

THE KNOWLEDGE OF SECONDHAND SMOKE AMONG PARENTS OF ASTHMATIC CHILDREN AND THEIR EFFICACY BELIEFS IN PROTECTING THEIR CHILD FROM SECONDHAND SMOKE EXPOSURE

Norafisyah Makhdzir¹, Mohamad Hafiqzuddin Sha'ari¹, Lee Siew Pien², Siti Aishah Hamzah¹

¹ Department of Nursing, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

² Kulliyah of Nursing, International Islamic University Malaysia, Malaysia

Corresponding author: Norafisyah Makhdzir; norafisyah@upm.edu.my; Department of Nursing, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400, Serdang, Selangor, Malaysia.

ABSTRACT

Objective: This study aimed to evaluate parents' knowledge of secondhand smoke (SHS) and their efficacy beliefs in protecting their child from SHS exposure and the relationship between knowledge of SHS and the efficacy beliefs in protecting their child from SHS.

Method: This study employed a cross-sectional research design at the paediatric clinic of an urban Malaysian public hospital. The population consisted of 120 parents of patients younger than 13 seeking regular follow-up care for bronchial asthma at the hospital's paediatric clinic. The data was collected via a self-administrated questionnaire.

Result: Overall, 88 parents (73.3%) reported had adequate knowledge about SHS, and 67 parents (56.7%) had efficacy beliefs in protecting their children from SHS exposure. There is a statistically significant weak positive correlation between parents' knowledge about SHS and efficacy beliefs in protecting their children from exposure to SHS ($r = 0.19$, $p = 0.03$). A significant association was observed between monthly household income and efficacy beliefs in protecting their children from exposure to SHS ($\chi^2 = 7.81$; $p = 0.02$). Parents' knowledge of secondhand SHS was associated with the information they acquired about SHS from healthcare professionals ($\beta = 0.54$, $p < 0.05$) and friends ($\beta = -0.25$, $p < 0.05$).

Conclusion: The findings highlight the critical role of education in empowering parents to take proactive measures to protect their children from secondhand smoke exposure. It has substantial implications for the health education programmes and interventions, emphasising the need to provide correct information to parents to boost their confidence and, eventually, improve child health, reduced healthcare costs, and better overall well-being for the community.

Keywords: *Secondhand smoke exposure, children, asthma, parents, knowledge, efficacy belief*

1. Introduction

Asthma affects anywhere from 10 to 20% of the paediatric population in Malaysia, as

compared to 5% to 10% in Korea and Indonesia and 5% to 20% of the paediatric population in Japan (Global et al., 2014). According to a study by López Blázquez, Pérez Moreno, Vigil Vázquez, & Rodríguez Fernández (2018), children exposed

to SHS are more likely to be admitted to the Emergency Department with low oxygen saturation and a high score on the asthma exacerbation severity scale. The International Agency for Research on Cancer (2012) defines SHS as the smoke that comes from the burning tip of a cigarette or other burned tobacco product between puffs. Exposure to SHS will activate transient receptor potential channels (TRPs) located on the membranes of epithelial and sensory cells that can cause the child to be more likely to develop airway inflammation or have an asthma exacerbation (Earley & Brayden, 2015). Nevertheless, some children react differently to SHS; some can tolerate SHS physiologically, while others who are intolerant of SHS might impose a high risk of developing airway inflammation or asthma exacerbation (Gopal, Mukherjee, & Das, 2016).

Multiple studies have provided evidence suggesting a positive correlation between cotinine levels, a metabolite of nicotine, and exposure to cigarette smoke among individuals residing in lower socio-economic communities, particularly children. These investigations have primarily relied on the analysis of blood samples to assess cotinine concentrations. This phenomenon can be attributed to the increased likelihood of individuals residing close to smokers, which may result from the high population density of their residential areas or insufficient ventilation systems (Zhang et al., 2018). Certain factors, such as restricted availability of educational resources, limited access to healthcare services, and a shortage of employment prospects (Cano et al., 2021), have been observed to contribute to elevated smoking rates within specific communities.

It has been suggested that individuals within these communities may turn to smoking to cope with stress or as a form of social engagement (Jahnel, Ferguson, Shiffman, & Schüz, 2019). Based on the reported prevalence of current smokers at 21.3% (95% CI: 19.86, 22.75) as documented in the National Health and Morbidity Survey (NHMS) 2019, it is plausible to anticipate a correspondingly higher prevalence of exposure to SHS within the home environment, estimated at 31.0% (95% CI: 29.15, 32.82) (Institute for Public Health & Malaysia, 2019).

