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ORIGINAL ARTICLE

Factors affecting compliance with the Non-Smokers' Health Protection Act B.E.2535: A Case Study of Taxi Cars

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ABSTRACT

Public environment is an important issue for smoking regulation due to the concern of health equity. About 50-60 percent found that public car drivers have risky behavior such as smoking and alcohol drinking which shows that smoking in public transports causes harmful effects to others from exposure to second-hand smoke (SHS). The aim of this present study was to study personal factors, knowledge, attitudes, behaviors and smoking experiences of drivers or passengers and to investigate the correlation between factors and the compliance with the Non-Smoking Health Protection Act B.E. 2535 in drivers and taxi passengers. The data were obtained from self-administered questionnaires responded by 450 taxi drivers and 250 passengers. Statistical analyses were performed for descriptive statistics (demographic data, smoking-related knowledge and attitudes) and Pearson correlation analysis for different factors and smoking behaviors. The results showed that the majority of questionnaire respondents have a sufficient knowledge in law on smoking prohibition and a greater knowledge on harmful effects of smoking. The analysis of factors affecting legal compliance, it is found that attitude to the dangers of smoking was statistically significant ($p < 0.030$) in taxi drivers while smoking behavior of passengers was significantly affected the compliance with the Non-Smoking Health Protection Act ($p = 0.001$). For further smoking control regulation, the governmental legislation on anti-smoking in public vehicles should be continued. The knowledge of harmful health outcomes associated with smoking should also be promoted to change the attitude toward public smoking.

Key words: Second-hand smoking, Smoking ban policy, Attitude, Behavior, Public car

ปัจจัยที่มีผลต่อการปฏิบัติตามพระราชบัญญัติคุ้มครองสุขภาพของผู้ไม่สูบบุหรี่ พ.ศ. 2535: กรณีศึกษารถสาธารณะชนิดรถแท็กซี่

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บทคัดย่อ

สภาพแวดล้อมสาธารณะเป็นประเด็นสำคัญสำหรับการควบคุมการสูบบุหรี่เนื่องจากความกังวลต่อผลกระทบด้านสุขภาพ ประมาณ 50-60 เปอร์เซ็นต์พบว่าผู้ขับขี่รถยนต์สาธารณะมีพฤติกรรมเสี่ยงเช่น การสูบบุหรี่และการดื่มแอลกอฮอล์ ซึ่งแสดงให้เห็นว่าการสูบบุหรี่ในรถขนส่งสาธารณะทำให้เกิดอันตรายต่อผู้อื่นจากการสัมผัสกับควันบุหรี่มือสอง (SHS) การศึกษานี้มีวัตถุประสงค์ เพื่อศึกษาปัจจัยข้อมูลส่วนบุคคล ความรู้ ทัศนคติ พฤติกรรมและ ประสบการณ์การสูบบุหรี่ของผู้ขับรถหรือผู้โดยสาร และหาความสัมพันธ์ระหว่างปัจจัยที่มีผลต่อการปฏิบัติตามพระราชบัญญัติคุ้มครองสุขภาพของผู้ไม่สูบ บุหรี่ พ.ศ. 2535 ในผู้ขับรถและผู้โดยสารรถแท็กซี่ ข้อมูลที่ได้มาจากการตอบแบบสอบถามโดยคนขับแท็กซี่ 450 คนและผู้โดยสาร 250 คน วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา (ข้อมูลด้านประชากรศาสตร์ ความรู้ และทัศนคติเกี่ยวกับการสูบบุหรี่) และการวิเคราะห์สหสัมพันธ์แบบเพียร์สันสำหรับปัจจัยต่าง ๆ และพฤติกรรมการสูบบุหรี่ ผลการวิจัยพบว่า ผู้ตอบแบบสอบถามส่วนใหญ่มีความรู้เพียงพอเกี่ยวกับกฎหมายว่าด้วยการห้ามสูบบุหรี่และความรู้เกี่ยวกับอันตรายจากการสูบบุหรี่ โดยผลวิเคราะห์ปัจจัยที่ต่อการปฏิบัติตัวตามกฎหมายพบว่าการมีทัศนคติที่ไม่คำนึงถึงอันตรายที่เกิดจากการสูบบุหรี่มีนัยสำคัญทางสถิติ ($p< 0.030$) ในผู้ที่ขับรถแท็กซี่ ในขณะที่การสูบบุหรี่ของผู้โดยสารส่งผลการปฏิบัติตามพระราชบัญญัติคุ้มครองสุขภาพของผู้ไม่สูบบุหรี่อย่างมีนัยสำคัญทางสถิติ ($p=0.001$) สำหรับข้อบังคับควบคุมการสูบบุหรี่ในอนาคตรัฐบาลควรมีการออกกฎหมายเกี่ยวกับการห้ามการสูบบุหรี่ในยานพาหนะสาธารณะ ควรส่งเสริมความรู้เกี่ยวกับผลลัพธ์ด้านอันตรายต่อสุขภาพที่เกี่ยวข้องกับการสูบบุหรี่เพื่อเปลี่ยนทัศนคติการสูบบุหรี่ในที่สาธารณะ

