PARENTAL SMOKING HABITS AND CHILDREN'S EXPOSURE TO HOUSEHOLD SECONDHAND SMOKE IN KLANG VALLEY, MALAYSIA

By

WALI FATMA MASOUD ELSAIHI

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

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Chairman : Shamarina binti Shohaimi, PhD
Faculty : Science

Secondhand tobacco smoke presents a significant threat to children's health, particularly when caregivers smoke within the family home. Indoor smoking, especially by parents, has detrimental effects on children's health. Addressing the escalating issue of indoor smoking among adults in Malaysia is vital, as it serves as a critical risk factor. There is a notable lack of research on how parental smoking affects children's health, particularly regarding their addiction to nicotine and their parents' attitudes. Furthermore, prior studies seldom focus on the influence of parental demographics in elucidating the effects of indoor smoking practices on children's exposure to secondhand smoke. This study investigates the association between parental smoking practices and children's exposure to secondhand smoke. It encompasses various determinants of parents' indoor smoking behaviors, including their nicotine dependency, knowledge, attitudes, and smoking practices. Additionally, it explores how demographic factors may moderate the relationship between parental indoor smoking and the health risks children face from cigarette smoke exposure. Thus, this study proposes a health risk framework based on children's reported health

characteristics and levels of exposure. A cross-sectional study design was employed to collect data from 378 parents from four higher education institutions in the Klang Valley. The partial least squares technique and multiple linear regression were used to test the research hypotheses. The results underscore the significant impact of parents' knowledge (β=0.154, t=2.314, p=0.021) and attitudes (β=0.276, t=5.526, p=0.001) on children's exposure to secondhand smoke. The confluence of theoretical frameworks and empirical evidence can explain this influence. The Health Belief Model suggests that parents with greater knowledge of the dangers of smoking are more likely to perceive the health risks to their children as severe and actionable, leading to preventive measures. Moreover, these parents tend to adhere more closely to public smoking bans and household smoking rules, reducing the likelihood of secondhand smoke exposure. Regarding demographic factors, income significantly affects children's exposure to secondhand smoke (β=-0.144, t=2.711, p=0.007). The negative β-coefficient indicates that as parents' income increases, the children's exposure to secondhand smoke decrease. This can be attributed to higher-income families having greater resources to mitigate exposure, such as residing in larger homes with separate smoking areas or having better access to educational materials. The multiple regression analysis showed that nicotine dependence had a positive and significant effect on children's exposure to secondhand smoke (β=0.007, p=0.006). Conversely, parents' knowledge negatively and significantly affected these risks (β=-0.475, p=0.001), while parents' attitudes had a positive and significant impact (β=0.186, p=0.001). Participants' smoking habits displayed a negative association with children's exposure to secondhand smoke. However, this relationship was not statistically significant at the conventional 0.05 level (β=-0.04, p=0.079).

Expert evaluation of the proposed framework considered criteria such as clarity, reliability, applicability, completeness, and sustainability. Eighty-four percent of the experts agreed on the framework's clarity, suggesting that it was well understood and its objectives and components were clearly articulated. This study recommends the implementation of educational programs emphasizing the adverse effects on both parents' and children's health. Such programs can potentially be more effective in modifying parental behaviour, taking into account factors such as nicotine dependence, knowledge, and attitudes.

Keywords: nicotine dependence, parents' knowledge, parents smoking habits, children, secondhand smoke

SDG: GOAL 3: Good Health and Well-Being

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

TABIAT MEROKOK IBU BAPA DAN PENDEDAHAN ANAK-ANAK KEPADA ASAP ROKOK SEKUNDER DI RUMAH DI LEMBAH KLANG, MALAYSIA

Oleh

WALI FATMA MASOUD ELSAIHI

Januari 2024

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Asap rokok tembakau sekunder yang berpunca daripada penjaga yang merokok dalam rumah memberi ancaman besar kepada kesihatan kanak-kanak. Merokok di dalam ruangan tertutup, terutamanya oleh ibu bapa, mempunyai kesan buruk terhadap kesihatan kanak-kanak. Menangani isu yang semakin meningkat tentang merokok dalam rumah di kalangan orang dewasa di Malaysia adalah penting, kerana ia merupakan faktor risiko kritikal. Terdapat kurang kajian tentang bagaimana tabiat merokok ibu bapa menjejaskan kesihatan kanak-kanak, terutamanya berkaitan dengan ketagihan nikotin dan sikap ibu bapa. Selain itu, kajian terdahulu jarang memberi tumpuan kepada pengaruh demografi ibu bapa dalam menjelaskan kesan amalan merokok dalam rumah terhadap risiko kesihatan kanak-kanak.

