

ASSESSMENT OF KNOWLEDGE AND PERCEPTION OF ADVERSE HEALTH EFFECTS ASSOCIATED WITH SELF-PREVENTION FROM AIR POLLUTION IN TRAFFIC POLICEMEN IN BANGKOK, THAILAND

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ABSTRACT:

Background: As a result of expansion and development in Bangkok, traffic policemen have higher risks to expose air pollution. Air pollution results from several pollutants which mainly caused by road vehicles. This study aimed to examine the association between knowledge and perception of adverse health effects. In addition, self-prevention from air pollution of traffic policemen in Bangkok is also studied.

Methods: A cross-sectional study was carried out by random sampling and self-administrated questionnaires from 223 traffic policemen worked in interesting area as Jatujak, PomPrapSattruPhai, Din Daeng and Rat Burana district, Bangkok, Thailand. The data were analyzed by using descriptive statistics and analytical statistics in terms of the Chi-square test and Fisher Exact Test.

Results: The result indicated that the respondents were 100% male and 45.7% aged between 41-50 years, 44.4% in Bachelor's degree and found that 72.2% of respondents had not received information, and 74.4 % had not been trained. Most of respondents had knowledge at moderate level 48.4 %. A minority of respondents had the perception of adverse health effects at poor level 2.7 % and had self-prevention behavior from air pollution at poor level 3.1 %. Furthermore, the knowledge was associated with socio-demographics characteristics in terms of education level, frequency of exercise, chronic disease, had got information about air pollution and health effect and had been trained on prevention of air pollution at *p*-value as 0.011, 0.001, 0.028, 0.011 and 0.005, respectively. Knowledge of respondents associated with perception of adverse health effect (*p*-value = 0.001) and also associated with self-prevention behavior from air pollution (*p*-value <0.001). Last, the perception of adverse health effects associated with self-prevention behavior from air pollution (*p*-value <0.05).

Conclusion: Government agencies and related organizations shall provide traffic policemen with proactive programs in terms of knowledge about air pollution prevention behavior and enhance health effect perception from air pollution in order to have more appropriate prevention behaviors.

Keywords: Knowledge, Perception, Self-prevention, Air pollution, Traffic policemen, Thailand

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INTRODUCTION

Bangkok is the capital city of Thailand. It is also known in Thai as Krung Thep Maha Nakhon.

Bangkok has the highest population in Thailand. Nowadays, Bangkok has an expansion of industry and the tourism because there are many attractions and landmarks as the center of communication. In 2015, there was 9,018,594 vehicles registered with Bangkok Metropolitan Administration [1].

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Therefore, the transportation of vehicles generated the dust on the road more blown becoming suspended particles in the air (PM_{2.5} and PM₁₀), the roads in Bangkok have filled with suspended particles caused by road vehicles.

From the total dust monitoring in Bangkok, it found that 18 routes had PM₁₀ concentration exceeding standard level while 9 routes had total dust concentration and 1 route had PM_{2.5} concentration exceeding standard level in 2013 [2]. The suspended particles had an enormous impact on human in several aspects as a black smoke from the incomplete combustion of a motorcycle engine. This also caused allergies that reduce resistance to disease, headache, blurred vision, nausea, vomiting, and fatigue [3, 4].

From these effects, it demonstrated that the people working in the high risk area especially the traffic policeman had health effect from air pollution. Traffic policemen had a high risk to exposure suspended particles because they were responsible for overseeing the state's security and orderliness of traffic as well as having the duty on the road regularly. Traffic policemen worked 8 hours per day and 5 days per week that led to health hazard. Moreover, some traffic policemen worked more than 10 - 14 hours per day and 46% of traffic policemen worked 7 days per week that could be face with suspended particles while working on the road in the rush hour traffic congestion [5].

As the result, the researcher was interested in knowledge and perception toward self-prevention of traffic policemen in Bangkok which is considered of having the most traffic congestions. Nevertheless, few studies were examined the knowledge and perception toward self-prevention of traffic policemen principally in Bangkok, which are presently confront the suspended particles pollution situation (PM_{2.5} and PM₁₀).

The objectives of this study were to assess level of knowledge, perception and self-prevention associate with the working area in traffic policemen and explore the association between each variables. Furthermore, this study also provided recommendations to improve the behavior of self-prevention from the suspended particles pollution as PM_{2.5} and PM₁₀ in traffic policemen.