คำสำคัญ: การสูบบุหรี่มือสอง, นโยบายห้ามสูบบุหรี่, ทัศนคติ, พฤติกรรม, รถยนต์สาธารณะ

INTRODUCTION

Tobacco use is a risk factor for several chronic diseases, for example coronary heart disease, chronic obstructive pulmonary disease, and many types of cancer.[1-2] The tobacco epidemic is one of the biggest public health threats the world has ever faced, killing more than 7 million people a year. More than 6 million of those deaths are the result of direct tobacco use while around 890,000 are the result of non-smokers being exposed to second-hand smoke.[3] Not Only smoker got the effect from tobacco but young children can affect also.[4-5] Second-hand smoke (SHS) has the same harmful chemicals that smokers directly inhale. There's no safe level of exposure for second-hand smoke (SHS). Second-hand smoke, also known as environment tobacco smoke (ETS), is a general term for any smoke that non-smokers are exposed to. Approximately, 30.5% of adult second-hand smokers (4.2 million) were exposed to tobacco smoke at the workplace. It is reported that there is a greater likelihood of smoking harm than or equal to smokers.[6] To the protection, the goal of the WHO's Framework Convention on Tobacco Control (FCTC), which urges national governments to develop, implement and enforce a set of measures aimed at increasing tobacco control.[7]

Smoke-free policies was used to be an effective way to protect people from the adverse effects of secondhand smoke (SHS) exposure. The development of smoke-free public places—a cornerstone of recent Scottish tobacco control policy—was informed by the growing international consensus about the serious harm caused to non-smoking adults and children from involuntary exposure to SHS.[8] In 1991, Thailand was the first Asian nation to implement strict tobacco control policies and passed a control law under the Non-Smokers' Health Protection Act, B.E. 2535 and Protection Health Act. between 2000 and 2015. According to Sooksriwong (2014), the article provided a review of the law on smoking prohibition in ASEAN Community.[9] It was found that all countries prohibited smoking in public places, schools and hospitals. In 2010, the Ministry of Public Health of Thailand announced the statement of regulatory policy on the names or types of public place that are enforced to provide health protection for non-smokers. Public transport vehicles and their terminals are areas under the Non-Smoking Health Act, B.E. 2535. However, the survey of the National Bureau of Statistics (2011) has reported that smoke smell and cigarette butts were illegally found in public places with smoke-free policy.[10] These data also reflect the effectiveness of law enforcement. Thailand's Department of Land Transport has collaborated with the Department of Disease Control to promote the campaign, implicating as "Non-Smoking builds a smoke-free society." Taxi cab is 100% smoke-free area. "Non-smoking area" sings and stickers were given to public vehicles, enforced by the campaign. The violation of smoke-free regulation could lead to a fine of at most 2,000 bahts for both drivers and passengers as the penalty of noncompliance. Taxi drivers were enforced to follow the regulation at all time even without the passengers. Smoke-free areas protect non-smokers from second-hand smoke that can also be found as residues on various surfaces, such as clothes, carpets, seats, and closed places with no ventilation for several days. Although the law is enforced, many people still exposed to tobacco smoke in public cars.[11-13] This present research study aimed to study personal factors, knowledge, attitudes, behaviors and smoking experiences of drivers or passengers and to investigate the correlation between factors and the compliance with the Non-Smoking Health Protection Act B.E. 2535 in drivers and taxi passengers.

MATERIALS

Sample

This cross-sectional study was designed to collect the data from June to July 2017. A multi-stage stratified sampling method was used as follow: Step 1: stratified sampling by area. The metropolitan area was divided into 7 areas: North, South, East, West, Northeast, Southeast and Southwest. Step 2: random sampling, number of sample was selected from each segment (sub-areas) to cover the entire Bangkok metropolitan area. Additionally, the inclusion criteria for the passenger were based on previous use of taxi service within 30 day. The sample size calculation was based on the formula of Danial (2007),[14] and 10% error was also included from eligible participants. Seven hundred participants (450 taxi drivers and 250 passengers) were recruited in this present research study.

