ORIGINAL ARTICLE

PREVENTIVE PRACTICE ON SECONDHAND SMOKE AND ITS ASSOCIATED FACTORS AMONG ADULTS IN A SUBURBAN COMMUNITY IN KUALA TERENGGANU

Nik Nor Ronaidi bin Nik Mahdi, Aniza binti Abd Aziz, Rahmah binti Mohd. Amin and Intan Suhana Munira binti Mat Azmi

Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA), Medical Campus, Jalan Sultan Mahmud 20400 Kuala Terengganu, Terengganu Darul Iman, Malaysia.

Corresponding author: Nik Nor Ronaidi bin Nik Mahdi

Email: ronaidimahdi@unisza.edu.my

ABSTRACT

Secondhand smoke (SHS) carries many health risks and is associated with diseases and premature deaths among nonsmoking adults and children. Despite many health promotions and legislative measures executed by the government to protect the public from SHS, the prevalence of SHS exposure is still high. Personal appropriate practices to avoid exposure are crucial especially at home or private area. Therefore, the current study focused on describing individual preventive practices on SHS and determining its associated factors. A cross sectional study was conducted among 250 adults in a village, Kuala Terengganu. Data were collected using self-administered questionnaires. Multiple logistic regression analysis was performed to determine the association between all independent variables and the SHS preventive practice status. The prevalence of SHS exposure was 66.0%. Majority of the respondents (77.2%) has good knowledge on SHS. Nevertheless, despite having good knowledge, a large proportion of them showed poor attitude toward SHS (77.6%) and poor preventive practices (61.2%). Poor preventive practices on SHS were significantly associated with being older (OR_{adj} : 1.0206, 95% CI: 1.0004, 1.0412), female (OR_{adj} : 2.0644, 95% CI: 1.0753, 3.9635), smoker (OR_{adj} : 12.1107, 95% CI: 4.0630, 36.0991), not having existing tobacco-related morbidity (OR_{adj} : 3.6795, 95% CI: 1.1795, 11.4786), and poor attitude towards SHS (OR_{adj} : 4.1871, 95% CI: 2.0955, 8.3665). The preventive practices of SHS among the villagers were poor despite showing acceptable level of knowledge. Hence, health awareness on the potential impact of SHS to the public as well as instilling appropriate behavior for them to avoid SHS and educate smokers need to be emphasized.

KEYWORDS: secondhand smoke, preventive practices, associated factors

INTRODUCTION

Secondhand smoke (SHS) is formed from the burning of cigarettes and other tobacco products and from smoke exhaled by the smoker1. Worldwide, 40% of children, 33% of male non-smokers, and 35% of female non-smokers were exposed to SHS². Additionally, 43% of non-smoking adults in Bangladesh³ and 48.3% of non-smoking household in China⁴ were exposed to SHS. The prevalence of SHS also significantly increased for women and children in poor rural settings of Southeast Asia. In Malaysia, the prevalence of exposure to SHS in rural residents (48.8%) was much higher compared to those living in urban areas (33.3%). Studies carried out in Kelantan, Kedah and Terengganu showed more than half of the participants (53.0%, 51.2% and 50.1% respectively) were exposed. However, only 30.4% of participants in Selangor reported being exposed to SHS⁵.

SHS carries many health risks. There are at least 250 chemicals in tobacco smoke are known to be toxic including hydrogen cyanide, formaldehyde, carbon monoxide, and ammonia⁶⁻⁸. There is no safe level

of SHS exposure and it may cause various illnesses and premature death in non-smoking adults and children⁹. Worldwide, approximately 6 million deaths reported annually due to tobacco-related illnesses while 600,000 deaths were due to SHS exposure^{2,10}. In 2004, SHS exposure was estimated to have caused 379,000 deaths from ischaemic heart disease, 165,000 from lower respiratory tract infections, 36,900 from asthma, and 21,400 from lung cancer². In the United States, exposure to SHS has caused an estimation of 41,000 deaths each year⁶. More than 33,000 non-smokers die every year in the United States from coronary heart disease caused by exposure to SHS⁶.