MATERIALS AND MERHODS

This study was a cross-sectional study in interesting area as Jatujak, PomPrapSattruPhai, Din Daeng and Rat Burana District. There were 223

traffic policemen assessed the factors that associated with the traffic policeman. This study set 2 aspects of inclusion criteria as the traffic policemen who had the responsibility to work at outside of police station and who was age in the range of 20 - 60 year olds as well as 3 exclusion Criteria as the traffic policemen who were responsible for sedentary work in offices, who never worked on the traffic duty that could be assumed they were not exposed to traffic-related pollution, and who had a duration of working as policeman less than 1 year. Sampling collection process, the ethic was approved the consideration part and passed the permission to be collected the data. Moreover, the questionnaires were pilot tested from 30 Bangkean traffic policemen for validation and collected real data from policemen who work at Jatujak, PomPrapSattruPhai, Din Daeng and Rat Burana district in Bangkok. Lastly, the data were analyzed by using SPSS 16.0 version to interpret data for final report.

Research instrument

The questionnaire comprises four parts, 1) Sociodemographic that represent fundamental aspects that affect exposure, susceptibility, or disease diagnosis and treatment focused on general information [6]. 2) The knowledge that means the basic elements that the policemen can learn from experience or training enable them to express their own self-prevention [7]. Knowledge used 1 score as correct answer and 0 score as wrong answer. The total scores were 15 that could be classified into 3 groups as low (0 - 8 Scores), moderate (9 - 12 Scores) and high (12 -15 Scores) by using Bloom's cut off point-60%-80% [8]. 3) The perception of adverse health effect that related to individual opinion, attitude, thought and belief including risk of diseases [9, 10]. The perception used Likert's scale: 1, 2, 3, 4, 5 with 5 was the most score in the positive meaning. The perception had scores varied from 1 - 75 that were categorized into 3 levels as poor (1 - 44 Scores), moderate (45 - 59 Scores) and good (60 - 75 Scores) [11]. 4) The self-prevention means individual target group express their behaviors in order to air pollution prevention which concentrates personal protective equipment, personal hygiene and preventive behaviors [12]. The self-prevention had both positive and negative point of views as four rating scales. The self-prevention had scores varied from 1 - 100 and were categorized into 3 levels as were categorized into 3 levels as poor (1 - 59 Scores), moderate (60 - 80 Scores) and good (81 - 100 Scores) [13].

Table 1 Respondent's level of knowledge, perception scores and self-prevention scores (n = 223)

Knowledge level	No. (%)	Perception score	No. (%)	Self-prevention score	No. (%)
Low	38 (17.0)	Poor	6 (2.7)	Poor	7 (3.1)
Moderate	108 (48.4)	Moderate	118 (52.9)	Moderate	120 (53.8)
High	77 (34.5)	Good	99 (44.4)	Good	96 (43.0)

Method of validity testing for structured questionnaire

The validity was checked by three experts and adjusted using Item – Objective Congruence (IOC) formula [14]. The IOC formula was used for appropriate questions identification. The question of questionnaires was corrected and adjusted if the IOC value was found to be less than 0.05. Moreover, the validity of this study also used the criterion as 1) How to conduct KAP survey [15]. 2) OSHA Respirator Medical Evaluation Questionnaire (Mandatory) [16]. 3) Descriptive study to assess the knowledge, attitude and practice among traffic policemen to protect against health hazards in Bangalore City [17].

Method of reliability testing for questionnaire

All the questions were tested before used. The questions were tested by using Kuder–Richardson formula (KR-21) [18] and Cronbach's Alpha [19] with the following result; knowledge question (KR-21) = 0.87, perception questions (Cronbach's Alpha) = 0.83 and self-prevention (Cronbach's Alpha) = 0.84.

Data analysis

The data were analyzed by using SPSS 16.0 version statistics software to find descriptive statistics and analytical statistics as Chai-square and Fisher Exact Test to assess the relationship between socio-demographic factors, the knowledge factors, the perception, and self-prevention at the 0.05 significant level [20].

Ethical consideration

This study was approved under the guideline of College of Public Health Sciences. The study was done with the permission of the Ethic Review Committee. Study Title NO. 113/59, COA NO. 128/2016, Date of Approval: 12 July 2016.