Ethics

The present research study was conducted according to the Declaration of Helsinki (revised version) and had been approved by the committee for research ethics (Social Science) (Certificate of Approval No. 2017/126.2006). The participants were provided with detailed research information, and written informed consent was obtained from each recruited participant. The confidentiality of respondents in this present study was fully provided with the concealment of their identities.

Data instruments and data collection procedure

A structured questionnaire was used to collect data by using checklists and open-ended questions. The questionnaire was divided into 7 sections as follow;

Part 1: Demographic data (9 questions); common introductory information on demographic data.
Part 2: Knowledge of the Non-Smokers' Health Protection Act, B.E. 2535 (5 questions and 14 sub-questions)
Part 3: Smoking behaviors (10 questions)
Part 4: Knowledge on harmful effects of smoking (10 questions)
Part 5: Attitude toward the danger of smoking (14 questions)
Part 6: Compliance with the Non-Smokers' Health Protection Act, B.E. 2535 (1992) (1992) and the punishment of the law (7 questions), and
Part 7: Suggestions and drawbacks in the implementation of Non-Smokers' Health Protection Act, B.E. 2535

The content of questionnaire was validated by a qualified committee, and it was also tested for the reliability before administration to participants. The investigators explained complete details of research project and assurance of participants' confidentiality. The participants were asked to give their written informed consent forms before the administration of questionnaire and data collection. Then, self-check questions and open-ended questions were conducted to obtain the data from all participants. The researchers were checked for completely answered questionnaires at the end of interview sessions.

Data analysis

The data were analyzed using IBM SPSS Statistics for Windows (Version 21 Armonk, NY: IBM Corp., USA). Descriptive statistics were used to examine demographic information, smoking-related knowledge, and attitudes toward smoking. Pearson correlations were used to analyze different factors and smoking behaviors. A level of $p < 0.05$ was considered statistically significant.

RESULTS

This study was conducted using participants of public transit among taxi cabs (450 taxi drivers and 250 passengers). The results showed that the average age of taxi drivers was 47.17 years. The minimum age was 18 years, and the maximum age was 80 years. Most participants were male (98.9%) and married (70%). Most taxi drivers had been working with period of 1 to 10 years (75.9%). One hundred and eighty-three (n = 183) taxi drivers were smoking, and the mean duration of smoking was 11.90 $\pm$ 11.70 years. According to passengers, most participants were female (63.6%), and the mean age was 33.92 years. They had been working in the private sector (31.2%), and 8.8% of them had been smoking. Table 1 shows the participants' comprehension on the Non-Smokers' Health Protection Act, B.E. 2535. The results indicated that these taxi drivers showed a good knowledge on the regulation, while passengers showed a moderate understanding on smoking regulation. The knowledge on harms of smoking was high in both groups of participants. For the compliance to Non-Smokers' Health Protection Act, B.E. 2535, most taxi drivers have eagerly shown non-smoking and/or smoke-free signs. Approximately, 14.9 % of drivers smoked during work hours. 5.8% of them smoked while they were driving with passengers (Table 2). For passengers, 58.5% of them found non-smoking and/or smoke-free signs in clear sight, and 17.2% have ever reminded drivers when they smoked during work hours (Table 3).

According to the attitude of smoking harm, the results showed that 78.0% of taxi drivers and 75.2% of passengers showed the negative attitude toward the danger of smoking. For smoking in public vehicle, 47.7% of taxi drivers have encountered smoking passengers, and 24.1% of passengers have experienced taxi drivers who smoked on the job.

Compliance to the Non-Smokers' Health Protection Act, B.E. 2535 and the legal punishment, the data showed that 97.5% of taxi drivers revealed that they have never been arrested when they did not put up non-smoking and/or smoke-free signs. Furthermore, 99.1% of taxi drivers have never been arrested due to smoking while driving. According to the passengers, the results showed that 98.8% of them had never been informed by taxi drivers on smoking, and 99.6% of them had never been arrested due to smoking in a public taxi vehicle with non-smoking and/or smoke-free signs.

