronary heart disease (CHD) by 11.78 times compared to moderate exposure (Anggraini & Hidajah, 2018). Elderly individuals with high exposure to cigarette smoke have a 5.367 times greater risk of developing hypertension compared to those with low exposure (Nopriani & Roza, 2024).

Previous research on smoking behavior in Indonesia has primarily focused on prevalence studies and health impact assessments, with limited attention to gender-specific patterns and comprehensive demographic analysis. Studies by Handayani (2023) examined adult smoking habits using GATS 2021 data but focused mainly on general prevalence rather than detailed gender comparisons. Research by Kosen et al. (2017) analyzed health and economic costs but did not provide a comprehensive gender-stratified analysis of smoking patterns and associated demographic factors. International studies have shown varying smoking patterns between genders, but Indonesian-specific research using nationally representative data like DHS has been limited in scope and depth.

The research gap specifically lies in the absence of comprehensive gender-stratified analysis of smoking behaviors using large-scale national survey data in Indonesia. While previous studies have documented prevalence and health impacts, limited research systematically examines how demographic characteristics, risk factors, and tobacco product preferences differ between men and women in the Indonesian context. This gap is particularly significant given Indonesia's unique position in global tobacco consumption patterns.

The novelty of this research lies in its comprehensive approach to examining gender-specific smoking behavior using the nationally representative DHS 2017 dataset, providing detailed analysis of demographic correlates, risk factors, and tobacco product preferences stratified by gender. Unlike previous studies focusing on general prevalence or specific health outcomes, this research offers a holistic view of how smoking behaviors manifest differently across genders within various demographic contexts in Indonesia.

The research problem addressed in this study fills the critical gap in understanding gender-specific smoking patterns and their demographic correlates in Indonesia. While global smoking statistics provide broad insights, insufficient comprehensive analysis exists on how smoking behaviors differ across genders within the Indonesian context, especially when examining demographic characteristics, risk factors, and tobacco product preferences using nationally representative data.

The urgency of this research stems from Indonesia's alarming position as the world's fifth-largest smoking nation, combined with unique tobacco consumption patterns that differ from global trends. With over 80% of smokers residing in low- to middle-income countries like Indonesia, immediate evidence-based insights are needed to inform targeted public health interventions. The economic burden of tobacco use on Indonesian families—who prioritize

cigarette purchases over necessities—demands urgent attention to prevent long-term poverty cycles and improve population health outcomes.

The benefits of this research include providing evidence-based insights for developing gender-specific tobacco control interventions, informing public health policymakers about demographic factors influencing smoking behaviors, contributing to the global understanding of smoking patterns in developing countries, and supporting the development of targeted prevention and cessation programs. The practical implications extend to healthcare providers, policymakers, and community health organizations striving to implement effective tobacco control strategies tailored to Indonesian demographic contexts.

Based on this background, this study aims to describe smoking patterns by gender, as well as demographic characteristics, smoking risk factors, and types of cigarettes in Indonesia using DHS 2017 data.

METHOD

This study analyzed the relationship between various categorical variables using data from the 2017 Indonesian Demographic and Health Survey (SDKI), also known as the 2017 Demographic and Health Survey (DHS). The analysis focused on identifying differences in proportions between groups using Chi-Square statistical tests. A quantitative research design with a cross-sectional approach was employed to examine relationships between variables at a single point in time and identify differences in proportions within the population.

Secondary data from the 2017 SDKI/DHS were obtained through an application and approval process from The DHS Program. The dependent variable was gender, while the independent variables were grouped into three categories: 1) demographic characteristics, 2) risk factors, and 3) type of smoking. Data analysis was performed using SPSS version 23.

The study was based on nationally representative data collected by the 2017 DHS, which used a carefully designed sampling methodology to ensure representation of the entire Indonesian population. From the DHS dataset, relevant subsets were selected according to the study focus and criteria.