RESULTS AND DISCUSSION

The finding suggested that most of respondents had age ranged from 41 – 50 years (45.7%), bachelor's degree (44.4%), worked hour per day 8 - 11 hours (48.9%) that average 6.2 ± 3.7 hours, worked 6 day per week (46.6%), exercised 1-3

days/week (54.7%), did not have chronic disease (74.4%), did not have smoking behavior (57.0%), and the respondents that had smoking behavior about 1-10 rolls per day. From these results, it showed most of policemen in the interesting area worked on the road more than 6 hour and worked more than 5 days per week that may lead to more an opportunity to expose the pollutants in policemen. Moreover, some policemen also had smoking behavior. Thus, local authority should have protective measurement as job and working area rotation which prevent the policeman from the same highly risk area. The survey found that the respondents mostly policemen had not ever got information about air pollution and health effect from government organizations during one year ago and had not ever trained on self-prevention about air pollution from government organizations during one year ago as 72.2 % and 74.4%, respectively. Moreover, the respondents generally got moderate knowledge level, moderate perception scores and moderate self-prevention behavior scores as Table 1.

From Chai-square test, it found that there were partially association between socio demographic factors and self-prevention as education levels, frequency of exercise, congenital disease, had got information about air pollution and health effect and had trained on prevention between air pollution and self-prevention with *p*-value 0.011, 0.001, 0.028, 0.011 and 0.005 respectively. The high educated persons are more likely to express concerns about air pollution, which means they are more sensitive to the change of air quality at the same time [21]. The higher educated people were more likely to recognize air pollution harmed their health and more good practice than the referent categories [22]. The previous study also showed that working experience had association with the level of self-prevention [7]. Consequently, the conclusion of the association between socio-demographic factors and self-prevention as shown in Figure 1.

As for Table 2, there was association between knowledge and perception (*p*-value < 0.05). Previous studies also shown that there were slightly positive correlation between knowledge and attitude

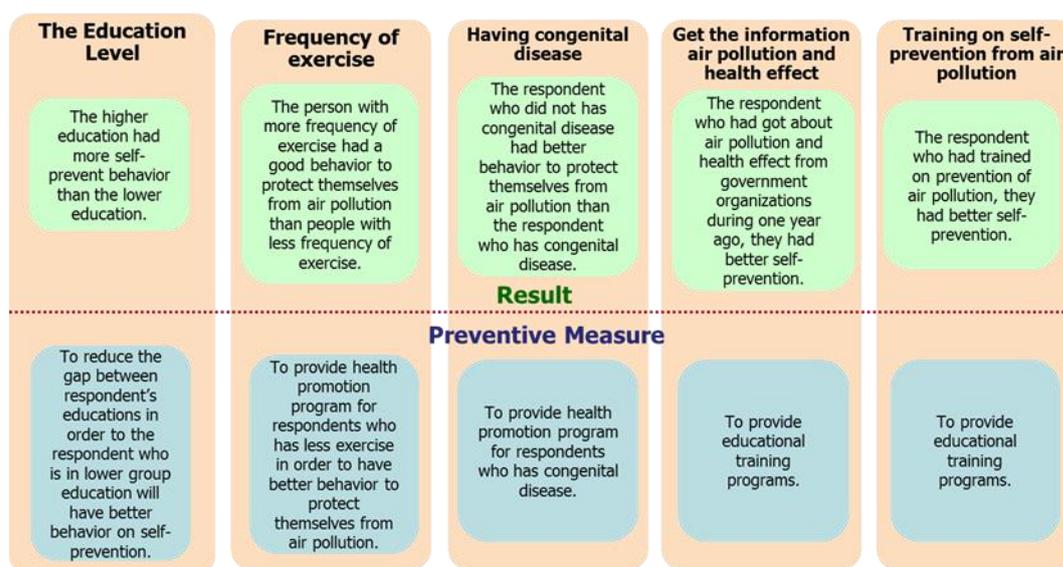


Figure 1 Conclusion of the association between socio demographic factors and self-prevention

Table 2 The relationship between knowledge and perception towards self-prevention of traffic policemen in Bangkok (n = 223)