Kajian ini menyiasat kesan pendedahan kanak-kanak kepada merokok dalam rumah oleh ibu bapa terhadap risiko kesihatan mereka. Ia merangkumi pelbagai penentu tingkah laku merokok dalam rumah ibu bapa, termasuk kebergantungan terhadap

nikotin, pengetahuan, sikap, dan amalan merokok mereka. Selain itu, ia juga menyelidik bagaimana faktor demografi boleh mempengaruhi hubungan antara merokok dalam rumah oleh ibu bapa dan risiko kesihatan yang dihadapi oleh kanak-kanak akibat pendedahan kepada asap rokok. Oleh itu, kajian ini mencadangkan rangka kerja risiko kesihatan berdasarkan kesihatan kanak-kanak dan tahap pendedahan mereka.

Reka bentuk kajian keratan rentas telah digunakan untuk mengumpul data daripada 378 ibu bapa dari empat institusi pengajian tinggi di Lembah Klang. Teknik 'partial least squares' dan regresi linear berganda telah digunakan untuk menguji hipotesis kajian ini. Hasil kajian menunjukkan impak yang signifikan pengetahuan ibu bapa (β=0.154, t=2.314, p=0.021) dan sikap ibu bapa (β=0.276, t=5.526, p=0.001) terhadap risiko kesihatan kanak-kanak akibat terdedah kepada asap rokok.

Penggabungan rangka kerja teori dan bukti empirikal dapat menjelaskan pengaruh ini. Model Kepercayaan Kesihatan mencadangkan bahawa ibu bapa yang mempunyai pengetahuan yang lebih tinggi tentang bahaya merokok lebih cenderung untuk menyedari risiko kesihatan yang serius kepada anak-anak mereka dan mengambil langkah-langkah pencegahan yang perlu. Selain itu, ibu bapa ini cenderung untuk lebih mematuhi larangan merokok di tempat awam dan peraturan merokok di rumah, seterusnya mengurangkan kemungkinan pendedahan kepada asap rokok sekunder.

Dari segi faktor demografi, pendapatan didapati memberi kesan yang signifikan terhadap risiko kesihatan kanak-kanak akibat pendedahan kepada asap rokok (β=-0.144, t=2.711, p=0.007). Pekali β negatif menunjukkan bahawa semakin tinggi

pendapatan ibu bapa, semakin rendah risiko kesihatan anak mereka akibat pendedahan kepada asap rokok sekunder. Ini boleh dikaitkan dengan keluarga yang berpendapatan tinggi mempunyai sumber yang lebih besar untuk mengurangkan pendedahan terhadap asap rokok sekunder, seperti menetap di rumah yang lebih besar dengan kawasan merokok yang berasingan atau mempunyai akses yang lebih baik kepada bahan pendidikan.

Analisis regresi berganda menunjukkan kebergantungan terhadap nikotin mempunyai kesan yang positif dan signifikan terhadap risiko kesihatan kanak-kanak akibat pendedahan kepada asap rokok (β=0.007, p=0.006). Sebaliknya, pengetahuan ibu bapa memberi kesan yang negatif dan signifikan terhadap risiko ini (β=-0.475, p=0.001), manakala sikap ibu bapa memberi kesan yang positif dan signifikan (β=0.186, p=0.001). Amalan merokok peserta menunjukkan hubungan negatif dengan risiko kesihatan kanak-kanak akibat pendedahan kepada asap rokok. Namun, hubungan ini tidak signifikan secara statistik pada aras signifikan 0.05 (β=-0.04, p=0.079).

Penilaian pakar terhadap cadangan rangka kerja ini mempertimbangkan kriteria seperti kejelasan, kebolehpercayaan, kebolehgunaan, kesempurnaan, dan kemampanan. Lapan puluh empat peratus pakar bersetuju dengan kejelasan rangka kerja, menunjukkan bahawa rangka kerja tersebut dapat difahami dengan baik serta objektif dan komponennya dinyatakan dengan jelas. Kajian ini mencadangkan pelaksanaan program pendidikan yang menekankan kesan buruk terhadap kesihatan ibu bapa dan kanak-kanak. Program sedemikian berpotensi lebih berkesan dalam mengubah tingkah laku ibu bapa dengan mengambil kira faktor seperti kebergantungan terhadap nikotin, pengetahuan, dan sikap.