RESULTS AND DISCUSSION

Table 1 Demographic Characteristics

Demographic Characteristics	Male (n), %	Female (n), %	P-value
Age			
- Adolescents	6,812 (15.74)	1,124 (17.70)	X ² : 15.840 df : 1 p-value : 0.000
- Adult	36,465 (84.25)	5,226 (82.29)	
Residence			
- Urban	22,626 (52.3)	3,799 (59.8)	X ² : 126.626 df : 1 p-value : 0.000
- Rural	20,651 (47.7)	2,551 (40.2)	
Marital status			
- Never married	10,272 (23.7)	2,429 (38.3)	X ² : 612,777 df : 1 p-value : 0.000
- Married	33,005 (76.3)	3,921 (61.7)	
Education			
- Primary	35,701 (82.5)	4,802 (75.6)	X ² : 174.284 df : 1 p-value : 0.000
- Secondary	7,576 (17.5)	1,548 (24.4)	
Income			
- Low income	25,827 (59.7)	4,135 (65.1)	X ² : 68.493 df : 1 p-value : 0.000
- High income	17,450 (40.3)	2,215 (34.9)	
Work			
- Not working	17,756 (41.1)	2,183 (34.5)	X ² : 100.816 df : 1 p-value : 0.000
- Working	25,457 (58.9)	4,151 (65.5)	

In table 1, the majority of male (84.25%) and female (82.29%) respondents are in the adult age group. There was a statistically significant difference between the age distributions of men and women (X²: 15,840, df: 1, p-value: 0.000). Most men (52.3%) live in urban areas, while the proportion of women living in urban areas is slightly higher (59.8%). This difference is very significant (X²: 126.626, df: 1, p-value: 0.000). The majority of male (76.3%) and female (61.7%) respondents were married. The difference in marital status between the two sexes was significant (X²: 612,777, df: 1, p-value: 0.000). Most of the respondents, both male (82.5%) and female (75.6%), had a basic level of education. This difference is significant (X²: 174.284, df: 1, p-value: 0.000). The majority of male (59.7%) and female (65.1%) respondents were in the low-income category. There was a significant difference in the income distribution between men and women (X²: 68,493, df: 1, p-value: 0.000). Most of the respondents, both men (58.9%) and women (65.5%), have working status. The difference in employment status between the two sexes was significant (X²: 100.816, df: 1, p value: 0.000).

Table 2 Risk Factors for Smoking

Factor risk	Man n (%)	Woman n (%)	p-value
Smoke			
- No	42355 (97.9)	6113 (96.3)	X ² : 62.293 df : 1 p-value : 0.000
- Yes	922 (2.2)	237 (3.7)	
Frequency of smoking			
- Never smoker			X ² : 60.584 df : 1 p-value : 0.000
- Current smoker	42395 (98.0) 869 (2.0)	6122 (96.4) 225 (3.5)	

In table 2, the majority of male (97.9%) and female (96.3%) respondents did not smoke. However, the proportion of men who smoke (2.2%) is lower than that of women who smoke (3.7%). There was a statistically significant difference in smoking status between men and women (X^2 : 62,293, df: 1, p-value: 0.000). Almost all male (98.0%) and female (96.4%) respondents were 'never smokers'. However, the proportion of 'current smokers' in women (3.5%) is higher than that of men (2.0%). This difference in smoking frequency is significant (X^2 : 60.584, df: 1, p-value: 0.000).

Table 3 Types of Cigarettes

Types of cigarettes	Male n (%)	Woman n (%)	p-value
Smokes pipe full of tobacco			
- No	43,258 (99.9)	6,345 (1.0)	X^2 :0.147 df :1 p-value : 0.702
- Yes	1 (2.31)	0 (0.0)	
Smokes cigarettes			
- No	42,395 (98.0)	6,122 (96.4)	X^2 :60.584 df : 1 p-value : 0.000
- Yes	869 (0.2)	225 (0.3)	
Chews tobacco			
- No	43,217 (99.9)	6,339 (99.9)	X^2 : 0.004 df : 1 p-value : 0.952
- Yes	42 (0.0)	6 (0.0)	
Inhaled through nose			
- No	43,253 (99.9)	6,341 (99.9)	X^2 : 6.638 df : 1 p-value : 0.010
- Yes	6 (0.0)	4 (0.0)	
Cigars			
- No	43,256 (99.9)	6,345 (1)	X^2 : 0.440 df : 1 p-value : 0.507
- Yes	3 (0.0)	0 (0.0)	
Electronic cigarillos			
- No	43,250 (99.9)	6,344 (99.9)	X^2 : 0.070 df : 1 p-value : 0.792
- Yes	9 (0.0)	1 (0.0)	
Shisha/ water pipe			
- No	43,244 (99.9)	6,341 (99.9)	X^2 :1.163 df : 1 p-value : 0.281
- Yes	15 (0.0)	4 (0.0)	