The figure raises concerns as it indicates a potential prevalence of smoke exposure among children in their residential environments. Exposure to SHS extends beyond

the confines of the home environment, as children are also susceptible to SHS exposure in public eateries. The report also indicates that individuals who visit eateries without air conditioning had a significantly higher rate of exposure, estimated at 48.1% (95% CI: 45.83, 50.32), compared to those who visited eateries with air conditioning, where the exposure rate was estimated at 8.5% (95% CI: 7.17, 10.17) (Institute for Public Health & Malaysia, 2019). The heightened prevalence of SHS exposure, as observed in both residential settings and dining establishments, poses a significant risk to children's respiratory health. This phenomenon involves an increased vulnerability to the development of asthma or the worsening of pre-existing asthmatic symptoms in affected individuals (Antunes et al., 2016).

Even though the effects of SHS on children's risk of developing asthma are well documented, several studies have found that many parents are either unaware of or oblivious to the detrimental effects of SHS. For instance, a survey of parents' attitudes against SHS in Poland found that 23% of parents brought up the subject of tobacco use in conversation with their children's paediatricians (Ratajczak et al., 2018). This demonstrates how little most parents know about how smoking affects their children. According to a study by (Shiva & Padyab, 2008), 75% of parents were uninformed that SHS was hazardous to their children whereas 25% of parents knew that SHS was bad for children and that it might lead to serious disease or even death. Given that several studies have found that SHS exposure is a modifiable risk factor for paediatric asthma (Anstey & Chen, 2018; Jiang et al., 2019; Milanzi et al., 2017), parents of children with asthma may benefit greatly from a better understanding of how SHS may affect their children and how they can protect their children from SHS exposure.

The primary objective of this study was to evaluate the level of parental awareness regarding the potential hazards associated with SHS. Additionally, the study sought to examine parents' efficacy beliefs in their ability to protect their children with asthma from the harmful effects of SHS. The purpose was to better understand how parental awareness of SHS risk factors affects their actions and perspectives by evaluating their level of information and confidence in their ability to prevent their children from being exposed to these hazards. Findings from this study can contribute to the advancement

of targeted interventions and educational strategies designed to increase parental awareness of the dangers of SHS. Thus, parents will be empowered to take appropriate and effective measures to safeguard the health of their asthmatic children.

2. Materials and Method

This study employed a cross-sectional research design at paediatric clinic of a Public Hospital in an urban area in Malaysia. The population consisted of 120 parents of patients younger than 13 years, who sought regular follow-up care for bronchial asthma at the paediatric clinic of the respective hospital. The response rate observed in this study was 80%. This calculation was based on a predetermined sample size of 150 respondents, which was determined using the Raosoft Calculator.

According to earlier research by Hussein et al. in 2015, The response rate was 80% based on the predetermined sample size of 150 respondents, which was calculated using the Raosoft Calculator with a 95% confidence level, a 50% response distribution, a 5% margin of error and a population of 335 children with asthma in Malaysia (Hussein et al., 2015).

2.1 Respondents Recruitment

Parents were included if they (1) had at least one child with bronchial asthma and (2) spoke Malay and English. They completed the questionnaire while waiting for the doctor to see their child. After receiving their queue number.

2.2 Questionnaire

The questionnaire employed in this research was adapted from previous studies conducted by Ratajczak et al. (2018) on the examination of parental smoking attitudes and behaviours within pediatric primary care settings, as well as the survey conducted by Ooi, Teh, Tam, Sadasivan, and Kadirvelu (2014) which explored perceptions and practices regarding passive smoking among urban working adults. Both questionnaires were discovered within the public domain.

The questionnaire comprised three separate sections, with the initial section focused on obtaining socio-demographic information from the

respondents. The second section of the survey consists of dichotomous questions designed to elicit responses in the form of true or false. Most of the questions were regarding what the parents understood about SHS. A grading method was used with a total score of 70. A total of ten marks were allocated for each response that was deemed to be correct. Scores between 35 and 70 were classified as adequate, while scores below 35 were considered inadequate. Another variable assessed within the scope of this study pertains to the respondents' beliefs regarding protecting their children from exposure to SHS. The overall score for this component was 60. The answer that showed their confidence in protecting their children from SHS received a score of 10. A score between 30 and 60 shows positive efficacy belief, while scores below 30 show negative efficacy belief. Parents were asked questions regarding the SHS information they had previously received in the third and final section.

The questionnaire was originally written in the English language prior to its translation into Malay and subsequent scrutiny by a qualified translator. The questionnaire's reliability and validity were thoroughly assessed prior to its dissemination among the respondents. For instance, it was reviewed and verified by university academicians with experience in environmental health to confirm its validity. After that, it was sent to 24 parents at the pediatric ward of the same hospital for the reliability test, and Cronbach's alpha coefficient testing was carried out with a value of 0.78.