Demographic variables	Perception			χ^2	p-value
	Poor No. (%)	Moderate No. (%)	Good No. (%)		
Knowledge					
Low	5 (13.2)	19 (50.0)	14 (36.8)	20.99	0.001*
Moderate	0 (0.0)	62 (57.4)	46 (42.6)		
High	1 (1.3)	37 (48.1)	39 (50.6)		

* Significant at the 0.05 level (2-tailed)

Table 3 The relationship between knowledge and self-prevention of traffic policemen in Bangkok (n = 223)

Demographic variables	Self-prevention			χ^2	p-value
	Poor No. (%)	Moderate No. (%)	Good No. (%)		
Knowledge					
Low	19 (50.0)	16 (42.1)	3 (7.9)	17.78	0.001*
Moderate	55 (50.9)	47 (43.5)	6 (5.6)		
High	17 (22.1)	50 (64.9)	10 (13.0)		

* Significant at the 0.05 level (2-tailed)

of children's respiratory health in Shanghai, China (spearman rank correlation were 0.40 at p -value < 0.01) [21]. The knowledge was considered to be beneficial to attitude and the high levels of perception translated into a greater likelihood of engaging in protective practices [23]. From the study, it showed some respondent had poor perception with misunderstood about the health impacts from air pollution that could be only unhealthy people and the air pollution could not impact on the respiratory system because the respiratory system had immune system. Moreover, some respondents also misunderstood that dust

could not cause adverse health effect such as cells damage in the respiratory system [24]. Thus, the traffic policemen should acquire the information and get training about air pollution and health effect that provide them with more good perception.

From Table 3, there was association between knowledge and self-prevention (p -value < 0.05). Other studies found that there was a relationship between knowledge and practice among traffic policeman to protected against health hazards generated by traffic air pollution in Bangalore City [17]. From the study, it showed some respondent did not know about the benefit and how to select of

Table 4 The relationship between perception and self-prevention of traffic policemen in Bangkok (n = 223) from Fisher Exact Test

Demographic variables	Self-prevention		p-value
	Poor No. (%)	Moderate and Good No. (%)	
Perception			
Poor	5 (83.3)	1 (16.7)	0.043
Moderate and Good	86 (39.6)	131 (60.4)	

respiratory protective equipment as well as some respondent did not get the information about how to properly wear a mask from government and the private sector. So, these problems that can bring about the poor self-prevention. The high levels of knowledge translated into a greater likelihood of engaging in protective practices [23].

As the result, the Fisher Exact Test in Table 4, it also showed that there was signification between perception and self-prevention (p -value < 0.05). This association corresponded with the perceived self-efficacy and perceived benefits were positively significantly correlated with behaviors of health promoting to prevent environmental lung diseases [25]. From the study, it showed some respondents had low perception which resulted in poor self-prevention because they perceived that it was not necessary to use face mask because it was able to little filter dust. Thus, related organizations should provide awareness program and training as well as provide adequate respiratory protective equipment (Face Mask) to make traffic policemen have more appropriate prevention behaviors.

CONCLUSION

This study indicated the traffic policemen should be gain the knowledge about air pollution and health effect from air pollution in order to induce the positive perception and good practice to prevent themselves from air pollution. The study therefore recommendations for the policy and implementations in terms of the local authority should operate to enhance knowledge and awareness of traffic policeman [10, 26]. Moreover, health education organizations should reduce the knowledge gap by organized and providing curriculum training program about air pollution, health effect and self-prevention. The curriculum training program have to appropriate for each age, work experience and rank order as well as the training programs should emphasis mainly on increasing the awareness of traffic policeman. Prevention and control disease department also

should support traffic policemen know the prevalence of occupational disease's traffic policemen and provide the air pollution information in order to encourage traffic policemen. Finally, Government should regulate and promote various activities to resolve the environmental problems. Environmental issues are regularly tracked continuously and inform the progress to the public from time to time [27].

Further study

This study was reported on knowledge and perception of adverse health effects associated with self-prevention from air pollution in traffic policemen, Bangkok. Future recommended should be focused on health disease, health risk checkup especially lung capacity and behavior change to improve the reliable and effective implementation program to avoid adverse health effects. Moreover, further study may concern about the type of face mask that the policeman should to wear and may focus on every traffic pollutants that harm the respiratory system.

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