In table 3, the results of the analysis show that the prevalence of use of most tobacco products other than conventional cigarettes (clove cigarettes) is very low, close to 0% in both sexes. No statistically significant relationship was found between sex and the use of pipe cigarettes (p-value = 0.702), chewed tobacco (p-value = 0.952), cigars (p-value: 0.507), e-cigarettes (p-value: 0.792), or Shisha/Water Pipes (p-value: 0.281). This indicates that gender does not affect the probability of using the type of tobacco product. However, the type of cigarettes showed a difference, although the percentage of smokers was absolutely low (males 0.2%, females 0.3%) there was a very statistically significant relationship between sex and cigarette use (p-value < 0.001). In addition, although the prevalence is also very low, the use of inhaled through nose tobacco shows a statistically significant relationship with sex (p-value = 0.010), indicating a difference in the tendency to use this type of tobacco by gender.

Discussions

Based on the data analysis, a striking and statistically significant demographic profile emerges between genders in Indonesia. The study reveals significant differences across all demographic variables examined—age, residence, marital status, education, income, and work status. A higher proportion of women resided in urban areas (59.8% vs. 52.3% of men) and fell into the low-income category (65.1% vs. 59.7%), while a smaller proportion of women were married (61.7% vs. 76.3%) and a larger proportion were working (65.5% vs. 58.9%). These foundational demographic disparities are crucial as they establish the distinct socio-economic contexts within which smoking behaviors manifest differently for men and women, suggesting that tobacco use cannot be divorced from these broader societal factors.

The most pivotal finding of this research, which challenges the prevailing global and national narrative, is the significant difference in smoking prevalence between genders. Contrary to the common understanding that smoking is overwhelmingly male-dominated, this study found a higher proportion of female smokers (3.7%) compared to males (2.2%), a difference that was also reflected in the frequency of current smokers. This inversion of the expected pattern, confirmed by a strong Chi-Square significance ($p < 0.001$), forces a critical re-evaluation of targeted public health strategies. It indicates that Indonesian women are not a negligible demographic in smoking epidemiology and may face unique, under-researched pressures or motivations for tobacco use that are obscured by aggregate national data.

When interpreting these surprising results on smoking prevalence, the demographic context becomes essential (Kodriati & Rosemary, 2025). The higher proportion of women in urban settings and low-income brackets may point to specific stress factors or cultural shifts in cities that make women more susceptible to smoking initiation. Furthermore, the fact that a larger percentage of women are working could indicate increased financial independence, potentially facilitating access to tobacco products, or conversely, higher stress levels acting as a catalyst for smoking. The lower marriage rate among women in the sample might also suggest differing social norms or peer influences among unmarried women. Therefore, the smoking behavior cannot be interpreted in isolation but must be seen as intertwined with these complex demographic and socioeconomic variables (Hardesty et al., 2019; Kusuma, Hendarwan, Ahsan, Adrison, Cohen, & Art, 2020).

Regarding the types of tobacco products, the data clearly indicates that conventional cigarettes are the predominant form of consumption for both genders who smoke, with other forms like pipes, cigars, e-cigarettes, and shisha showing negligible and statistically insignificant usage. The significant association ($p < 0.001$) between gender and cigarette use, despite low absolute percentages, reinforces the primary finding that gender is a key differentiating factor in smoking behavior. The significant finding for tobacco inhaled through the nose ($p=0.010$) further suggests there are subtle, gender-specific preferences in consumption methods that, while rare, warrant attention as they may indicate emerging trends or deeply cultural practices.

This study's finding of a higher female smoking prevalence contrasts sharply with previous research, such as the WHO (2020) report citing global male smoking rates of 36.7% compared to 7.8% for females, and national studies like Handayani (2023) which used GATS 2021 data and typically focus on much higher male prevalence. This discrepancy highlights a critical limitation of relying solely on broad prevalence studies; they can mask important

subgroup variations. Our findings, using the detailed DHS 2017 dataset, suggest that within the larger context of overall smoking rates, there are specific cohorts where female smoking is a significant and concerning issue, a nuance that is often lost in higher-level reports (Fithria et al., 2021).

The practical implications of these findings are substantial for public health policy in Indonesia. Tobacco control programs must urgently move beyond a one-size-fits-all approach and develop gender-specific interventions. Campaigns targeting women should be designed with an understanding of their specific demographic profiles—addressing stressors related to urban living, low income, and workforce participation. Public health messaging for women needs to be culturally sensitive and disseminated through channels most accessible to them, potentially focusing on the intersection of smoking with economic well-being and family health, rather than solely on health risks (Ayuningtyas et al., 2021).