Knowledge, attitude and preventive practice towards SHS are important components in SHS exposure prevention measures. In general, the majority of Malaysians had adequate knowledge on SHS. Approximately, two-third of Malaysian urban working adults had satisfactory knowledge about passive smoking and the adverse effects associated with secondary smoking¹¹. More than half of both staff members of a public university in Malaysia¹² and housewives in a rural Malay community had

shown to have satisfactory level of knowledge toward SHS¹³. A local study conducted among the community showed that those with good knowledge about matters related to secondhand smoking and smoke free policies will act appropriately towards secondhand smoking¹⁴. This is also supported by studies from other localities that knowledge on SHS and its harmful effects portrayed positive attitudes in avoiding SHS^{15,16}.

On the other hand, the proportion of satisfactory attitude among working women in a public university in Malaysia was only 46.3%¹². This is perturbing as positive attitude has shown to significantly influenced one's self-efficacy to avoid SHS¹⁵. Moreover, a number of studies have reported that despite being disagree with smoking activities around them¹¹, majority of second-hand smokers would not speak up to reprimand smokers because of fear of retaliations¹⁷.

Globally, few actions had been taken to deal with SHS which is detrimental to human. WHO Framework Convention on Tobacco Control (FCTC) was one of the efforts enforced in September 2005. Its implementation recorded evidence of controlling SHS exposure. It was estimated that 2.8 billion people, roughly 40% of the world population had been covered and protected against SHS in public places. However, individual preventive practice still plays a major role in SHS exposure since it mostly occurs at home or private places where legislative actions are not possible 18-20. A study in China showed that a husband with higher cigarette consumption and a lack of smoke-free home rules were found to be significantly associated with higher level of self-reported SHS exposure at home²¹. The situation could be worsened by the fact that exposure of SHS at home might involve children who may suffer the most serious consequences. A study held in Kota Bharu, Kelantan, among primary school children reported that 55.6% of the primary school children who lived with at least one smoker had significant increase in the odds for having respiratory symptoms²².

Hence, by having satisfactory preventive practice on SHS, health threats and consequent hazards to the health of the children can be avoided. Given high prevalence of SHS exposure worldwide, it is possible to devise practical and effective approaches to encourage and empower the community to reduce SHS exposure rates. Till this date, little is known about the factors associated with preventive practice on SHS exposure. Therefore, the current study was aimed to describe individual preventive practices on SHS and determine its associated factors among the adult villagers.

METHODOLOGY

Study Design and Subjects

A cross-sectional study was carried out in a suburban Malay village located in Kuala Terengganu, from 31st December 2017 to 14th February 2018. The village was purposively selected based on their locality considering the positive acceptance and corporation by the village leaders and their committee members. All adults aged 18 years old and above living in the village were included in the study. On the other hand, those who were not willing to participate, absent during the period of survey, do not understand Malay language, terminally ill, or mentally disabled were excluded from the study.

Sample size was calculated using a single proportion formula. Using the rate of SHS exposure as 60% (from a pilot study done earlier in another village) and precision at 6%, the calculated minimum sample size was 257. In view of limited time and subjects, probability sampling was not applied in which all consented adult villagers who fulfilled the study criteria were recruited.

Operational Definitions

Preventive practice on secondhand smoke was this study outcome; refers as the actions taken by the respondents to keep safe of their own health and also surrounding people from SHS. Respondents were asked seven questions to indicate whether they apply the practice in the past one week; an appropriate recent period which show their present behavior and where they are able to best recall. These actions include proactive preventive practice and self-empowerment. The proactive action was defined as an individual ability to control others or intervene a situation in preventing SHS exposure. Self-empowerment refers to ability of oneself to take control of own decision and action to prevent self-exposure to SHS²³.

The preventive practice, knowledge and attitude on SHS were classified into dissatisfactory and satisfactory categories. Educational level refers to the highest formal education achievement by individual. The level of formal education was divided into low level and high level education. The low level education includes those who never been in school until secondary school while the high level education means those graduated from tertiary institution. Smoking status were categorized into; non-smoker which refers to those who have never smoked, or who have smoked less than 100 cigarettes in his/her life time and did not smoke for the past 6 months; smoker refers to those who have smoked 100 cigarettes in his/her life time and who currently smokes cigarettes²⁴. Family history of tobacco-related morbidity refers to any family members claimed by the respondent ever had asthma, cancer or heart disease. Existing tobacco related morbidity refers to whether respondents alleged to have asthma, cancer or heart disease.