Kata Kunci: kebergantungan nikotin, pengetahuan ibu bapa, sikap ibu bapa, tabiat merokok ibu bapa, risiko kesihatan kanak-kanak, Lembah Klang

SDG: MATLAMAT 3: Kesihatan dan Kesejahteraan Baik

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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Smoking tobacco remains a significant public health concern globally, as both active and passive smoking cause various adverse health effects. While the detrimental effects of active smoking on human health are extensively researched and well-established, the risks associated with secondhand smoke exposure, particularly concerning children, are not as clearly defined. Children are more susceptible than adults to adverse health consequences from secondhand smoke due to their developmental stage. Klang Valley, the most populous area in Malaysia, faces challenges in addressing children's exposure to household secondhand smoke.

In Malaysia, the prevalence of adult smoking is notably high and is significantly influenced by cultural factors and societal norms that shape familial smoking patterns (WHO, 2019). The World Health Organization estimated that, as of 2019, approximately 23% of the Malaysian population are smokers. It is worth noting that smoking rates differ significantly by gender. For example, men who retired from the Armed Forces are more likely to smoke than women, and over 40% of Malay men are smokers compared to less than 2% of women. The Klang Valley, encompassing Kuala Lumpur and its neighboring towns and cities, represents the most populated part of Malaysia and thus provides a critical context for studying smoking behaviors and their impacts on public health.

The primary objective of this research is to elucidate the relationship between parental smoking habits, including the use of traditional cigarettes and electronic vaping devices, and the children's exposure associated with secondhand smoke (SHS) and secondhand aerosol exposure among children in various locales of Klang Valley, Malaysia. This study aims to comprehensively assess the children's exposure posed to children in indoor environments by quantifying the levels of SHS and secondhand aerosols generated by parental smoking practices. It will further evaluate the resultant health outcomes in children, thereby providing a clearer understanding of the direct impacts of such exposures on pediatric health (Öberg et al., 2019).

Klang Valley is a suitable study area for this research because it is highly urbanized and has a heterogeneous population with a highly diverse socioeconomic stratification. Because of this, varying factors influence household smoking patterns and exposure levels. Moreover, perceptiveness norms and societal aspects united to smoke habits could potentially for parental behavior, consequently shaping the pervasiveness of secondhand smoke undefined within the confines of homes. As such, conducting a thorough investigation of these undefined within the Klang valley area could succumb invaluable insights into the health threats children encounter. These insights are beneficial in formulating targeted interventions and policies to deal with these issues effectively (Sorensen et al., 2018).

In this study, 'children's health risk' refers to the potential adverse health outcomes that non-smoking children may experience as a result of exposure to secondhand smoke (SHS) and secondhand aerosols from vaping devices and shisha. The study measures this risk based on the frequency and duration of the children's exposure to

SHS. This encompasses a wide range of possible health effects, including respiratory infections, aggravation of asthma, and other developmental health concerns directly linked to inhalation or contact with these pollutants.

We aim to establish consistency in the terminology to highlight the direct correlation between exposure levels and the probability of adverse health outcomes in children, thereby emphasizing the importance of interventions aimed at reducing exposure (U.S. Department of Health and Human Services, 2014; World Health Organization, 2019). This distinction is critical for understanding the scope and objectives of this research and for developing public health strategies aimed at protecting children's health.

1.2 Research Background

Secondhand smoke (SHS), also known as passive smoking or involuntary tobacco smoke exposure, involves the inadvertent inhalation of another person's cigarette smoke (Lim et al., 2020). According to Orton et al. (2020) and Lim et al. (2018), indoor smoking combines the dangers of both mainstream smoke, which is directly inhaled by the smoker, and side stream smoke, which emanates from the burning end of a cigarette. Intriguingly, even though passive smokers are exposed to a quantity of cigarette smoke that is approximately 100 times lower than that of active smokers, their relative risk of cardiovascular disease remains comparably high (Panagiotakos et al., 2018). SHS exposure increases the relative incidence of lung cancer by 20% to 30%, heart disease by 25% to 30%, stroke by up to 82%, and other non-fatal respiratory illnesses by 20% to 30%, significantly impacting a person's health (Lim et al., 2018).

