SOCIOECONOMIC-DEMOGRAPHIC FACTORS AND HEALTH-RISK BEHAVIORS IN THE THAI POPULATION

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ABSTRACT

Background: Health behaviors have important consequences for both the quality and length of life by influencing disease risk and disease outcomes. In Thailand the leading cause of death in both men and women is non-communicable disease (NCD) which could prevented in part by healthy behaviors. The objectives of this study were to identify the existing health-risk behaviors in the Thai population and to analyze associations between socioeconomic-demographic factors and health-risk behaviors.

Methods: The data from the 2010 Evaluation of Health Promotion and Sports in Local Regions in Thailand was analyzed to response the research objective. The socio-economic-demographic factors included gender, age, marital status, education, occupation and region; the health-risk behaviors comprised smoking, alcohol consumption and non-exercise. Descriptive analysis and logistic regression modeling were implemented to analyze the relationships between socioeconomic-demographic factors and health risk behavior.

Results: There were 8,617 respondents, including 3,329 women (38.6%), and 5,288 men (61.4%) which age average was 52 (Min=15 years; Max=86 years; SD=14.8 years).More than half of respondents reported educational attainment of primary school (62.2%). Most subjects were married (68.2%). Farming accounted for the largest occupation category (25.3%) and mostly lived in the northeast region (25.2%). The logistic regression analysis found that male and ever married had greater adjusted odds ratios of smoking, alcohol consumption and non-exercise than others. Farmers, wage laborers and younger respondents had higher odds of smoking and drinking alcohol than others, while government officers had the highest non-exercise practice. People who live in southern region had the greatest odds of smoking. The northern population had the highest odds of alcohol consumption. Moreover, people with higher education had lower adjusted odds ratios for the three types of health-risk behaviors.

Conclusion: Health-risk behavior was statistically significantly associated with socioeconomic-demographic factors. These findings can help inform public policy regarding health-risk behaviors. Specifically, the findings suggest that health promotion policy should be oriented towards males, younger population, ever-married, low educational attainment, farmers, and wage labor workers. Policy should also take geographic differences in risk factors into account.

Keywords: Health-risk behaviors, Socioeconomic, Demographic, Thailand

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INTRODUCTION

A decrease risk of morbidity and mortality basically depends on individual health behaviors. The contribution of health-related behaviors to individuals' health status has been the object of countless medical and epidemiological studies because health-related behaviors are significantly associated with morbidity and mortality [1, 2]. In particular, four behaviors have emerged as major determinants of individuals' health status: smoking, alcohol consumption, physical activity, and diet [3]. Moreover, World Health Organization (WHO) [4] suggests that investigating the determinants of such behaviors should be a primary public health goal, since it might help to inform targeted policies for reducing health inequalities and advancing people's health.

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In Thailand, The Bureau of Policy and Strategy, Ministry of Public Health [5] reported that the leading cause of death in both men and women is disease of the heart followed by Hypertension and cerebrovascular disease which could prevent by doing recommended exercise and avoiding the disadvantage behavior such as drinking alcohol and smoking [2, 6]. However, The survey of the cigarette smoking and drinking behavior of the Thai population, the national statistics office (NSO) [7] showed that about one-third of Thai population who aged 15 years old and over were drinking alcohol. The prevalence of smoking behavior of Thai population slightly increased from 19.9% in 2013 to 20.7% in 2014. Regard to gender, male smokers increased from 39.0% to 40.5%, while female smokers also increased from 2.1% to 2.2% [7]. Moreover, NSO has conducted the survey in 2011 found only one-fourth of Thai population had regular exercise [8].

As regards social determinants, empirical research has generally found that socioeconomic factors play a key role in shaping not only health inequality but also non-healthy behavior, such as lack of physical activity, smoking and alcohol consumption [9-12]. Up to present time, it is still a big issue about the influence of socioeconomic-demographic factors toward health behaviors. The general conclusion is that people with lower socioeconomic status (SES) have lower healthy behaviors. Many studies have been found that lower SES is associated with higher risk of unhealthy behaviors [10, 12]. However, several scholars disagree with the argument that people with higher prevalence of risky behaviors are belong to disadvantaged SES groups. They argued that it could explain more than the inability in expense for advantage products and services, due to exercise such as walking is least costly and buying cigarette needs more expenditure [13, 14].

However, it is still challenging to study the heath behaviors disparity across socioeconomic-demographic factors, particularly in nationally representative samples. Thus, this paper investigated the health-risk behaviors differential across socioeconomic-demographic factors in Thailand. The study purposes are first, to identify the existing health-risk behaviors among Thai population and secondly, to study the association between socioeconomic factors and health risk behaviors.