Research Tool

A self-administered questionnaire on sociodemographic and smoking factors, family history, existing tobacco related morbidity, knowledge, attitude, and preventive practice on SHS were used. The newly developed questionnaire on knowledge (13 items), attitude (13 items), and preventive practice (7 items) was pretested and validated among adults in a different village in Kuala Terengganu. The internal consistency obtained for attitude and preventive practice items were 0.784 and 0.685 respectively.

The preventive practice, knowledge and attitude on SHS were categorized into dissatisfactory and satisfactory based on cut off points which derived from critical content analysis on each item scores according to researchers' expert point of view. The preventive practice level is categorized into dissatisfactory if the score is less than 21 and satisfactory if the score is equal or more than 21. The knowledge on SHS was categorized into dissatisfactory if the score was less than 11, and satisfactory if the score was 11 and above. the attitude towards SHS was Meanwhile, categorized into dissatisfactory if the score was less than 47 and satisfactory if the score was 47 and above.

Statistical Analysis

The data were analyzed using SPSS version 22.0. Descriptive statistical analysis such as means and standard deviation (SD) for numerical data, and frequency and percentage (%) for categorical data were applied. Both univariable and multivariable analyses were performed to determine the associated factors for preventive practice on SHS. The variables tested were: gender, age, marital educational level, having employment status, monthly household income. smoking status, smoker among family members, family members who smoke inside the house, guests who smoke inside the house, existing tobaccorelated morbidity, family history of tobacco-related morbidity, knowledge and attitude towards SHS. Simple logistic regression was used to select variables for further steps in multivariable analysis. Variables with p-value of less than 0.25 were

included in the multivariable analysis. Selected independent variables were analyzed using forward stepwise likelihood ratio (LR), backward stepwise likelihood ratio (LR) and finally using enter variable selection method to obtain a preliminary model. Multicollinearity and interactions were checked. Then, preliminary final model was obtained. Hosmer-Lemeshow goodness-of-fit test, receiver characteristic (ROC) operator curve, classification table were used to determine the fitness of model. The results were presented with crude and adjusted OR, 95% CI, and p-value. P-value of less than 0.05 was considered as statistically significant.

RESULTS

A total of 250 adult residents in the village aged from 18 to 77 years had consented and participated in the study. There were 165 (66.0%, 95% CI: 60.0, 72.0) respondents reported that they had been exposed to SHS in the past one week. All of the respondents were Malay and more than half of them were female, low educational level, employed, married and having low income (Table 1). About 80% of the respondents were non-smokers (Table 2).

Table 3 describes the level of knowledge, attitude, and preventive practice. The respondents who showed dissatisfactory preventive practices were 61.2%, whilst percentage of dissatisfactory knowledge and attitude were 22.8% and 77.6% respectively (Table 3).

The item analysis of preventive practices showed higher percentages of respondents practiced self-empowerment (Table 4). Most of the respondents (88.4%) chose to sit in smoke-free zones while dining in a restaurant and approximately 85.6% of them had walked away when they noticed someone was smoking nearby. Majority of the respondents admitted that they had done the rest of preventive practices, of which 77.6% of them had advised smokers to quit smoking, and 80.4% of them did not allow anyone to smoke inside their house.

However, only 62.0% of them gave advice when they saw someone smoking in a smoke-free area, and 67.2% of them had stopped someone from smoking near them. Furthermore, on subanalysis among 52 smokers, only 32 (61.5%) of them always abide the rules and regulations of smoke free areas.

Table 1: Socio-demographic characteristics of respondents (n=250)

Variable	n (%)	Mean (SD)
Age (vears)		38.2 (15.0)

Gender Female Male	134 (53.6) 116 (46.4)	
Education level		
Low	161 (64.4)	
High	89 (35.6)	
Occupational Status Employed Unemployed	142 (56.8) 108 (43.2)	
Marital Status		
Married	165 (66.0)	
Single/Divorced/Widow/Widower	85 (34.0)	
Monthly Household Income < RM 2000 ≥ RM 2000	147 (58.8) 103 (41.2)	
Number of Children		2.4 (2.5)

Table 2: Smoking and morbidity factor characteristics of the respondents (n=250).

