Determinants of Smoking Initiation and Cessation in Populations with a Heavy Smoking History; Conceptual Framework

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Information of Article	ABSTRACT
	This paper presents a conceptual framework for understanding the determinants of smoking initiation and cessation among populations with a heavy smoking history. Smoking remains a significant global health concern, with adverse impacts on respiratory health and overall well-being. The proposed framework integrates socio-demographic factors, such as age, gender, education, and socioeconomic status, with knowledge of respiratory diseases and awareness of pulmonary function risks to identify key drivers of smoking behaviors. It emphasizes how these determinants interact to influence the initiation of smoking, sustain smoking habits, and affect the likelihood of cessation. The framework also addresses critical barriers to cessation, including health literacy gaps, cultural influences, and access to healthcare services, particularly in populations with long-term smoking habits. By highlighting the role of awareness about respiratory health risks, such as chronic obstructive pulmonary disease (COPD) and lung cancer, the study underscores the importance of targeted interventions and education campaigns in promoting cessation and preventing initiation. This conceptual model provides a foundation for designing evidence-based strategies that enhance smoking prevention and cessation programs. It aims to guide public health initiatives and inform policy decisions by offering insights into the multifaceted nature of smoking behavior. The framework serves as a starting point for future empirical research, with the ultimate goal of reducing the burden of smoking-related diseases and improving health outcomes in vulnerable populations.

1. Introduction

Smoking remains a leading global health challenge, contributing significantly to the burden of chronic diseases such as chronic obstructive pulmonary disease (COPD), lung cancer, and cardiovascular conditions. Despite decades of public health initiatives, smoking prevalence persists, with high rates particularly evident in specific demographic groups and regions. For instance, Malaysia has observed persistent challenges in smoking cessation and initiation, with studies underscoring socio-demographic disparities in smoking behaviors and attitudes (Ahmad & Ng, 2022; Al Khathlan et al., 2021). The adverse effects of smoking extend beyond individual smokers to those exposed to secondhand smoke, compounding the societal health impact. Albasheer et al. (2023) emphasized the importance of addressing secondhand smoke, which remains prevalent in many Malaysian households despite widespread awareness campaigns. The interplay between socio-economic factors, cultural norms, and health literacy levels contributes to the persistence of smoking behaviors, as highlighted by Amalia et al. (2019) in their analysis of smoking inequalities in Southeast Asia.

Addressing the multifaceted nature of smoking behaviors requires a robust theoretical foundation. The Theory of Planned Behavior (TPB) (Ajzen, 1991) provides a framework for understanding how attitudes, subjective norms, and perceived behavioral control influence smoking initiation and cessation. TPB has been extensively validated as a predictive tool for health-related behaviors, including smoking cessation. Furthermore, Bandura's Social Cognitive Theory (1986) emphasizes

the role of social modeling and self-efficacy, which are critical for understanding how social influences and individual capacities shape smoking habits. In addition to individual-level factors, environmental exposures and socio-economic disparities play a pivotal role in smoking initiation and cessation. For instance, Amoabeng et al. (2020) found that occupational and environmental exposures exacerbate respiratory health risks, emphasizing the need for targeted public health interventions in vulnerable populations.

This paper aims to develop a conceptual framework for understanding the determinants of smoking initiation and cessation, particularly in populations with a heavy smoking history. By integrating socio-demographic factors, health literacy, and environmental risks, the framework seeks to inform evidence-based interventions and policies. This work builds on prior studies that highlight the critical importance of socio-cultural and behavioral factors in shaping smoking behaviors (Akintunde et al., 2021; Andersen et al., 2022).

2. Theoretical Foundations

Smoking behavior is influenced by an interplay of psychological, social, and environmental factors. To effectively address smoking initiation and cessation, a robust theoretical foundation is required. This section elaborates on three key frameworks: the TPB, Social Cognitive Theory (SCT), and socio-environmental perspectives. These theories provide a multidimensional understanding of the factors that drive smoking behavior and inform targeted interventions.