MATERIALS AND METHODS

This paper employed data from the 2010 Evaluation of Health Promotion and Local Sports in Regions [15]. The purpose of the evaluation was to evaluate the implementation of health promotion and local sport campaign operating by Department of Local Administration, Ministry of Interior, Thailand and also to investigate underlying factor in establishing a network of local fitness and sports for health. This survey conducted by the Institute for Population and Social Research (IPSR), Mahidol University. The questionnaire included residential basic information, health related behavior, and self-reported health status. Particularly for this paper, IRB submission forms were submitted and approved by Institute for Population and Social Research, Mahidol University-Institutional Review Board (IPSR-IRB) which received documentary proof: COA. No. 2014/1-1-36.

This survey applied a multi-stage stratified design. In order to ensure a representative sample of the population, the sampling process involved several steps. Firstly; 20 provinces were selected from six sub-regions which reflect the different social, economic and ecological conditions of Thailand. Next, two districts each were selected from the 20 provinces. Thirdly, two municipalities each were selected from the 40 sampled districts. The last stage, the author selected two villages each were selected from 80 municipalities and collected the information from every household in the villages. The total household in the survey were 8,886 households while the total sample universe is around 27,409 cases. however, this paper selected only the person who answered the questionnaire and aged 15 years old and over because the author investigated health risk behavior such as smoking, alcohol consumption and non-exercise behavior that require retrospective self-reports about engaging in these behaviors. It could be more accurate and reliable from the first source than using the information answered by other family members [16]. Moreover, someone who aged 15 years old and over would have their own independent thinking, and have the freedom to choose an activity that they prefer [17]. Underlying the sampling frame, a selection bias emerged as there were more male respondents than female respondents. This is because the questionnaire was typically answered by the head of the household. In Thailand, the head of the household is usually a man.

The descriptive analysis and logistic regression were employed in this study. The statistical analysis was fitted by using STATA. The dependent variable was health risk behaviors. There were smoking, alcohol consumption and non-exercise. The coding of each category as follows; smoking and alcohol

Table 1 Percentage Reporting Health-risk Behaviors (smoking, alcohol consumption and no exercise) by Socioeconomic-demographic Factors. (n= 8,617)

Factors	Smoking (%)	Alcohol (%)	No Exercise (%)	N
Gender				
Male	42.3	44.5	52.4	5,288
Female	6.0	9.6	50.1	3,329
Age (years)				
Under 20	17.5	17.5	29.8	85
20-39	34.8	39.3	51.3	1,556
40-59	31.1	35.8	51.7	4,281
60-79	21.1	20.4	51.1	2,327
80 or over	16.2	12.1	58.8	396
Marital Status				
Single	18.2	25.5	44.1	944
Married	34.0	36.5	48.6	5,873
Ever married	48.4	57.8	55.8	1,800
Education				
No education	54.8	51.4	71.8	660
Primary school	49.7	40.0	54.3	5,359
High school	31.7	38.9	49.2	719
Vocational certificate	23.4	32.1	41.6	1,039
University or over	17.0	29.2	32.1	840
Occupation				
Unemployed	23.5	35.3	48.5	1,106
Student	11.1	7.8	30.0	90
Farming	39.0	38.8	45.0	2,177
Business owners	20.3	27.7	53.5	1,815
Government worker	14.2	13.1	58.3	881
Private officer worker	15.0	21.3	55.1	247
Wage laborer	37.4	36.6	48.0	1,906
Other	14.9	18.5	45.1	395
Region of Residence		36.6		
Central	23.8	28.1	31.5	1,225
Eastern	28.3	28.0	69.0	1,369
Northeastern	36.5	36.7	46.6	2,170
Western	41.9	30.6	72.8	1,443
Northern	17.3	39.3	53.6	894
Southern	48.8	25.5	46.8	1,516
N	**28.3**	**31.1**	**51.5**	**8,617**

consumption is classified as "yes" (1) and "no" (0), while no-exercise was coded as "no exercise" (1) and "exercise" (0). While the predictor's variables were gender, age, education, marital status, occupation and region. The hypothesis testing was run for each risk behaviors. The 5% significant level was applied to consider the null hypothesis rejection.