2.3 Data Collection Process

The questionnaire was distributed among the parents of children diagnosed with bronchial asthma who had sought treatment for their child at paediatric clinic as part of their routine check-up. The respondents were allowed to choose between the English or Malay version of the questionnaire, depending on their preferred language. The participant information sheet was attached to the forefront of the questionnaire, allowing the respondents to read through the entirety of the study's details before granting their consent. This document elucidated the study's objectives, the extent of their involvement, and the potential risks they might encounter.

The respondents were requested to put their signatures on the consent form to signify that they consented to the study. Subsequently, the researcher handed them a set of printed

questionnaires, which they were required to complete.

2.4 Ethical Considerations

The respondents' anonymity was maintained by providing a unique serial number assigned to each participant. The respondents' details, including their child's name and clinic registration number, were meticulously organized, and stored in separate folders based on their respective serial numbers. A password has been established for the folder to restrict access solely to authorized researchers. Each participant was allocated a designated time frame of 10-15 minutes to read the participant information sheet, a comprehensive document encompassing pertinent details about the study. Upon reaching a mutual agreement to partake in the study, the individuals were subsequently requested to affix their signature on a document known as the informed consent form. Respondents were notified that they can terminate their involvement in the study at any given moment. Ethical approval for this study was obtained from the National Medical Research Register. (NMRR) (Ref No: KKM.NIHSEC. P19-123).

2.5 Variables of interest

The efficacy beliefs protecting the child from SHS were considered dependent variables. The independent factors of interest were demographic and socioeconomic characteristics such as education level, age, family income, and knowledge of SHS, which will be determined by the total mean of 7. In addition, the potential influences of their knowledge and efficacy beliefs in protecting their child from SHS, such as prior information on SHS, were analysed.

2.6 Statistical Analysis

Statistical analysis for this study was conducted using SPSS Version 21. Using the Shapiro-Wilk normality test, the mean data of parents' knowledge and efficacy levels were employed, and the results demonstrated that the data was normally distributed ($p < 0.05$). Hence, the Chi-square test was used to identify the association between sociodemographic characteristics and level of knowledge regarding SHS among parents of asthmatic children as well as the association between sociodemographic characteristics and parents' efficacy beliefs in

preventing the child from SHS. Meanwhile, Pearson correlation coefficients (r) were used to examine the relationship between level of knowledge of SHS and the efficacy beliefs in preventing the child from SHS.

3. Results

3.1 Sociodemographic of respondents

One hundred twenty eligible parents agreed to participate in this research. Due to time constraints and difficulty controlling their child during answering the questionnaires, 30 parents withdrew their agreement and were omitted from the statistical analysis. The mean age of patients was 31 years, ranging from 19 to 38 years old. A total of 85 parents have at least one child with a history of bronchial asthma for more than a year, while another 35 parents have at least one child with a history of bronchial asthma for less than a year.

Most parents (79.2%) had finished university-level education, whereas 20.8% had only completed high school. 46.7% of the parents had monthly household income more than RM3000 per month. 40.8% of the parents had a monthly household income between RM2000 and RM3000. The remaining 12.5% of parents had a monthly household income of less than RM2000 (Table 1).

Table 1. Descriptive results of the respondents' characteristics

Respondents' characteristics	Mean (SD)	Range	n (%)
Age (years old)	31 (8.5)	19-38	
Educational Level			
Secondary School			25 (20.8)
Tertiary Education			95 (79.2)
Monthly Household Income (RM)			
< 2000			15 (12.5)
2000 - 3000			49 (40.8)
> 3000			56 (46.7)

Sixty-three parents, or 52.5%, cited the media as their primary source of information on SHS. Internet, television, and radio were the three common media outlets cited by the parents. A total of 41 parents (34.2%) said they learned about the hazards of SHS from a physician or nurse in the paediatrics department. In addition, 24 parents (20%) reported learning about SHS from

acquaintances. Additionally, 20 parents (16.8 %) cited their relatives as a source of knowledge.

3.2 Knowledge of SHS and efficacy beliefs in protecting their child from SHS

Overall, 88 parents (73.3%) had adequate SHS knowledge. The majority of parents correctly answered six of seven knowledge questions (mean 4.21, SD = 1.16). Parents appeared knowledgeable about the harmful consequences of SHS exposure, which were asked in four questions. They also agreed that children are more vulnerable to SHS than adults (96.7% answered correctly, 3.3% incorrectly). The high prevalence of misunderstanding was discovered in a knowledge item, with parents not believing that SHS could risk the pregnant mother to deliver their baby preterm (Table 2).

Only 27.9% correctly answered that the statement was false, 93.3% believed it was true, and 6.7% said it was incorrect. It was observed that 67 parents, accounting for 56.7% of the sample, held positive efficacy beliefs in protecting their children from SHS exposure. Concerningly, when asked about their beliefs regarding their ability to protect their child from SHS, 54.2% of parents said that they will not tell the smoker not to smoke when their children are present and 47.5% said they would not ask somebody to stop smoking in the vehicle when their children were present.