According to the American Lung Association (2019), SHS is associated with persistent metabolic symptoms in adults, recurring wheezing, respiratory infections, weak lungs, asthma, and impaired lung function. Globally, SHS exposure causes 600,000 deaths annually, with children making up 28% of these deaths (WHO, 2008; Tanski and Wilson, 2012; Wang et al., 2022; Lim et al., 2018). Secondhand smoke from caregivers who smoke in family homes has harmful health effects on children (Ratschen et al., 2018), including higher risks of respiratory tract infections, middle ear infections, sudden unexpected death in infancy, and asthma (Orton et al., 2020).

Cheraghi and Salvi (2009) reported that youngsters exposed to SHS, or environmental tobacco smoke, have significantly higher morbidity and mortality rates. They also face higher risks of metabolic illnesses, asthma and bronchial asthma exacerbation, cough, middle ear infections, hospitalizations, childhood cancer, cardiovascular disease, and sudden infant death syndrome (Best, 2009; Oberg et al., 2011). Oberg et al. (2011) reported that in 2004, 40% of children, 33% of non-smoking men, and 35% of non-smoking women were exposed to SHS globally, leading to 603,000 deaths, 28% of which were children. China, the world's leading tobacco producer and consumer, has 350 million smokers (Yang and Chen, 2011) and 740 million passive smokers, including 180 million children under 15 years old (Zheng et al., 2014). The magnitude of health complications caused by SHS underscores the urgent need for coordinated interventions, especially in densely populated countries.

Effective strategies for minimizing SHS exposure must include establishing smoke-free zones in workplaces, residences, and public spaces (Shelley et al., 2005). Significant efforts to implement smoke-free regulations have successfully eliminated

SHS exposure in open spaces and workplaces (Shelley et al., 2005; Merom and Rissel, 2001). However, Abdullah et al. (2012) contend that children are most likely to be exposed to SHS at home, where exposure is often more severe, prolonged, and in close proximity than in public areas (China CDC, 2010). The 2010 China Global Adult Tobacco Survey (GATS) found that SHS exposure at home (67%) was higher than at the workplace (63%), public buildings (58%), and schools (37%) (Pizacani et al., 2004). Strict implementation of a home smoking ban helps prevents parental smoking and minimizes or prevents children's exposure to SHS (Farkas et al., 1999; Feng et al., 2010). Additionally, tobacco cessation is pivotal in reducing the harm and burden of illnesses caused by smoking (Wu et al., 2019).

1.2.1 Parents' Nicotine Dependence

Parental nicotine dependence is a critical determinant of children's well-being. According to Kuppens et al. (2020), the prolonged effects of parental tobacco use on children's well-being are both detrimental and far-reaching. Their study highlights the transgenerational consequences of nicotine addiction, particularly on the psychological and emotional development of the next generation. This dependence fosters a more permissive environment for tobacco consumption, normalizing smoking habits and increasing the likelihood of smoking initiation among children. Similarly, Lassi et al. (2019) found that the locus of control is significantly associated with tobacco and alcohol consumption, suggesting that parents with poor control over their nicotine dependence could potentially encourage similar behavioral tendencies in their children.

1.2.2 Parents' Knowledge

Understanding parents' awareness of children's exposure to smoking, including traditional tobacco use, secondhand smoke, and aerosols, is crucial in mitigating these risks for children. AlOtaibi and AlAteeq (2018) explored parental knowledge regarding childhood asthma and discovered that parents who were better informed about the health implications of smoking were more proactive in adopting behaviors to reduce exposure risks. Specifically, parents with a comprehensive understanding of both the immediate and long-term risks associated with smoking and secondhand exposure were found to implement stricter rules on tobacco and electronic vaping device use within the home. This observation is reinforced by de Buhr and Tannen (2020), who found a significant link between parental health literacy and the adoption of healthier behaviors, leading to improved health outcomes for children.