From a policy perspective, this research underscores the necessity of integrating stringent tobacco control measures with broader social and economic policies aimed at improving the determinants of health. Solutions should include strengthening the enforcement of advertising bans that particularly target vulnerable demographics, implementing gender-sensitive smoking cessation services in urban primary health care centers and workplaces, and launching counter-marketing campaigns that de-glamorize smoking among women. Increasing taxes on tobacco products remains a proven effective policy, but its impact on low-income populations, where female smoking appears higher, must be mitigated through supportive cessation programs.

In conclusion, the discussion affirms that smoking behavior in Indonesia is a complex issue profoundly mediated by gender and demographic factors. The key takeaway is the urgent need to dismantle the assumption of smoking as a primarily male behavior and to recognize the distinct vulnerability of certain female demographics. Future research should employ qualitative methods to deeply explore the motivations behind smoking initiation and persistence among Indonesian women (Ahsan et al., 2020). The practical implication for national strategy is clear: enhancing the effectiveness of tobacco control mandates a tailored, multi-sectoral approach that addresses the unique socio-economic drivers of smoking for both men and women, with a renewed and immediate focus on preventing a rise in female tobacco use (Ayuningtyas et al., 2021).

CONCLUSION

The study reveals significant demographic differences between men and women in Indonesia regarding smoking behavior, including age, residence, marital status, education, income, and employment, with women exhibiting a higher smoking prevalence (3.7%) than men (2.2%). While most Indonesians are non-smokers, conventional cigarettes remain the predominant tobacco product, often inhaled nasally, though this method is relatively uncommon. These findings underline the need for smoking prevention and control efforts to be tailored by gender and demographic profiles, focusing primarily on conventional cigarette use and the gender-specific tendency towards nasal inhalation. Future research should explore the underlying cultural, social, and psychological factors driving gender differences in smoking patterns and nasal inhalation practices, as well as evaluate the effectiveness of gender- and demographically tailored tobacco control interventions to inform more inclusive and effective public health strategies in Indonesia.

REFERENCES

- Anggraini, D. &. (2018). Hubungan antara paparan asap rokok dan pola makan dengan kejadian penyakit jantung koroner pada perempuan usia produktif. *Nutrisi Amerta*, 2 (1), 10-16.
- Centauri, C. (2023). Rokok dan Dampaknya pada Kesehatan Anak. From <https://rs.ui.ac.id/umum/berita-artikel/artikel-populer/rokok-dan-dampaknya-pada-kesehatan-anak>.
- Handayani, L. (2023). Gambaran Kebiasaan Merokok Pada Usia Dewasa Di Indonesia : Temuan Hasil Global Adult Tobacco Survey (Gats) 2021. *Jurnal WINS Vol. 3 No. 4*, 193-198.
- Imelda Erman, H. D. (2021). Hubungan Merokok Dengan Kejadian Hipertensi Di Puskesmas Kampus Palembang. *Jurnal Keperawatan Merdeka (JKM)*, Volume 1 Nomor 1, 54-61.
- Kosen, S. d. (2017). *Health and Economics Costs of Tobacco in indonesia : Review of Evidence Series*. Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan (LPB), Jakarta .
- Neni Kusuma Wardani, S. W. (2016). Hubungan Antara Paparan Asap Rokok Dengan Kejadian Infeksi Saluran Pernapasan Akut (Ispa) Pada Balita Di Desa Pucung Rejo Kabupaten Magelang Tahun 2014. *Jurnal Kebidanan Vol.5 No.10*, 30-37.
- Nopriani, Y. &. (2024). Hubungan paparan asap hipertensi pada lansia. 5, 2225-2232.
- Organization, W. H. (2022). Tobacco. From <https://www.who.int/news-room/fact/sheets/detail/tobacco>.
- Simamora, S. E. (2020). Hubungan paparan asap rokok dari suami pada waita usia 15-57 tahun dengan kejadian bayi berat lahir rendah di indonesia (Analisis data lanjutan Ifls-5 tahun 2014). *Jurnal kesehatan reproduksi*, 11(1), 89-100.
- Sudiarti, P. E. (2023). Hubungan Paparan Asap Rokok dengan Kejadian Ispa Pada Remaja di Sman 1 Kampar. *Jurnal Ners*, 7(1), 753-756.
- Yora Nopriani, S. R. (2024). Hubungan Paparan Asap Rokok Dengan Kejadian Hipertensi Pada Lansia. *Jurnal Kesehatan Tambusai Volume 5, Nomor 1*, 2225-2232.