RESULTS

Sample characteristic

The study sample of 8,617 included 3,329 women (38.6%), and 5,288 men (61.4%). Average age was 52 years (SD=14.8 years). More than half of respondents reported educational attainment of primary school (62.2%). Most subjects were married (68.2%). Used-to-be married accounted for 20.9%, and single 11.0%. Farming accounted for the largest occupation category (25.3%), two-thirds were living in an urban location and mostly lived in the northeast region (25.2%).

With regard to health risk behaviors were classified by socioeconomic-demographic factors shown in Table 1.

Gender: Males were more likely to smoke and consume alcohol than females, but females tend to exercise more than males. This result might be affected by selection bias; most of the respondents were head of household who were male.

Age: The data found that most of the respondents who had the three highest health risk behaviors aged between 20-39 year olds. The study found 17.5 % of respondents who aged less than 20 years old had started smoking and drinking alcohol.

Table 2 Adjusted odds Ratios (OR) and 95% confidence intervals (95% CI) of Relationships between Health Risk Behaviors and Socioeconomic-demographic Factors

Factors	Adjusted odds Ratios (95% Cl)			
	Smoking	**Alcohol consumption**	**No-Exercise**	**Smoking, alcohol consumption and no-exercise**
Gender (Reference : Male)				
Female	0.083*(0.070-0.099)	0.135*(0.117-0.155)	0.835*(0.752-0.927)	0.295*(0.263-0.330)
Age	0.980*(0.976-0.985)	0.973*(0.969-0.977)	0.999(0.995-1.002)	0.988*(0.984-0.992)
Marital status (Reference : Single)				
Married	1.120(1.013-1.233	1.108(1.005-1.281)	1.168(0.991-1.376)	1.139(0.944-1.270)
Ever married	1.680*(1.307-2.159	1.362*(1.084-1.712)	1.442*(1.192-1.744)	1.611*(1.319-1.967)
Education (Reference : No education)				
Primary school	0.516*(0.414-0.644)	0.765*(0.586-1.000)	0.717*(0.591-0.869)	0.664*(0.526-0.838)
High school	0.476*(0.362-0.625)	0.672*(0.539-0.836)	0.529*(0.413-0.678)	0.575*(0.430-0.770)
Vocational certificate	0.349*(0.266-0.457)	0.598*(0.461-0.777)	0.414*(0.327-0.524)	0.362*(0.276-0.476)
University or over	0.293*(0.214-0.402)	0.574*(0.427-0.770)	0.329*(0.253-0.428)	0.335*(0.249-0.451)
Occupation (Reference : Unemployed)				
Student	0.491(0.229-1.052)	1.184(0.883-1.416)	1.117(0.821-1.434)	1.135(0.903-1.454)
Farming	1.948*(1.557-2.439)	2.016*(1.607-2.529)	1.133(0.820-1.367)	0.958(0.796-1.151)
Business owners	1.014(0.795-1.292)	1.202(0.802-1.489)	1.500*(0.853-1.775)	0.868(0.716-1.052)
Government officer	1.132(0.850-1.507)	1.156(0.868-1.589)	1.659*(0.823-1.830)	0.805(0.632-1.027)
Private officer	1.145(1.071-1.529)	1.106(0.817-1.437)	1.300*(0.869-1.658)	1.156(0.946-1.543)
Wage laborer	2.223*(1.759-2.809)	2.298*(1.824-2.896)	1.180(0.987-1.411)	1.431*(1.174-1.745)
Other	0.835(0.585-1.191)	1.091(0.775-1.536)	1.010(0.777-1.312)	0.879(0.663-1.165)
Region (Reference : Central)				
Eastern	1.127(0.925-1.375)	1.040(0.858-1.260)	2.638*(2.234-3.116)	2.267*(1.863-2.757)
Northeastern	1.115(1.074-1.361)	1.319*(1.094-1.590)	1.119(0.858-1.756)	2.691*(1.988-3.612)
Western	1.501*(1.257-1.900)	0.985(0.824-1.178)	3.497*(2.939-4.162)	2.654*(2.171-3.245)
Northern	1.008(0.932-1.295)	2.010*(1.632-2.475)	1.106(0.948-1.348)	1.643*(1.332-2.025)
Southern	1.922*(1.592-2.320)	0.995(0.875-1.839)	1.030(0.883-1.202)	0.965(0.814-1.144)
_cons	19.432	15.587	18.652	28.665
Pseudo R2	0.207	0.170	0.195	0.123
Prob>Chi2	0.000	0.000	0.000	0.000

* Significant at the .05 level

[1] Multivariate logistic regression, adjusted for the other factors shown in Table

Marital status: formerly married people tend to have higher proportion of smoking, drinking and non-exercise than single and married people. Moreover, it was found that more than half of ever-married people did not exercise.