This study found that the parent's age, income, and education level were not associated with the knowledge of SHS. Similarly, parents' age and education level were not associated with their efficacy beliefs in protecting their children from SHS (Table 3). Nevertheless, parents with higher income ($\chi^2 = 7.81, p < 0.05$) were more likely to have positive efficacy beliefs in protecting their children from SHS (Table 4). After controlling for socioeconomic and educational factors, parents who learned about SHS from a physician or nurse in the paediatric department and acquaintances were more likely to have accurate information on SHS and efficacy beliefs in protecting their

children from SHS ($\beta = 0.54, p < 0.05$; $\beta = -0.25, p < 0.05$) (Table 5).

3.3 Relationship between level of knowledge of SHS and the efficacy beliefs in preventing the child from SHS

This study used the Bivariate Pearson's correlation coefficient to assess the correlation between parents' knowledge about SHS and efficacy beliefs in protecting their children from exposure to SHS. The findings suggest a statistically significant, weak positive correlation between the two variables ($r = 0.19, p < 0.05$) (Table 6).

4. Discussion

This study aimed to assess the association between parents' level of knowledge regarding SHS and their efficacy beliefs in protecting their children from this type of exposure. The results of the study indicate that a large percentage of parents have a high level of knowledge and efficacy belief to protect their children from exposure to SHS. Given that the study's respondents were parents of children diagnosed with asthma, it is plausible to assume that they have advanced knowledge of the risk factors for the condition, including exposure to triggers, which includes SHS.

This knowledge will likely strengthen parents' belief in protecting their children from SHS exposure. This argument was based on a finding from a prior study that showed that parents were motivated to quit smoking because they felt they had a responsibility to protect their children from SHS to lower the risk of their children developing asthma symptoms, even though they did not believe that SHS was the primary cause of their children's asthma. (Kanis, Byczkowski, & Mahabee-Gittens, 2014). The high level of knowledge and efficacy beliefs among parents about SHS prevention could also be explained by the fact that, at the time this study was conducted, the Malaysian government had just enacted smoke-free policies in workplaces and public places to reduce exposure to SHS policies garner public attention and discussions, thereby raising awareness about the risks associated with SHS exposure and denormalized public smoking behaviour.

Table 2: Descriptive results of knowledge of SHS and efficacy beliefs in protecting their child from SHS

Knowledge on Secondhand Smoke (SHS)	True n (%)	False n (%)
Smoke from the cigarettes of smokers is harmful to other people around.	118 (98.3)	2 (1.7)
Living with a smoker(s) for many years may increase the risk of getting asthma	114 (95)	6 (5.0)
SHS is more harmful to health than direct smoking.	114 (95)	6 (5.0)
Children are more vulnerable to passive smoking than adults.	116 (96.7)	4 (3.3)
Children of parents who smoke have more respiratory ailments than those of non-smoking parents.	112 (93.3)	8 (6.7)
Pregnant mothers who are exposed to SHS are riskier to experience stillbirth.	98 (81.7)	22 (18.3)
Cigarette smoke contains dangerous chemicals such as carcinogens.	115 (95.8)	5 (4.2)
Efficacy beliefs in protecting the children from Secondhand Smoke (SHS)	Yes n (%)	No n (%)
Do you mind if someone smokes around your children?	109 (90.8)	11 (9.2)
Will you walk away from your children when someone smokes around you?	111 (92.5)	9 (7.5)
Do you think you have the right to ask people not to smoke near your children?	100 (83.3)	20 (16.7)
Will you ask a smoker around to stop smoking when your children are?	55 (45.8)	65 (54.2)
Do you feel that smokers should seek your permission before they smoke around your children?	97 (80.8)	23 (19.2)
Will you ask people around you to stop smoking when you and your children are inside a car or on public transport?	63 (52.5)	57 (47.5)

Table 3: Association between sociodemographic characteristics and level of knowledge regarding SHS among parents of asthmatic children.

Sociodemographic		Level of Knowledge		χ^2	<i>p</i>-value
		Good n (%)	Inadequate n (%)		
Education level	Secondary	16 (64.0)	9(36.0)	1.41	0.236
	Tertiary	72 (75.8)	23 (24.2)		
Monthly Household Income (MYR)	< 2000	11 (73.3)	4 (26.7)	0.84	0.66
	2000 –3000	38 (77.6)	11 (22.4)		
	> 3000	39 (69.6)	17 (30.4)		

* p is significant when <0.05

Table 4: Association between sociodemographic characteristics and efficacy beliefs in protecting their children from SHS.