2.1 The Theory of Planned Behavior

The Theory of Planned Behavior, introduced by Ajzen (1991), is a widely used framework for predicting and understanding health-related behaviors, including smoking. The TPB posits that behavior is determined by three core constructs: attitudes, subjective norms, and perceived behavioral control (PBC). Attitudes refer to an individual's evaluation of smoking behaviors, encompassing both perceived benefits (e.g., stress relief) and risks (e.g., health complications). Subjective norms are shaped by social pressures and cultural expectations, influencing an individual's perception of what is socially acceptable. PBC, the final component, reflects the extent to which an individual believes they can control their smoking behavior, including the ability to quit. In the context of smoking cessation, TPB highlights how individuals are more likely to attempt quitting if they develop strong negative attitudes toward smoking, feel social support from their environment, and perceive high self-control. For instance, Ahmad and Ng (2022) found that subjective norms surrounding Malaysia's smoking ban in eateries were instrumental in shifting attitudes among adult smokers, though enforcement and cultural factors influenced the effectiveness of this policy. Similarly, Chen et al. (2021) demonstrated that interventions focused on improving PBC, such as personalized counseling and nicotine replacement therapy, significantly increase cessation rates. By addressing these constructs, TPB serves as a valuable guide for designing interventions that target cognitive and motivational factors driving smoking behaviors.

2.2 Social Cognitive Theory

Social Cognitive Theory (SCT), developed by Bandura (1986), provides a comprehensive understanding of the reciprocal interactions between personal, environmental, and behavioral factors. A core element of SCT is self-efficacy, or an individual's confidence in their ability to perform a specific behavior, such as quitting smoking. High self-efficacy is associated with a greater likelihood of attempting and maintaining smoking cessation. Observational learning is another critical aspect of SCT, emphasizing how individuals are influenced by witnessing the behavior and outcomes of others, such as peers or role models who successfully quit smoking. Reinforcement mechanisms, including rewards for cessation or penalties for continued smoking, further shape behavior. In applying SCT to smoking cessation, the theory recognizes that individual behavior does not occur in isolation but is influenced by social and environmental contexts. For instance, Amoabeng et al. (2020) highlighted the role of workplace exposures and peer influences in sustaining smoking behaviors among vulnerable populations. In these environments, smoking is often normalized, reducing motivation to quit. Interventions informed by SCT aim to counteract these influences by creating supportive social networks and reinforcing positive behaviors. For example, community-based cessation programs that leverage peer support and motivational rewards have been shown to enhance self-efficacy and reduce relapse rates. SCT's holistic approach underscores the importance of addressing both individual and contextual factors to facilitate successful smoking cessation.

2.3 Socio-Environmental Perspectives

Smoking behaviors are also deeply embedded within socio-environmental contexts, including socio-demographic characteristics, cultural norms, and environmental exposures. Socio-demographic factors such as education, income, and occupation significantly influence smoking prevalence and cessation patterns. Individuals with lower levels of education and income often face greater challenges in quitting smoking due to limited access to healthcare resources, lack of awareness about smoking risks, and heightened exposure to smoking-promoting environments. Almutairi et al. (2020) found that individuals with robust social support networks are more likely to quit smoking, whereas those in socio-economically disadvantaged settings face compounded barriers. Environmental factors, such as exposure to secondhand smoke and other pollutants, further exacerbate smoking-related risks. For example, Al Khathlan et al. (2021) reported that prolonged exposure to incense smoke in Saudi Arabia led to respiratory symptoms similar to those caused by tobacco smoke, emphasizing the interconnectedness of environmental and behavioral health risks. Andersen et al. (2022) highlighted how stressors during the COVID-19 pandemic, such as financial insecurity and limited access to cessation resources, influenced smoking behaviors, particularly among vulnerable populations. These findings underscore the need for

interventions that address environmental and structural determinants, such as reducing workplace exposures and ensuring equitable access to cessation programs.