Variable Smoking Status	
Smoking Status	
Non-smoker	198 (79.2)
Smoker	52 (20.8)
Family members who smoke	129 (51.6)
Family members who smoke inside the house	79 (31.6)
Guests who smoke inside the house	64 (25.6)
Existing tobacco-related morbidity	20 (8.0)
Family history of tobacco-related morbidity	91 (36.4)

In multivariable analysis, age, smoking status, knowledge, and attitude towards SHS were found to have significant relationship with preventive practice on SHS. Table 5 shows the final model of the analysis. The model can be interpreted as follows:

- An adult with one-year increase in age has 1.0206 times the odds to have dissatisfactory preventive practice on SHS (95% CI: 1.0004, 1.0412, P = 0.046).
- A female adult has 2.0644 times the odds to have dissatisfactory preventive practice on SHS as compared to male adult (95% CI: 1.0753, 3.9635, **P** = 0.029).
- An adult smoker has 12.1107 times the odds to have dissatisfactory preventive practice on SHS as compared to non-smoker adult (95% CI: 4.0630, 36.0991, P = <0.001).
- An adult without existing tobacco-related morbidity has 3.6795 times the odds to have dissatisfactory preventive practice on SHS as compared to those with existing tobacco-related morbidity (95% CI: 1.1795, 11.4786, P = 0.025).
- An adult with dissatisfactory attitude towards SHS has 4.1871 times the odds of having dissatisfactory preventive practice on SHS as compared to those with satisfactory attitude toward SHS (95% CI: 2.0955, 8.3665, P = <0.001).

Table 3: Score and level of knowledge, attitude, and preventive practice on SHS among respondents (n=250).

Variable	n (%)	Mean (SD)
Knowledge score		11.52 (1.78)
Satisfactory (score≥11)	193 (77.2)	,

Dissatisfactory (score<11) Attitude score	57 (22.8)	41.69 (5.43)
Satisfactory (score≥47) Dissatisfactory (score<47)	56 (22.4) 194 (77.6)	(4. 4)
Preventive Practice score	., . (,	18.51 (5.07)
Satisfactory (score≥21)	97 (38.8)	,
Dissatisfactory (score<21)	153 (61.2)	

Table 4: Item analysis of preventive practice towards SHS among respondents (n=250).

		Answers			
	ltems	Never	Once	A few times	Every time
		n (%)	n (%)	n (%)	n (%)
1.	I will walk away if someone smokes near me.*	36 (14.4)	15 (6.0)	102 (40.8)	97 (38.8)
2.	I will stop someone from smoking near me.**	82 (32.8)	22 (8.8)	96 (38.4)	50 (20.0)
3.	I will give advice when I see someone who smokes in a smoke-free area.**	95 (38.0)	39 (15.6)	82 (32.8)	34 (13.6)
4.	I will choose to sit in smoke-free zones while dining in a restaurant.*	29 (11.6)	21 (8.4)	88 (35.2)	112 (44.8)
5.	I had advised smokers to quit smoking.**	56 (22.4)	33 (13.2)	109 (43.6)	52 (20.8)
6.	I do not allow anyone to smoke inside my house.**	49 (19.6)	26 (10.4)	58 (23.2)	117 (46.8)
7.	I have searched for information regarding the dangers of passive smoking.*	108 (43.2)	46 (18.4)	69 (27.6)	27 (10.8)

^{*}Item 1,4 and 7 are self-empowerment of own practices which do not involve other person

DISCUSSION

This study discovered two important and exclusive aspects of personal preventive practice among adults which were less reported elsewhere; their behavioral pattern in preventive practice and the possible factors that influence their action in protecting themselves from cigarette smoke. In general, the preventive practices of the villagers were regarded as dissatisfactory. The villagers showed better self-empowerment preventive practice as compared to proactive preventive practice. The present study also revealed five significant predictors for dissatisfactory preventive practice on SHS.