Sociodemographic	The efficacy beliefs in protecting the child from SHS		χ^2	p-value
	Positive n (%)	Negative n (%)		
Education level				
Secondary	15 (60.0)	10 (40.0)	0.14	0.70
Tertiary	53 (55.8)	42 (44.2)		
Monthly Household Income				
< 2000	4 (26.7)	11 (73.3)	7.81	*0.02
2000 –3000	33 (67.3)	16 (32.7)		
> 3000	31 (55.4)	25 (44.6)		

* p is significant when <0.05

Table 5: Multiple linear regression on the relationship between the sources of information regarding SHS and knowledge of SHS and efficacy beliefs in protecting the children from SHS

Sources of Information	Knowledge		Practice	
	β	p-value	β	p-value
Healthcare Professional	0.543	*0.001	0.518	*0.001
Friends	-0.251	* 0.007	0.251	*0.007
Family	0.056	0.548	0.09	0.934
Media	0.078	0.408-	0.117	0.200

* p is significant when <0.05

Table 6: Relationship between level of knowledge of SHS and the efficacy beliefs in preventing the child from SHS.

	Mean	SD	r	p-value
Knowledge	0.733	0.444	0.195	*0.033
Practice	0.567	0.497		

* p is significant when <0.05

To ensure that the public understands the rationale behind enacting this policy, the government had focused on health campaigns to inform the public about the harmful effects of smoking and SHS. This increased visibility could have contributed to parents' increased knowledge. In support of this claim, a local study by Kuang Hock et al. (2019) revealed that 67.2% of parents supported a total smoking prohibition in public locations because they recognised its health advantages. The results of the study further

elucidated that parents who possessed a lower level of knowledge were more likely to have lower efficacy beliefs in protecting their child from SHS, such as asking the smoker not to smoke in public areas, stopping smoking when someone smokes near their child, and/or removing their child from the area when someone begins smoking around them. Junus et al. (2021) posited that parents with limited health literacy may encounter difficulties in comprehending the potential risks linked to smoking and exposure to SHS. The absence of

comprehension regarding this matter may result in the perception that the behaviour in question is innocuous. Another argument put forth by Orcullo & Hui San, (2016) which posits that individuals may encounter cognitive dissonance when they are faced with information that contradicts their preexisting beliefs or behaviour. To mitigate this discomfort, individuals may employ a coping mechanism in which they downplay the associated risks and maintain a perception of the behaviour as being within the realm of normalcy.

The finding also suggested that there was a misconception that SHS does not raise a pregnant woman's risk of having a stillbirth, despite the Centers for Disease Control and Prevention's (CDC) assertion that pregnant women exposed to SHS are more likely to give birth prematurely. Parents must be aware of this information in order to comprehend how SHS may impact a child not only after exposure but also while the child is still in the uterus (Centers for Disease Control and Prevention, 2020). This is to lower the incidence of preterm births in Malaysia, where around 12.3% of births are premature preterm births annually (Malaysian National Neonatal Registry, 2015).

This study also found a statistically significant association between socioeconomic status and efficacy beliefs in protecting children from SHS exposure, whereby parents with a higher income were more likely to have high efficacy beliefs in protecting their children from the exposure. This is consistent with the findings of a previous study by Nazar, Lee, Arora, & Millett (2016) on socioeconomic inequalities in SHS exposure at home and at workplaces, which revealed that SHS exposure at home is higher among the poor and less educated and decreases with increasing wealth in certain North American and Asian countries, including Malaysia. This finding is in line with the findings of a study being undertaken in Penang indicated that an individual's level of practice may change as their income rises (Rashid, Manan, Yahya, & Ibrahim, 2014). Considering that both studies found that the prevalence of SHS exposure in the household rose as education levels decreased, it is possible that this is a secondary effect of a general decline in educational standards since it's not clear how socioeconomic status could affect how parents protect their children from SHS exposure. This assumption is derived from a sociological

perspective that equates socioeconomic status with a person's social position or class, or their ability to acquire resources such as material goods or knowledge (Chen, Machiorlatti, Krebs, & Muscat, 2019). Furthermore, a study done in Negeri Sembilan claimed that there was no association between a family's monthly household income and how well they dealt with secondary smoke (Suriani et al., 2015). One explanation, however, is that there may be low smoking rates among members of low-income households (Shiva & Padyab, 2008), therefore SHS exposure does not elicit fear or avoidance from them. This assumption might be explained by a psychological phenomenon known as the mere-exposure effect, in which individuals tend to acquire a liking for items just because they are acquainted with them (Chen, Zhang, Zhao, Lee, & Cong, 2016). In this situation, the risky choice provides a prominent role for their efficacy beliefs among the smoking parents in protecting children from SHS exposure, which include the disappointment or regret that might arise from counterfactual comparisons in which they will feel about obtaining different outcomes as the result of various counterfactual comparisons. In this context, the risky choice among parents who are smoking plays a pivotal role in their beliefs about how well they can protect their children from SHS exposure.