2.4 Integration of Frameworks

The integration of TPB, SCT, and socio-environmental perspectives offers a comprehensive lens for understanding the complex drivers of smoking behavior. TPB provides insights into the cognitive and motivational aspects of smoking, highlighting the role of attitudes, norms, and self-control. SCT complements this by addressing the influence of social dynamics and individual capacity for behavioral change through self-efficacy and observational learning. Socio-environmental perspectives broaden the focus to include systemic and contextual factors, such as cultural norms and access to resources. This integrated approach forms the foundation for the conceptual framework proposed in this study, which aims to identify the determinants of smoking initiation and cessation in populations with a heavy smoking history. By combining these theories, the framework seeks to inform the design of holistic interventions that target individual, social, and environmental factors. Such interventions are critical for addressing the persistent burden of smoking-related diseases and improving public health outcomes in high-risk populations.

3. Gap in the Literature

The literature on smoking behavior in Malaysia offers valuable insights but reveals significant gaps that limit the development of effective interventions. These gaps include insufficient studies on socio-demographic interactions, limited evaluation of educational programs' effectiveness, and a lack of longitudinal research on the long-term impact of cessation efforts. While socio-demographic factors like age, gender, income, and education significantly influence smoking behavior (Hiscock et al., 2020), their specific interplay within Malaysia's multi-ethnic context remains underexplored. Cultural norms and practices vary across Malay, Chinese, and Indian communities, impacting smoking prevalence and cessation rates (Nguyen et al., 2021). Additionally, data on how income and education affect smoking within these diverse groups is sparse. Understanding these dynamics is essential for creating culturally sensitive and socio-economically appropriate interventions (Dobbie et al., 2020).

4. Conceptual Framework Development

The research framework for this study builds upon the limitations and gaps identified in prior research to offer a more comprehensive understanding of the relationships between socio-demographic factors, knowledge of respiratory diseases, pulmonary function risks, and smoking behaviors (initiation and cessation). While previous studies have investigated some of these variables individually, few have integrated them into a cohesive framework that captures their combined and interdependent effects. This integrated approach not only provides a holistic view of the factors influencing smoking behaviors but also addresses specific limitations of earlier

studies, such as narrow focus, lack of generalizability, and insufficient exploration of mediating and moderating effects.

Unlike prior research, which often focuses solely on one aspect such as socio-demographic factors or health knowledge this study systematically examines how these variables interact to shape smoking behaviors. For instance, while earlier studies have identified socio-demographic disparities in smoking rates, they often fail to explore how these disparities intersect with knowledge about respiratory diseases or perceptions of pulmonary risks (Elsaihi et al., 2023; Jamil et al., 2020). This study bridges that gap by investigating the mediating role of knowledge and the moderating influence of socio-demographic factors, offering insights into why certain populations are more vulnerable to smoking initiation or face greater challenges in cessation.

Additionally, this research leverages a quantitative approach using a structured questionnaire, which allows for the measurement of these variables on a large scale with statistical precision. Unlike qualitative or mixed-methods studies that may lack generalizability, this study's design ensures robust, replicable findings applicable to diverse populations in the Klang Valley, Malaysia. The inclusion of underexplored factors such as pulmonary function risks also sets this study apart, as previous research has largely overlooked their direct and indirect effects on smoking behaviors (Sarwar et al., 2021). By focusing on both smoking initiation and cessation, the study provides actionable insights for public health interventions. Previous studies often address these outcomes separately, resulting in fragmented strategies for prevention and treatment. This study integrates both dimensions, enabling the development of comprehensive policies that simultaneously reduce smoking uptake and support cessation efforts.
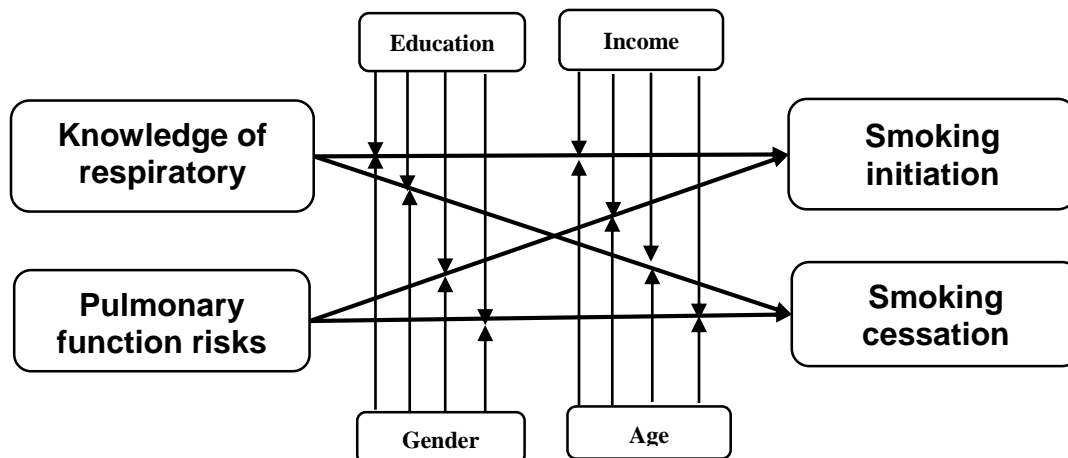