Appropriate personal practice and skill to avoid SHS are very crucial especially among the smokers'

wives and children. The practice to avoid SHS in public places are made possible by laws and policies such as smoke-free zones. However, personal practice to avoid SHS at home or residential areas are mostly individual-driven. In general, the findings from the current study revealed that majority (61.2%) of the respondents were lacked of preventive practice. This shows that they are still not fully empowered. Considering the social and cultural aspects of Malaysian society where smoking in public is common, it is not surprising for a villager to have difficulty in negotiating for smoking restrictions. In addition, our society is often more culturally conservative and more traditional, especially among low socio-economic group²⁵, which makes them hesitate to be proactive such as reprimand a smoker who was smoking in a smoking restricted area.

^{**}Item 2,3,5 and 6 are proactive action practices which involve educating or controlling other people

Preventive practices are crucial in protecting the public from SHS exposure even when they are in smoke free areas. In parallel with this fact, the subanalysis of the current study also showed dissatisfactory compliance on smoke free legislation. Nearly 40% of the smokers did not comply with the rules and regulations of smoke free

areas. In other words, high proportion of smokers who resistant to smoking restrictions will make smoke-free areas less effective in protecting the public from SHS without adequate enforcement efforts from the authority^{26,27}. Besides that, proactive preventive practices such as giving advice and educating others might also improve compliance on smoke free legislation.

Table 5: Associated factors for dissatisfactory preventive practice on SHS among respondents (n=250).

Variables	Crude OR ^a (95% CI)	P - value ^b	Adjusted ORb (95% CI)	<i>P</i> -value ^b
Age (years)	1.0211	0.022	1.0206	0.046
	(1.0030, 1.0395)		(1.0004, 1.0412)	
Gender				
Male	1.0000	-	1.0000	-
Female	0.7110	0.193	2.0644	0.029
	(0.4254, 1.1884)		(1.0753, 3.9635)	
Smoking status				
Non-smoker	1.0000	-	1.0000	-
Smoker	8.1585	< 0.001	12.1107	< 0.001
	(3.1134, 21.3787)		(4.0630, 36.0991)	
Existing Tobacco-Related				
Morbidity				
Present	1.0000	-	1.0000	-
Absent	3.2279	0.016	3.6795	0.025
	(1.2393, 8.4071)		(1.1795, 11.4786)	
Attitude towards SHS				
Satisfactory	1.0000	-	1.0000	-
Dissatisfactory	4.3491	< 0.001	4.1871	< 0.001
·	(2.3130, 8.1776)		(2.0955, 8.3665)	

^aSimple logistic regression; ^bMultiple logistic regression, Hosmer-Lemeshow test **P**-value = 0.768; Area under Receiver Operating Characteristics curve = 0.77, Overall percentage correct = 73.6%

Among the five identified significant predictors, smokers had the highest risk for having dissatisfactory preventive practices on SHS. Similar finding was also reported in previous study among mothers in Taiwan where current smokers were less likely to refuse to enter an environment where SHS was present, to control passive exposure by requesting smokers to stop smoking, or to attenuate exposure when unable to fully withdraw from SHS²⁰. This could be explained by the fact that being smokers themselves, they have more tolerance towards tobacco smoke and more tendencies to under estimate the harmful effect of SHS²⁸. However, the result of the current study also showed situation will be the opposite once they developed tobacco-related diseases as they become more health conscious.

Age was significantly associated with preventive practices on SHS where older respondents had higher odds for dissatisfactory preventive practices. This could be due to the low level of education among elder respondents in the current study. This is also in line with the findings from previous study done in Malaysia that showed older people were less

likely to be aware of harmful effects of second-hand smoke than youngsters²⁹.

Though unexpectedly, the results of this study showed that females had double tendencies to have dissatisfactory preventive practice as compared to male. Similar findings also seen in previous studies done in Taiwan²⁰, China³⁰, and Malaysia³¹, whereby females in general showed dissatisfactory preventive practices on SHS. As a result of culturally defined gender roles, females were prone to accept smoking males and men's engagement in the social practice of smoking to maintain their identities as supportive wives, filial daughters/in-laws and responsible family members who pursue family collective interests at the expense of their own personal beliefs³⁰.