This includes the disappointment or regret they might feel if they compare different possible outcomes and find that they would have gotten different results. Consequently, non-smoking parents do not feel emotions at the time of SHS exposure (Loewenstein, Hsee, Weber, & Welch, 2001). With such an argument, it is possible to conclude that socioeconomic position does not have a direct effect on efficacy beliefs in protecting children from SHS exposure. There was however a link between being exposed to tobacco and having a lower socioeconomic status with the possible factors including early exposure to smoking, societal pressure to smoke, lack of access to affordable smoking cessation aids, stress, more exposure to tobacco advertising, and ineffective anti-tobacco messaging (Branstetter, Lengerich, Dignan, & Muscat, 2015).

Subsequently, this study found a statistically significant association between friends, healthcare professionals, and parents' knowledge levels regarding the dangers of SHS. This finding

offers insights into how social networks and healthcare providers can contribute to enhancing parents' understanding of health risks and underscore the significance of fostering collaboration among healthcare practitioners and community networks, thereby advocating for a comprehensive approach to the promotion of health. The previous study on health education showed that 57% of parents prefer to seek advice from health professionals (Alwan, Siddiqi, Thomson, & Cameron, 2010). Other studies corroborate this point of view, indicating that most parents comprehend the information about SHS after hearing it from a healthcare provider during a hospital visit and getting smoking-related advice and education (Smith et al., 2021). In addition, research in Bangladesh demonstrates the significance of public health education initiatives in changing people's perceptions about SHS (Abdullah et al., 2014). Evidence suggests that individuals often rely on their attitudes, beliefs, and actions on the health information they get from credible sources (Chen et al., 2016).

In several studies, the importance of the role of healthcare practitioners in fostering greater health literacy among patients has been emphasised (Bröder et al., 2017; Chen, Hay, Waters, & Kiviniemi, 2016). Patients' health literacy is prioritised since it has been demonstrated in several studies to have a significant effect on self-reported health and to evolve into a crucial element in assuring healthy behaviour, a determinant of health and quality of life (Australian Commission on Safety and Quality in Health Care, 2014). This argument is further confirmed by another study which found a significant association between health literacy and both self-efficacy and health-seeking information (Ghaddar, Valerio, Garcia, & Hansen, 2012). This provides an explanation as to why the parents in this study the parents with less knowledge were more likely to have lower efficacy beliefs in protecting their child from SHS.

5. Conclusion

This research emphasizes the importance of educating parents about the risks of SHS in order to raise their confidence in their capacity to protect their children. We discovered that parents were more likely to have good knowledge of the harmful effects of SHS if they had heard about them from

a physician or nurse in the paediatrics department and friends and family. Meanwhile, we observed that parents with higher monthly household incomes had more confidence in their capacity to protect their children from SHS's harmful effects.

Regular health education on SHS exposure is suggested to improve parents' knowledge of the problem and their belief in their capacity to protect their children from it. In the future, additional studies will be needed to examine how individuals feel about smoking in their homes and in public, as well as how worried they are about the potential health hazards.

5.1 Strengths and weaknesses

This study offers a significant contribution by providing empirical evidence on the impact of social networks and healthcare providers on parents' knowledge. It also provides insights into the development of a strategy to enhance parental awareness regarding the risks associated with SHS exposure. The results of this study can be utilised as a foundation for creating focused interventions that aim to improve parental knowledge within the healthcare setting.

Moreover, the present study underscores the importance of leveraging pre-existing relationships to disseminate essential health information, establishing a financially sustainable and efficient channel for health education. The implications of this study are crucial, not only in individual health outcomes but also in providing insights and exerting influence on the formulation of broader health policies and strategies. The comprehensive research study provides significant findings that offer the potential for enhancing the effectiveness of health promotion delivery by healthcare providers through social networks.

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Conflict of interest

Authors declare no conflicts of interest.