Figure 1. Conceptual framework Module

The proposed research framework (Figure 2.2) not only addresses the shortcomings of earlier studies but also advances the field by providing a well-rounded, evidence-based model that links key determinants of smoking behaviors. This approach ensures that the findings are not only theoretically robust but also practically relevant, offering significant contributions to public health strategies aimed at reducing smoking prevalence and promoting cessation.

5. Practical Implications

The findings of this study offer significant practical implications for public health strategies aimed at reducing smoking prevalence and improving cessation outcomes. These implications can guide interventions, policy-making, and healthcare practices to address smoking behavior effectively in diverse and high-risk populations. Addressing socio-demographic disparities is critical for effective smoking prevention and cessation efforts. The study highlights the need for tailored programs that reflect the unique cultural, social, and economic contexts of Malaysia's multi-ethnic society. For instance, interventions for Malay, Chinese, and Indian communities should consider cultural norms and smoking-related practices specific to each group (Nguyen et al., 2021). Similarly, gender-specific programs are essential, as men often face peer pressure to conform to masculine smoking norms, while women may encounter unique barriers such as stigma and weight-related concerns (Amalia et al., 2019; McKee et al., 2020). By customizing interventions to meet the needs of different demographic groups, public health initiatives can better address the underlying factors driving smoking initiation and cessation challenges (Dobbie et al., 2020).

Tobacco control policies remain a cornerstone of smoking prevention strategies. This study supports strengthening existing measures, such as increasing tobacco taxes, enforcing public smoking bans, and restricting tobacco advertising (Levy et al., 2020). However, local research is necessary to evaluate the effectiveness of these policies in the Malaysian context. For example, studies could assess the impact of higher tobacco taxes on smoking rates among low-income groups or the role of public smoking bans in reducing secondhand smoke exposure (Coady et al., 2019). Policymakers should also address challenges in enforcement, particularly in rural areas, where regulations may be harder to implement. Evidence-based policy adjustments can ensure sustained reductions in smoking prevalence (Lim et al., 2021). Healthcare providers are key stakeholders in supporting smoking cessation. However, the study highlights barriers such as insufficient training, time constraints, and lack of access to cessation resources. Addressing these gaps requires standardized training programs that equip providers with the skills and knowledge needed to offer effective smoking cessation counseling (Rigotti et al., 2020). Providers should be encouraged to adopt evidence-based approaches, such as motivational interviewing and behavioral therapy (Fiore et al., 2020). Ensuring access to nicotine replacement therapies (NRT) and cessation aids in clinical settings will further enhance their ability to support patients. Incorporating cessation protocols into routine care can ensure consistent delivery of support across healthcare

Psychological factors such as stress, anxiety, and coping mechanisms play a significant role in smoking behavior. The study highlights the importance of integrating psychological interventions, such as cognitive-behavioral therapy and mindfulness-based stress reduction (MBSR), into cessation programs. These approaches can help individuals manage triggers for smoking and develop healthier coping strategies (Gwaltney et al., 2020). Tailoring psychological support to high-risk groups, such as heavy smokers or those with co-occurring mental health conditions, is

essential for improving quit success rates. Incorporating these methods into comprehensive cessation programs ensures a more holistic approach to addressing the complexities of smoking behavior (Chen et al., 2021).