1.2.3 Parents' Attitudes

Parents' attitudes toward smoking are a determining factor in their children's views and behaviors regarding cigarette smoking. Petrauskienė et al. (2020) examined parents' oral health behaviors and attitudes toward dental care and found a correlation with their children's dental health. Similarly, parental attitudes toward smoking play a critical role in shaping their children's perspectives and behaviors related to smoking. Unmindful parental attitudes can promote smoking initiation and diminish the effectiveness of prevention programs (Duncan et al., 2018).

1.2.4 Parents' Smoking Habits

Parents' smoking habits, whether involving traditional cigarettes or e-cigarettes, create a physical and social environment that can either encourage or prevent smoking initiation in children. Drehmer et al. (2019) highlighted that parental smoking and e-cigarette use at home and in cars significantly increase the risk of children's secondhand smoke exposure. Furthermore, Nabi-Burza et al. (2019) demonstrated that treating parents for tobacco use in a pediatric setting significantly reduces the risk of secondhand smoke exposure among children, thereby reinforcing the importance of active intervention in parental smoking practices.

1.3 Problem Statement

In 1999, the World Health Organization (WHO) published a consultation report declaring that secondhand smoke (SHS) presents a significant risk to children's well-being. Based on research conducted in 2006, the U.S. Surgeon General concluded that no level of SHS exposure is safe. Researchers have found a troubling association between children's exposure to SHS and an increase in childhood illnesses and death rates in the United Kingdom, where more than half of the children with smoking parents at home are constantly exposed to SHS (Orton et al., 2020). A report on smoking in the United States revealed that while 19.3% of American adults are smokers, an alarmingly high proportion of children (59%) have biochemical markers indicative of SHS exposure (Tanski and Wilson, 2012). The 2017 WHO statistics painted a grim picture, with tobacco claiming seven million lives annually. The findings of a 2021 study were even more distressing; of the more than eight million lives lost due to tobacco use, 1.2 million were non-smokers exposed to the harmful

effects of SHS (WHO, 2021). These alarming statistics underscore the urgent need for a concerted global response to mitigate the harmful effects of SHS, particularly among children.

Various factors contribute to SHS exposure at home, and the most effective way to minimize infant SHS exposure is for smoking parents to quit (Orton et al., 2020). Lim et al. (2018) used the 2011 findings of the Global Adult Tobacco Survey to investigate SHS exposure at home and in the workplace among Malaysian non-smokers aged 15 or older. Additionally, Abidin et al. (2014) examined SHS exposure and cognitive ability among Malaysian adolescents aged 13-14. In Malaysia, SHS exposure is significantly higher in non-restricted areas compared to restricted areas (81.9% vs. 22.9%), leading to increased morbidity and mortality (Lim et al., 2018).

There is limited information on children's exposure to secondhand smoke (SHS) among those under the age of 12, who may be particularly sensitive to its effects, despite several past studies on SHS exposure. Abidin et al. (2011) investigated the factors influencing children's exposure to secondhand smoke, but the mean age of the children in this study was over 12 years old, and the data was gathered through face-to-face interviews with the children. Most studies have focused on gathering data directly from children or adolescents within the investigated age group. Researchers from other parts of the world have used data collected from parents or guardians to assess the risk perception and health effects of SHS (Shiva and Padyab, 2008; Ribeiro et al., 2015; Rosen and Kostjukovsky, 2015; Saldanha et al., 2017; Myers et al., 2020). This study aims to determine the exposure of non-smoking children under 12 years old in Klang Valley, Malaysia, to indoor secondhand smoke and secondhand vaping,

using feedback from their smoking parents gathered through a quantitative assessment.

This research explored the relationship between parents' smoking behaviors and children's exposure to household secondhand smoke in the densely populated Klang Valley, Malaysia. Despite growing awareness of the risks associated with secondhand smoke, the continuously increasing number of smoking adults in Malaysia raises grave concerns about children's exposure to secondhand smoke from smoking parents. Understanding the dynamics of parental smoking behaviors and their specific impacts on children's health in the Klang Valley is crucial for formulating targeted interventions and policies aimed at protecting children from the harmful effects of passive smoking (Sarkar et al., 2021).

Klang Valley, as the most densely populated region in Malaysia, presents an optimal setting for examining this issue. Urbanization, diverse populations, and varied socioeconomic contexts influence smoking patterns and secondhand smoke exposure at home (Ghazali et al., 2019). Additionally, cultural norms and societal attitudes towards smoking affect parents' smoking behaviors and the prevalence of indoor secondhand smoke exposure. A detailed examination of these factors in the specific context of Klang Valley will provide invaluable insights into children's exposure to secondhand smoke and offer a robust foundation for designing evidence-based strategies to effectively mitigate this exposure (Lim et al., 2020).