References

- Abdullah, A. S., Driezen, P., Sansone, G., Nargis, N., Hussain, G. A. K. M., Quah, A. C. K., & Fong, G. T. (2014). Correlates of exposure to secondhand smoke at home among non-smoking adults in Bangladesh: Findings from the ITC Bangladesh survey. *BMC Pulmonary Medicine*, *14*(1), 1–11. <https://doi.org/10.1186/1471-2466-14-117>
- Alwan, N., Siddiqi, K., Thomson, H., & Cameron, I. (2010). Children's exposure to second-hand smoke in the home: A household survey in the North of England. *Health & Social Care in the Community*, *18*(3), 257–263. <https://doi.org/https://doi.org/10.1111/j.1365-2524.2009.00890.x>
- Anstey, K. J., & Chen, R. (2018). Invited Commentary: Secondhand Smoke: an Underrecognized Risk Factor for Cognitive Decline. *American Journal of Epidemiology*, *187*(5), 919–921. <https://doi.org/10.1093/aje/kwx378>
- Antunes, H., Precioso, J., Araújo, A. C., Machado, J. C., Samorinha, C., Rocha, V., & Fernandez, E. (2016). Prevalence of secondhand smoke exposure in asthmatic children at home and in the car: A cross-sectional study. *Revista Portuguesa de Pneumologia*, *22*(4), 190–195. <https://doi.org/10.1016/j.rppnen.2015.12.009>
- Australian Commission on Safety and Quality in Health Care. (2014). Health literacy: Taking action to improve safety and quality. In *Australian Commission on Safety and Quality in Health Care* (Vol. 25). Retrieved from <https://www.safetyandquality.gov.au/publications-and-resources/resource-library/health-literacy-taking-action-improve-safety-and-quality>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215.
- Branstetter, S. A., Lengerich, E., Dignan, M., & Muscat, J. (2015). Knowledge and perceptions of tobacco-related media in rural appalachia. *Rural and Remote Health*, *15*(1), 1–9. <https://doi.org/10.22605/RRH3136>
- Bröder, J., Okan, O., Bauer, U., Bruland, D., Schlupp, S., Bollweg, T. M., Pinheiro, P. (2017). Health literacy in childhood and youth: A systematic review of definitions and models. *BMC Public Health*, *17*(1), 1–25. <https://doi.org/10.1186/s12889-017-4267-y>
- Cassia, F., & Magno, F. (2021). Antecedents of professionals' self-efficacy in professional service firms: effects of external source credibility and content quality. *Journal of Business and Industrial Marketing*, *36*(13), 187–198. <https://doi.org/10.1108/JBIM-11-2019-0485>
- Centers for Disease Control and Prevention. (2020). Smoking during pregnancy health effects of smoking and SHS on pregnancies. Retrieved from https://www.cdc.gov/tobacco/basic_information/health_effects/pregnancy/index.htm#print
- Chen, A., Machiorlatti, M., Krebs, N. M., & Muscat, J. E. (2019). Socioeconomic differences in nicotine exposure and dependence in adult daily smokers. *BMC Public Health*, *19*(1), 375. <https://doi.org/10.1186/s12889-019-6694-4>
- Chen, C., Zhang, K. Z. K., Zhao, S. J., Lee, M. K. O., & Cong, T. (2016). The Impact of Mere Exposure Effect on Smartphone Addiction. *2016 49th Hawaii International Conference on System Sciences (HICSS)*, 1507–1514. <https://doi.org/10.1109/HICSS.2016.190>
- Chen, X., Hay, J. L., Waters, E. A., & Kiviniemi, M. T. (2016). Health Literacy and Use and Trust in Health Information. *Physiology & Behavior*, *176*(3), 139–148. <https://doi.org/10.1080/10810730.2018.1511658>.Health
- Earley, S., & Brayden, J. E. (2015). Transient receptor potential channels in the vasculature. *Physiological Reviews*, *95*(2), 645–690. <https://doi.org/10.1152/physrev.00026.2014>