Majority of the respondents also showed dissatisfactory attitude towards SHS despite having satisfactory knowledge or fair level of awareness. This is worrying because this dissatisfactory attitude might affect their self-efficacy in avoiding SHS²⁰ and it was also found to be significantly associated with

preventive practice on SHS in the current study. Low level of satisfactory attitude in this study might explain the low level of satisfactory preventive practices, especially the lack of proactive preventive practices such as giving advice to smoker who was smoking in a smoke free area and stopping someone from smoking near them. These hesitations to voice out against smokers were probably due to the fear of the reprisals¹⁷.

CONCLUSIONS

In conclusion, the preventive practice among majority of the villagers was still unsatisfactory. Thus, a few factors should be considered when drawing up policies aimed at improving the preventive practice on SHS among adults. The authorized parties are recommended to focus more on older people, females, and smokers if a successful policy is to be designed and implemented. Health education to the public should be tailored to motivate and change their attitude towards preventive practices on SHS. Future smoking control initiatives should also empower the public to act and to be firm in defending their right as non-smokers.

ACKNOWLEDGEMENTS

The authors would like to thank all Year 3, Group 4, UniSZA medical students session 2017/2018 for conducting this study. We would also like to take this opportunity to express our sincere gratitude and appreciation to the Chairman of the Village Development and Safety Committee (JKKK) in Kampung Gong Baru and community of Kampung Gong Baru, Kuala Terengganu who had given their heartwarming welcome and full co-operation.

REFERENCES

- 1. Öberg M, Woodward A, Jaakkola MS, Peruga A, Prüss-Ustün A. Global estimate of the burden of disease from second-hand smoke. World Health Organization. 2010.
- Öberg M, Jaakkola MS, Woodward A, Peruga A, Prüss-Ustün A. Worldwide burden of disease from exposure to second-hand smoke: A retrospective analysis of data from 192 countries. Lancet. 2011;377(9760):139-46.
- 3. Abdullah AS, Driezen P, Sansone G, Nargis N, Hussain GAKM, Quah ACK, et al. Correlates of exposure to secondhand smoke (SHS) at home among non-smoking adults in Bangladesh: Findings from the ITC Bangladesh survey. BMC Pulm Med. 2014;14:117.

- 4. Wang CP, Ma SJ, Xu XF, Wang JF, Mei CZ, Yang GH. The prevalence of household second-hand smoke exposure and its correlated factors in six counties of China. Tob Control. 2009;18(2):121-6.
- 5. Institute for Public Health (IPH). National Health & Morbidity Survey (NHMS) 2015. Fact Sheet. 2015.
- 6. United States Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress A Report of the Surgeon General. A Rep Surg Gen. 2014.
- 7. U.S. Department of Health and Human Services. How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General. 2010.
- 8. National Toxicology Program. Tobacco-Related Exposures [Internet]. Report on Carcinogens. Fourteenth Edition. 2016 [cited 2018 Jul 31]. Available from: https://ntp.niehs.nih.gov/ntp/roc/content/profiles/tobaccorelatedexposures.pdf
- 9. U.S. Department of Health and Human Services. The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. 2006.
- 10. World Health Organization. Tobacco [Internet]. 2018 [cited 2018 Aug 1]. Available from: http://www.who.int/news-room/fact-sheets/detail/tobacco
- 11. Ooi JX, Teh KX, Tam CL, Sadasivan S, Kadirvelu A. Passive Smoking: Perceptions and Practices among Urban Working Adults. Int J Collab Res Intern Med Public Heal. 2014;6(6):160-7.
- 12. Suriani I, Nor Afiah MZ, Aidalina M, Nurul Diyana AB, Dhevann Raj R. Knowledge, attitude and practices on secondhand smoking among women who are exposed to secondhand smoking at home and at workplace. Int J public Heal Clin Sci. 2017;4(1):66-76.
- 13. Suriani I, Muhammad Hanafiah J, Minhat HS, Aidalina M, Suhainizam Muhamad S.