To understand these complex exposure dynamics and their associated health impacts, this study uses the Delphi method to create a comprehensive framework (Hsu &

Sandford, 2007). This method, which involves a structured interaction among experts, will help refining assessment of parental smoking habits and measure the extent of SHS exposure, among other outcomes. The expert consensus approach ensures that the findings are based on a broad agreement among experts, thereby enhancing the reliability and effectiveness of the evidence-based recommendations for reducing children's exposure to tobacco smoke in the Klang Valley region. Through this procedure, we aim to fill a critical knowledge gap and provide evidence-based recommendations that will contribute to safeguarding children's health as part of the global effort to reduce the harmful effects of SHS.

Also this research assesses parental smoking habits, quantifies children's exposure to secondhand smoke, and examines the associated health outcomes in Klang Valley. The research findings will contribute to the knowledge of the harmful effects of secondhand smoke on children's health and shape the targeted interventions and policies to ensure the well-being of children in the area.

1.4 Research Questions

This research aims to answer the following questions.

RQ (1): How do parental nicotine dependence, knowledge, attitudes, and smoking habits affect the health risks of children exposed to secondhand smoke?

RQ (2): How do parents' and guardians' knowledge, attitudes, and habits regarding secondhand smoke and its effects on children's health vary with demographic factors?

RQ (3): Which parents'/guardian's smoking habits affect children's exposure the most due to secondhand smoke exposure?

1.5 Research Objectives

This study aims to quantify the exposure levels of non-smoking children to indoor secondhand smoke (SHS) and secondhand aerosols from vaping, and to determine the associated children's health risks in the Klang Valley, Malaysia. The objectives are as follows:

RO (1): To quantify and assess the impact of parents' nicotine dependence, knowledge, attitudes, and smoking habits including the use of traditional cigarettes, electronic cigarettes, and shisha on the level of SHS and secondhand aerosol exposure among non-smoking children. This objective will also consider the correlation of these factors with children's exposure scores to identify specific risk patterns.

RO (2): To evaluate the influence of demographic factors on parents' and guardians' knowledge, attitudes, and practices regarding SHS and secondhand aerosol exposure, and its implications for children's health risk. This will involve analyzing how these perceptions and habits vary across different demographic groups within the Klang Valley.

RO (3): To determine which specific habits related to smoking and vaping by parents/guardians are most detrimental to children's health risk, based on the exposure levels and the derived children's exposure scores. This includes identifying practices that contribute to the highest exposure scores and, consequently, the greatest health risks to children.

RO (4): To develop a comprehensive framework for assessing children's exposure to SHS and secondhand aerosols, factoring in reported health characteristics of the children, their exposure levels, and the established scoring criteria. The framework will include a scoring system to quantify exposure, with defined cutoff points indicating significant health risks, thus facilitating targeted interventions.

1.6 Research Significance

This research addresses the knowledge gap concerning children's exposure to secondhand smoke by providing a detailed understanding of the specific dynamics and health outcomes related to parental smoking habits in Klang Valley. Despite growing awareness of the risks associated with secondhand smoke, there is limited understanding of these specific dynamics. This study provides evidence-based insights into the prevalence of parental smoking, the extent of children's exposure to secondhand smoke, and the associated health risks.

By identifying the specific risks faced by children in Klang Valley homes with smoking parents, this research will inform targeted interventions. These interventions will address the cultural, socioeconomic, and environmental factors influencing parental smoking habits and secondhand smoke exposure. The data gathered will enable decision-makers in public health, healthcare sectors, and policy-making to develop and implement programs that protect children's health.

Additionally, research on parental smoking habits and children's exposure to secondhand smoke in Klang Valley can increase public awareness (Xie et al., 2020). The outcomes can benefit various platforms such as community outreach projects,

educational programs, and public health campaigns, supporting advocacy initiatives, encouraging behavioral changes, and advocating for a smoke-free environment for children by enhancing understanding of the health dangers of secondhand smoke.