6. Conclusion

Smoking remains a significant public health challenge, contributing to the global burden of chronic diseases, particularly in populations with a history of heavy smoking. This study provides a comprehensive framework that integrates socio-demographic factors, knowledge of respiratory diseases, and awareness of pulmonary function risks to better understand the determinants of smoking initiation and cessation. By exploring these variables in the context of Malaysia's diverse socio-cultural landscape, the research sheds light on the interplay of individual, social, and systemic factors influencing smoking behaviors.

Future research should build on this foundation by exploring the longitudinal impacts of interventions, evaluating the effectiveness of digital tools, and examining underexplored variables such as environmental and occupational factors. Such efforts will further refine strategies for combating smoking in Malaysia and similar settings, ultimately contributing to improved health outcomes in vulnerable populations.

7. References

Ahmad, K., & Ng, C. (2022). Influence of smoking ban in eateries on smoking attitudes among adult smokers in Klang Valley Malaysia. Malaysian Journal of Public Health Medicine.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179-211.

Akintunde, M. O., Olawale, A. O., Amusan, A. S., & Abdul Azeez, A. I. (2021). Comparing Two Classical Methods of Detecting Multicollinearity in Financial and Economic Time Series Data. International Journal of Applied Mathematics and Theoretical Physics.

Al Khathlan, N., Al-dabbus, Z., Al-khdir, N., Al-Matar, M., Al-Nusaif, S., & Al Yami, B. (2021). Incense (bakhour) smoke exposure is associated with respiratory symptoms and impaired lung function among adults: A cross-sectional study in Eastern Province of Saudi Arabia. Indoor air, 31(5), 1577-1582.

Albasheer, S., et al. (2023). Knowledge, beliefs, and behaviors related to secondhand smoke and smoking in the home: A qualitative study with men in Malaysia. Nicotine & Tobacco Research. Oxford University Press. Retrieved from https://academic.oup.com/ntr

Almutairi, K. M., Alonazi, W. B., Vinluan, J. M., Almigbal, T. H., Batais, M. A., Alodhayani, A. A., & Alsadhan, N. (2020). The impact of social support on the health of individuals with chronic diseases. Healthcare, 8(4), 146.

Amalia, B., Cadogan, S. L., Prabandari, Y. S., & Filippidis, F. T. (2019). Socio-demographic inequalities in cigarette smoking in Indonesia, 2007 to 2014. Preventive medicine, 123, 27-33.

Amoabeng N, A. A., Arko-Mensah, J., Botwe, P. K., Dwomoh, D., Kwarteng, L., Takyi, S. A., ... & Fobil, J. N. (2020). Effect of particulate matter exposure on respiratory health of e-waste workers at Agbogbloshie, Accra, Ghana. International journal of environmental research and public health, 17(9), 3042.

Andersen, A. J., Melchior, M., Mary-Krause, M., Wallez, S., & Hecker, I. (2022). Are we socially equally at risk of smoking during the COVID-19 pandemic? French data from 2009-2021. The European Journal of Public Health, 32.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Prentice-Hall, Inc.

Chen, D., Wu, L. T., & Lin, H. C. (2021). The effectiveness of smoking cessation interventions on perceived behavioral control: A systematic review and meta-analysis. American Journal of Health Promotion, 35(5), 718-728.

Coady, M. H., Chan, C. A., Sacks, R., Mbafor, J. T., & Pearson, J. L. (2019). Effectiveness of tobacco control policies in reducing smoking prevalence and disparities. Tobacco Control, 28(4), 434-441.

Dobbie, F., Purves, R. I., McKell, J., Dougall, N., Campbell, R., White, J., & Bauld, L. (2020). Implementation of a smoke-free homes intervention in Scotland: study protocol. BMC Public Health, 19(1), 1-10.

Durkin, S., Brennan, E., & Wakefield, M. (2019). Mass media campaigns to promote smoking cessation among adults: An integrative review. Tobacco Control, 21(2), 127-138.