- Practices Regarding Secondhand Smoking Among Malay Housewives in Rural Community in Jempol, Negeri Sembilan. Int J Public Heal Clin Sci. 2015;2(1):148-58.
- 14. Rashid A, Manan AA, Yahya N, Ibrahim L. The support for smoke free policy and how it is influenced by tolerance to smoking Experience of a developing country. PLoS One. 2014;9(10):e109429.
- 15. Lin PL, Huang HL, Lu KY, Chen T, Lin WT, Lee CH, et al. Second-hand smoke exposure and the factors associated with avoidance behavior among the mothers of pre-school children: A school-based cross-sectional study. BMC Public Health. 2010;10(606):1-9.
- 16. Ma GX, Shive SE, Tan Y, Toubbeh JI, Fang CY, Edwards RL. Tobacco use, secondhand smoke exposure and their related knowledge, attitudes and behaviors among Asian Americans. Addict Behav. 2005;30(4):725-40.
- 17. Baezconde-Garbanati LA, Weich-Reushé K, Espinoza L, Portugal C, Barahona R, Garbanati J, et al. Secondhand smoke exposure among hispanics/latinos living in multiunit housing: Exploring barriers to new policies. Am J Heal Promot. 2011;25(5):82-90.
- 18. Schwartz J, Graham RB, Richardson CG, Okoli CT, Struik LL, Bottorff JL. An examination of exposure and avoidance behavior related to second-hand cigarette smoke among adolescent girls in Canada. BMC Public Health. 2014;14:468
- 19. Mbulo L, Palipudi KM, Andes L, Morton J, Bashir R, Fouad H, et al. Secondhand smoke exposure at home among one billion children in 21 countries: Findings from the global adult tobacco survey (GATS). Tob Control. 2016;25(e2):e95-e100.
- 20. Lin P-L, Huang H-L, Lu K-Y, Chen T, Lin W-T, Lee C-H, et al. Second-hand smoke exposure and the factors associated with avoidance behavior among the mothers of pre-school children: a school-based cross-sectional study. BMC Public Health. 2010;10(1):606.
- 21. Yang L, Tong EK, Mao Z, Hu T wei. Exposure to secondhand smoke and associated factors among non-smoking pregnant women with smoking husbands in Sichuan province, China. Acta Obstet Gynecol Scand. 2010;89(4):549-557.

- 22. Sharina D, Zulkifli A, Nyi NN. Secondhand smoke exposure at home and respiratory symptoms among primary school children in Kota Bharu, Kelantan. Malaysian J Public Heal Med. 2007;7(2):59-63.
- 23. Nutbeam D, Kickbusch I. Health promotion glossary. Health Promotion International. 1998.
- 24. Centers for Disease Control. Cigarette Smoking Among Adults --- United States, 2006. Morbidity and Mortality Weekly Report. 2007. p. 1157-61.
- 25. Gharaibeh H, Haddad L, Alzyoud S, El-Shahawy O, Baker NA, Umlauf M. Knowledge, attitudes, and behavior in avoiding secondhand smoke exposure among non-smoking employed women with higher education in Jordan. Int J Environ Res Public Health. 2011;8(11):4207-19.
- 26. Abidin EZ, Hashim Z, Semple S. Second-hand smoke in public spaces: How effective has partial smoke-free legislation been in Malaysia? Asian Pacific J Cancer Prev. 2013;14(11):6845-50.
- 27. Ravara SB, Castelo-Branco M, Aguiar P, Calheiros JM. Compliance and enforcement of a partial smoking ban in Lisbon taxis: An exploratory cross-sectional study. BMC Public Health. 2013;13:134.
- 28. Strecher VJ, Kreuter MW, Kobrin SC. Do cigarette smokers have unrealistic perceptions of their heart attack, cancer, and stroke risks? J Behav Med. 1995;18(1):45-54.
- 29. Cheah YK, Teh CH, Lim HK. Factors associated with second-hand smoke awareness in Malaysia. Proc Singapore Healthc. 2018;27(3):148-156.
- 30. Mao A, Bristow K, Robinson J. Caught in a dilemma: Why do non-smoking women in China support the smoking behaviors of men in their families? Health Educ Res. 2013;28(1):153-64.
- 31. Ooi JX, Teh KX, Tam CL, Sadasivan S, Kadirvelu A. Passive Smoking: Perceptions and Practices among Urban Working Adults. Int J Collab Res Intern Med Public Health. 2014;6(6):160-7.