The research findings provide evidence for developing sound policies and regulations to reduce children's exposure to secondhand smoke in Klang Valley, Malaysia. Policymakers can use these findings to advocate for smoke-free homes, implement stricter tobacco control measures, and allocate resources for public health initiatives targeting parental smoking habits. This research contributes to creating an environment that prioritizes children's well-being by translating findings into effective policies.

While this research focuses on Klang Valley, Malaysia, the findings have broad implications for other regions and countries facing similar challenges. The knowledge generated can serve as a basis for further comparative studies and as a reference for policymakers and researchers globally. This research provides a deeper understanding of the health risks associated with parental smoking habits and children's exposure to secondhand smoke, thereby contributing to global tobacco control efforts and the protection of child health.

The Delphi method was used to achieve expert consensus on how best to assess, quantify, and reduce SHS exposures. This iterative process ensure that the recommendations and findings are grounded in solid expert agreement, thereby enhancing the research impact and ensuring that valuable information for developing interventions and policies is obtained (Hsu & Sandford, 2007. The Delphi method not

only enriches the research methodology but also reinforces the evidence base for targeted public health strategies.

By bridging these gaps, this study will provide critical insights into the nuanced dynamics of tobacco smoke exposure within homes and empower policymakers, public health professionals, and caregivers with the knowledge to protect children from the risks of SHS. Consequently, this research enhances the understanding of the multiple types of tobacco exposure risks to children in Klang Valley and other similar regions.

The importance of searching parental smoking behaviors and health hazards from children's exposure to secondhand smoke in homes in Klang Valley, Malaysia, encompasses several critical aspects, including bridging the knowledge gap, shaping well-formulated interventions, increasing awareness and advocacy, contributing to policy development, and broadening the global implications of the present research (Wang et al., 2022). In dealing with this fundamental issue, the researcher hopes to provide protection of children's health and well-being, cultivate healthier environments, and alleviate the burden of tobacco-induced harm in the population. The research outcomes can enrich the current knowledge on the adverse effects of secondhand smoke on children's health, thus helping policymakers and public health authorities discern the specific health threats related to parental smoking habits in Klang Valley and conceive and implement strategies rooted in empirical evidence to deal with the risks effectively. The overarching objective is to defend children's well-being and foster a healthier environment for future generations in Klang Valley, Malaysia.

1.7 Scope of the Study

This research employed the Theory of Planned Behavior (Ajzen, 1991) as a theoretical framework to investigate the effects of parental smoking habits on children's health risks. This theory posits that a person's attitude, subjective norms, and perceived behavioral control influence their intentions and behavior (Ajzen, 1991)1. This research will be investigating parents' attitudes, knowledge, and habits towards smoking and children's health risks from secondhand smoke exposure.

This study is conducted in a specific context, and the participating parents are the staff members with children at four selected Malaysian universities: Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM), Universiti Malaya (UM) and Sunway University. These institutions were selected because their large staff size of about 19,524 facilitates the data collection and ensures a high response rate. The researcher was granted access to these universities for data collection following an official approval process.

The research administered a structured questionnaire to gather data directly from the target population. The SPSS software (version 25) was employed to perform the descriptive analysis, and SmartPLS software (version 3) used the Partial Least Square (PLS) method for model measurements and hypothesis testing to fulfill the first and second research objectives. Multiple linear regression analysis was conducted to test the third research objective.

1.8 Structure of the Research

This thesis comprises five chapters to facilitate the research flow and understanding.

Chapter 1 is the Introduction and presents a general research overview, outlines its context, the research statement, research aims, and research questions, and its significance, scope, operational definitions, and organizational structure.

Chapter 2 is the Literature Review, which presents a detailed literature review analysis. It reviews previous research and presents conclusions on parental smoking habits and the hazards of second-hand smoke on children's health. The chapter also presents a theoretical framework based on the Theory of Planned Behavior.

Chapter 3 discusses the Research Methodology, including the research design, data collection process, sample protocols, and research instruments. It also describes the techniques employed for data analysis.

Chapter 4 presents the Research Findings. This chapter assesses and presents the data methodically and comprehensively based on the research objectives and questions.

Chapter 5 Discusses and analyzes the research findings and provides recommendations for future studies. The chapter examines the research findings relative to previous research and the prevailing theoretical framework. This chapter also summarizes the key results and their consequences and provides recommendations for future research, policy development, and treatments to mitigate

the adverse health impacts of parental smoking on children. Finally, the chapter discusses the limitations of this research.

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