Relationship between knowledge, attitude, smoking behaviors in public taxi car, and compliance to the Non-Smokers' Health Protection Act, B.E. 2535 of taxi drivers and passengers

Pearson correlation analysis was performed to investigate the association between factors and outcomes. The statistical analyses were used to determine the existed relationship between the compliance to the Non-Smokers' Health Protection Act, B.E. 2535, age of smoking, knowledge of the penalty of cigarette smoking, attitude toward the dangers of smoking, and knowledge of the Non-Smokers' Health Protection Act, B.E. 2535. The results revealed that attitudes toward the dangers of smoking were significantly associated with the compliance to the Non-Smokers' Health Protection Act, B.E. 2535, as shown in Table 4. The regression model, only attitude toward the dangers of smoking was significantly related with compliance to the Non-Smokers' Health Protection Act, B.E. 2535 in taxi driver ($p=0.030$) (Table 5). But in the passenger, smoking behaviors was significantly related with compliance to the Non-Smokers' Health Protection Act, B.E. 2535 ($p=0.001$) (Table 6).

According to the recommendation for the compliance to the Non-Smokers' Health Protection Act 1992, the results showed that both groups of respondents recommended strict law enforcement, an increase in well-organized smoking spots or smoking zones in public areas, and explicit and noticeable non-smoking and/or smoke-free signs in the public areas.

DISCUSSION

Thailand was adopted the Non-smokers' Health Protection Act and granted in a wide variety of public places. Public transports, such as taxi car and buses, are very crucial for city people who do not have car. In the metropolitan areas and capital cities, taxi cabs are vital for public transportation to reduce the traffic problems and excessive number of parking cars. According to World Health Organization Framework Convention on Tobacco Control (2005), it required all signatory member countries to adopt measures to protect people from tobacco smoke in indoor workplaces, indoor public places, public transport, and other public places.[15-16]

Smoke-free environment policies limit or eliminate the use of tobacco in certain places. It has been seen that low and middle-income countries effectively and eagerly implemented smoke-free legislation, such as Kenya, Niger, Panama and Thailand.[17-18] In Thailand, smoke-free policies directly affected public areas. Several previous reports showed that people had a high level of knowledge on the non-smoking or smoke-free regulation in public. It mean that a high level of knowledge on Non-Smoking Health Act B.E. 2535 among Thai citizens may be associated with the high level of campaign and advertisement by Thai government and non-government officials to promote public non-smoking policies. Consistent with previous research in the effectiveness of educational campaigns in promoting quitting, the Chinese government tries every means to build its tobacco control publicity and implement various forms of public educational campaigns to enhance smokers' knowledge of the health consequences of smoking. This approach may perceived success of educational campaigns and smoking bans in public places in China.[19] To promote the effectiveness of policy, education to inform the public about the adverse health effects of SHS and effective ways of controlling exposure, can take many forms, including information disseminated via electronic and print media, billboards, and even warnings on cigarette packages.[20]

In this present study, the attitude toward the dangers of smoking was significant among these respondents. People who do not smoke seem to be unaware of the dangers of second-hand smoke (SHS) or third-hand smoke. Our findings indicated that the misunderstanding of harmful effects of tobacco smoke on non-smokers, compared to smokers. The results of this present research study showed that the legal enforcement of public non-smoking areas could be considered as the spillover effect when people have already had some knowledge and attitudes on smoke-free environments, which was consistent with the previous report.[21] In the present day, local smoke-free regulations have a potential to encourage anti-smoking social norms and smoking cessation efforts, particularly among smokers viewing smoking as socially unacceptable in public places. Ravara et al. (2013) indicated that smoking-free regulation would become a social norm when comprehensive smoke-free policies were fully implemented with media campaigns and ongoing community educational efforts to promote public support and awareness.[22] Thailand showed a very strong tobacco control action and recently was legislated in Tobacco Products

Control Act, 2017. The objectives of this legislation were to forbid new smokers, especially youths, and to provide health protection for non-smokers. It was supported from previous study showed that attitudinal shifts among the public and smokers towards smoke-free car law adoption, and to compliance with these laws, may be more likely to occur when people aware the hazardous to health.[23]

CONCLUSION

Tobacco control policies there continue to be challenges in progressing policy and practice on SHS. This present research data demonstrated that taxi drivers showed a greater knowledge and strictly abided by the law more effectively than passengers. Both groups of respondents reported that they hesitated to remind or to inform other people who were violating the enforced non-smoking policy. For the future research and legal implementation, campaigns and advertising methods on hazard and harmful effects of tobacco should be systematically implemented in order to change the attitudes and perspectives of tobacco smokers and non-smokers and to be aware of the negative effects of second-hand smoke (SHS) or third-hand smoke.