- Ghaddar, S. F., Valerio, M. A., Garcia, C. M., & Hansen, L. (2012). Adolescent health literacy: the importance of credible sources for online health information. *The Journal of School Health, 82*(1), 28–36. <https://doi.org/10.1111/j.1746-1561.2011.00664.x>
- Global Asthma Network. (2014). *The Global Asthma Report Asthma may affect as many as*. Retrieved from http://globalasthareport.org/2014/Global_Asthma_Report_2014.pdf
- Gopal, S. H., Mukherjee, S., & Das, S. K. (2016). Direct and Second-Hand Cigarette Smoke Exposure and Development of Childhood Asthma. *Journal of Environment and Health Sciences, 2*(6). <https://doi.org/10.15436/2378-6841.16.1122>
- Hussein, M. S., Akram, W., Mamat, M. N., Majeed, A. B. A., & Ismail, N. E. B. (2015). Validation of the Malaysian versions of parents and children health survey for asthma by using rasch-model. *Journal of Clinical and Diagnostic Research: JCDR, 9*(4), OC14-8. <https://doi.org/10.7860/JCDR/2015/11995.5801>
- International Agency for Research on Cancer. (2012). *Personal habits and indoor combustions. (IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, No. 100E.)* (Vol. 100). Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK304394/>
- Institute for Public Health, Malaysia, (2019). National Health and Morbidity Survey (NHMS) 2019: NCDs - Non-Communicable Diseases: Risk Factors and other Health Problems. In *Institute for Public Health, National Institutes of Health (NIH), Ministry of Health Malaysia* (Vol. 1). Retrieved from <http://www.iku.gov.my/nhms-2019>
- Jiang, L., Chang, J., Ziogas, A., Deapen, D., Reynolds, P., Bernstein, L., & Anton-Culver, H. (2019). Secondhand smoke, obesity, and risk of type II diabetes among California teachers. *Annals of Epidemiology, 32*, 35–42. <https://doi.org/10.1016/j.annepidem.2019.01.011>
- Junus, S., Chew, C.-C., Sugunan, P., Meor-Aziz, N.-F., Zainal, N. A., Hassan, H. M., Hss, A.-S. (2021). Parental health risk perceptions and preventive measures related to Children’s second-hand cigarette smoke exposure in Malaysia. *BMC Public Health, 21*(1), 1860. <https://doi.org/10.1186/s12889-021-11825-2>
- Kanis, J., Byczkowski, T., & Mahabee-Gittens, E. M. (2014). Motivation to quit smoking in parental smokers in the pediatric emergency department. *Pediatric Emergency Care, 30*(8), 546–551. <https://doi.org/10.1097/PEC.000000000000179>
- Kim, S. (2016). Overview of Cotinine Cutoff Values for Smoking Status Classification. *International Journal of Environmental Research and Public Health, 13*(12). <https://doi.org/10.3390/ijerph13121236>
- Kuang Hock, L., Hui Li, L., Chien Huey, T., Yuvanewary, V., Sayan, P., Muhd Yusoff, M. F., Sumarni Mohd, G. (2019). Support for smoke-free policy among Malaysian adults: findings from a population-based study. *BMJ Open, 9*(2), e020304. <https://doi.org/10.1136/bmjopen-2017-020304>
- Loewenstein, G. F., Hsee, C. K., Weber, E. U., & Welch, N. (2001). Risk as Feelings. *Psychological Bulletin, 127*(2), 267–286. <https://doi.org/10.1037/0033-2909.127.2.267>
- López Blázquez, M., Pérez Moreno, J., Vigil Vázquez, S., & Rodríguez Fernández, R. (2018). Impact of Passive Smoking on Lung Function and Asthma Severity in Children. *Archivos de Bronconeumología*, Vol. 54, pp.

436–437.

<https://doi.org/10.1016/j.arbres.2017.10.016>

- Malaysian National Neonatal Registry. (2015). *A Study of Critically Ill Babies in Neonatal Intensive Care Units*. Retrieved from <http://www.acrm.org.my/mnrr>
- Milanzi, E. B., Brunekreef, B., Koppelman, G. H., Wijga, A. H., van Rossem, L., Vonk, J. M., Gehring, U. (2017). Lifetime secondhand smoke exposure and childhood and adolescent asthma: findings from the PIAMA cohort. *Environmental Health*, 16(1), 14. <https://doi.org/10.1186/s12940-017-0223-7>
- Nazar, G. P., Lee, J. T., Arora, M., & Millett, C. (2016). Socioeconomic inequalities in secondhand smoke exposure at home and at work in 15 low- and middle-income countries. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco*, 18(5), 1230–1239. <https://doi.org/10.1093/ntr/ntv261>
- Ooi, J., Teh, K., Tam, C. L., Sadasivan, S., & Kadirvelu, A. (2014). Passive Smoking: Perceptions and Practices among Urban Working Adults. *International Journal of Research on Internal Medicine & Public Health*, Vol 6, 160–167.
- Orcullo, D. J. C., & Hui San, T. (2016). Understanding Cognitive Dissonance in Smoking Behaviour: A Qualitative Study. *International Journal of Social Science and Humanity*, 6(6), 481–484. <https://doi.org/10.7763/ijssh.2016.v6.695>
- Ratajczak, A., Ratajczak, K., & Feleszko, W. (2018). A cross-sectional study of smoking behaviors and attitudes of parents in pediatric primary care settings. *International Journal of Environmental Research and Public Health*, 15(7). <https://doi.org/10.3390/ijerph15071384>
- Shiva, F., & Padyab, M. (2008). Smoking practices and risk awareness in parents regarding passive smoke exposure of their preschool children: a cross-sectional study in Tehran. *Indian Journal of Medical Sciences*, 62(6), 228–235.
- Smith, C. A., Shahab, L., McNeill, A., Jackson, S. E., Brown, J., & Brose, L. (2021). Harm Perceptions of E-cigarettes among Smokers with and without Mental Health Conditions in England: A Cross-Sectional Population Survey. *Nicotine and Tobacco Research*, 23(3), 511–517. <https://doi.org/10.1093/ntr/ntaa020>
- Zhang, X., Johnson, N., Carrillo, G., & Xu, X. (2018). Decreasing trend in passive tobacco smoke exposure and association with asthma in U.S. children. *Environmental Research*, 166, 35–41. <https://doi.org/10.1016/j.envres.2018.05.022>