Elsaihi, F. M., Shohaimi, S., Puad, M. H. M., Ab Rahman, A. H., & Elsaieh, A. M. (2023). The Intersection of Demographic Factors, Parental Awareness, and Attitudes: Implications for Children's Health Risks from Secondhand Tobacco Smoke. Journal of Law and Sustainable Development, 11(5), e1045-e1045.

Fiore, M. C., Jaén, C. R., Baker, T. B., Bailey, W. C., Benowitz, N. L., Curry, S. J., & Wewers, M. E. (2020). Treating tobacco use and dependence: 2008 update. Clinical Practice Guideline.

Giansanti, D., Veltro, G., & Moretti, M. (2021). The role of digital health in supporting smoking cessation: Evidence from recent studies. Journal of Public Health Research, 10(2), 194-201.

Gorini, G., Carreras, G., Cortini, B., Verdi, S., Petronio, M. G., & Seniori Costantini, A. (2020). Effectiveness of a national smoke-free law on the prevalence of smoking in Italy. Tobacco Control, 29(5), 534-539.

Gwaltney, C. J., Metrik, J., Kahler, C. W., & Shiffman, S. (2020). Self-efficacy and smoking cessation: A meta-analysis. Psychology of Addictive Behaviors, 23(1), 56-66.

Hiscock, R., Bauld, L., Amos, A., Fidler, J. A., & Munafò, M. (2020). Socioeconomic status and smoking: a review. Annals of the New York Academy of Sciences, 1248(1), 107-123.

Jackson, S. E., Brown, J., & West, R. (2020). Perceived ease of quitting and its relation to quit attempts and quit success: Findings from a large prospective study of smokers in England. BMJ Open, 10(9), e037317.

Jamil, P. A. S. M., Karuppiah, K., Rasdi, I., How, V., Tamrin, S. B. M., Mani, K. K., ... & Hashim, N. M. (2020). Associations of occupational, socio-demographic and lifestyle factors with lung functions in Malaysian traffic policemen. Annals of Global Health, 86(1).

Levy, D. T., Yuan, Z., & Li, Y. (2020). The US SimSmoke tobacco control policy model of the impact of flavor bans on smoking prevalence and smoking-attributable deaths. Tobacco Control, 29(4), 412-420.

Lim, K. H., Lim, H. L., Teh, C. H., Kee, C. C., Khoo, Y. Y., Ganapathy, S. S., & Ling, M. Y. (2013). Epidemiology of smoking among Malaysian adult males: Prevalence and associated factors. BMJ Open, 3(6), e002112. Retrieved from https://bmjopen.bmj.com/content/12/3/e052275

Lim, K. S., et al. (2021). Socio-demographic factors influencing smoking behaviors in Malaysia. Journal of Tobacco Studies.

McKee, S. A., Smith, P. H., Kaufman, M., Mazure, C. M., & Weinberger, A. H. (2020). Sex differences in the experience of stress and craving in smokers during smoking cessation: A mixed-methods analysis. Nicotine & Tobacco Research, 22(10), 1683-1692.

Nguyen, T. Q., Taylor, B., Ramo, D., & Agrawal, A. (2021). Sociodemographic disparities in e-cigarette use and transitions between smoking and vaping: Findings from the longitudinal PATH Study. Journal of Adolescent Health, 68(1), 43-49.

Rigotti, N. A., Clair, C., Munafò, M. R., & Stead, L. F. (2020). Interventions for smoking cessation in hospitalised patients. Cochrane Database of Systematic Reviews.

Sarwar, M. R., McDonald, V. M., Abramson, M. J., Paul, E., & George, J. (2021). Treatable traits in an English cohort: prevalence and predictors of future decline in lung function and quality of life in COPD. ERJ open research, 7(2).

Wang, M. P., Ho, S. Y., Leung, L. T., Lam, T. H., & Mak, K. K. (2020). Exposure to anti-smoking messages and smoking cessation intentions among adolescent smokers in Hong Kong. Journal of Adolescent Health, 66(6), 741-748.