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Table 1: Level of knowledge about the Non-Smokers' Health Protection Act, B.E. 2535 and knowledge about harmful effects of smoking

level (score)	Taxi Drivers N (%)	Passengers N (%)
Non-Smokers' Health Protection Act, B.E. 2535		
Low (0 – 10.7)	36 (8)	64 (25.6)
Moderate (10.8 -14.3)	111 (24.7)	106 (42.4)
High (14.4 -18)	303 (63.7)	80 (32)
Knowledge about harmful effects of smoking		
Low (0 – 5)	9 (2)	21 (8.4)
Moderate (6-7)	80 (17.8)	93 (37.2)
High (8-10)	361 (80.2)	136 (54.4)

Table 2: Percentage of compliance of the Non-Smokers' Health Protection Act, B.E. 2535 in taxi driver

Compliance of the Non-Smokers' Health Protection Act, B.E. 2535 in taxi driver	**Yes (%)**	**No (%)**
Show the non-smoking sign clearly	96.4	3.6
Smoking during work hours	14.9	85.1
Smoking while driving with passengers	5.8	94.2
Remind passengers when a passenger is smoking	85.7	14.3
No equipment or facilities for smoking in the car	78.8	21.2

Table 3 Percentage of compliance of the Non-Smokers' Health Protection Act, B.E. 2535 in passengers

Compliance of the Non-Smokers' Health Protection Act, B.E. 2535 in taxi driver	**Yes (%)**	**No (%)**
Found the non-smoking sign clearly	58.5	41.5
smoke while waiting for the taxi	7.7	92.3
smoking on taxi	2.0	98.0
Remind when drivers are smoking	17.2	82.8
Have you ever found a taxi or equipment for smoking?	11.6	88.4

Table 4: Correlation coefficients between the performance scores of Non-Smokers' Health Protection Act, B.E. 2535 and the age of smoking, knowledge of the penalty of cigarettes, attitude toward the dangers of smoking, and knowledge of the Non-Smokers' Health Protection Act, B.E. 2535.

	Taxi driver			**Passenger**		
	N	Correlation coefficients **(r)**	**P-value**	**N**	Correlation coefficients **(r)**	**P-value**
Age (Years)	448	-0.006	0.904	248	0.020	0.760
Duration of smoking (years)	183	-0.122	0.101	18	-0.122	0.631

	Taxi driver			Passenger		
	N	Correlation coefficients **(r)**	**P-value**	**N**	Correlation coefficients **(r)**	**P-value**
Knowledge of the Non-Smokers' Health Protection Act, B.E. 2535 (1992)	450	-0.011	0.816	250	0.087	0.169
Knowledge about harmful effects of smoking (score)	450	-0.073	0.125	250	0.036	0.570
Attitude to the dangers of smoking (Score)	450	**0.125**	0.008*	250	**0.174**	0.006*

p<0.01

Table 5: Multiple regression analysis of the variables with the Non-Smoking Health Protection Act B.E. 2535 in taxi drivers and passengers.

Variables	Compliance with the Non-Smoking Health Protection Act B.E. 2535			
	Unstandardized Coefficients (b)	Standardized Coefficients (B)	t	p-value
Age (years)	-0.001	-0.015	-0.323	0.747
Smoking Behavior	-0.077	-0.049	-0.981	0.327
Knowledge of the Non-Smokers' Health Protection Act, B.E. 2535 (1992)	0.003	0.011	0.231	0.817
Knowledge about harmful effects of smoking (score)	-0.044	-0.072	-1.479	0.140
Attitude to the dangers of smoking (score)	**0.028**	0.108	2.178	**0.030**

p<0.05

Table 6: Multiple regression analysis of the variables with the Non-Smoking Health Protection Act B.E. 2535 in passengers.

Variables	Compliance with the Non-Smoking Health Protection Act B.E. 2535			
	Unstandardized Coefficients (b)	Standardized Coefficients (B)	t	p-value
Age (years)	-0.001	-0.008	-0.131	0.896
Smoking Behavior	**-0.585**	-0.212	-3.220	**0.001**
Knowledge of the Non-Smokers' Health Protection Act, B.E. 2535 (1992)	0.015	0.070	1.087	0.278
Knowledge about harmful effects of smoking (score)	0.001	0.002	0.023	0.981
Attitude to the dangers of smoking (score)	0.022	0.090	1.346	0.180

p<0.01

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