Education: The findings showed that respondents who graduated primary education only had the highest proportion of smoking, drinking alcohol and non-exercise.

Occupation: Famers were reported to have the highest proportion of smoking and drinking and the respondents who worked as the wage-laborers had the second rank proportion. In addition, government officer presented the greatest proportion of no exercise (58.3%) followed by private officer worker (55.1%).

Region: Respondents who lived in southern region were the highest proportion of smoking, while northern respondents tend to consumed alcohol higher than other regions. Concerning the exercise practice, the central population had the highest proportion on regular exercise.

Factor related to health-risk behaviors

This paper used the logistic regression model to investigate the research hypothesis that the likelihood of respondent's health risk behaviors (smoking, alcohol consumption and no exercise) was related to gender, age, education, occupation, marital status and region. The results showed that all health risk behavior models had the probability of chi-square less than 0.01. It means that these models were suitable to predict the health risk behaviors. The adjusted odds ratio of the model presented in Table 2.

Factors related to smoking

According to logistic regression model (Table 2), we found females were less likely to smoke than males, with adjusted odds ratio 0.083. The higher age of respondents, the lower probability of smoking they had. Moreover, this study found ever married people were more likely to smoke 1.680 times than others. Respondents who had higher education

attainment had the lower probability of smoking behavior. People who had primary school only had the highest adjusted odds ratio followed by high school, vocational certificate and university or over level.

Furthermore, this study articulated that farmer, wage labor, and lived in southern region were positively related to smoking ($p<0.05$). The adjusted odds ratios of farmer, wage labor and southern people were 1.948, 2.223 and 1.922, respectively. It implied that people in the category of farmer, wage labor, and live in southern region were more likely to have higher smoking behavior than people who work in other occupation and other regions.

Factors related to alcohol consumption

Alcohol consumption was negatively significant related to female ($p<0.05$) and age of respondents ($p<0.05$). It means male and younger respondent tend to drink alcohol more than female and older respondents. Ever married people had 1.362 times to drink alcohol than single people, while wage labor and farmer were 2.298 and 2.016 times in alcohol consumption than unemployment. Moreover, People who graduated primary school only and lived in northern region had the highest probability in alcohol consumption.

Factor related to non-exercise

When considering non-exercise behavior (Table 2), male had higher adjusted odds ratio of non-exercise than female ($p<.05$) while higher education tend to exercise more than lower education. Government officer and Business owners were more likely 1.659 times and 1.500 times to non-exercise larger than unemployment. Moreover, ever married people had 1.442 times to non-exercise greater than single people. Western and Eastern people had the highest probability to non-exercise.

Factor related to smoking, alcohol consumption and no-exercise

If we look at the respondent those who smoking, drink alcohol and non-exercise practice (the last column of Table 2) showed that males tend to have higher probability of three health risk behaviors than females with adjusted odds ratio 0.295. The higher education presented the lower probability of smoking, alcohol consumption and non-exercise practice. Wage labor (adjusted odds ratio=1.431) and ever married people (adjusted odds ratio=1.611) had significantly influence to three health risk behaviors.

DISCUSSION

An increased risk of health-risk behaviors, including drinking alcohol, smoking and non-exercise led to various health problems. Results from this survey demonstrated that male had higher three health risk behavior than female. Underlying the selection bias which affected to gender proportion, thus it should be reconsidered to conclude the result that related to gender. Moreover, ever married people had greater adjusted odds ratio of smoking, alcohol consumption and non-exercise than others. Farmer, wage labor and younger respondents had the higher probability of smoking and drinking alcohol than other while government officer reported the highest no exercise practice. People who live in southern region had the greatest probability to smoking. Regarding to alcohol consumption, it found northern people had the highest probability to alcohol consumption. Moreover, the higher education people represented the lower adjusted odds ratio within three types of health-risk behaviors.

The results were similar to recent health risk identification surveys in the Thai Health Promotion Foundation in 2011. It was found that the proportion of male drinkers is higher than female 5 times and tends to smoke than female 20 times [18]. This tread was similar with Asian societies that the smoking rate in males was much higher than in females [19, 20] . Some reasons why males were more likely to smoking and drinking than female because women were generally more concerned about health issues [14] and males tend to work hard, experience more stress from their job and work in the more hazardous environment than females, and this led to increase smoking or drinking as a form of self-medication, as it was articulated Metcalfe and colleagues found that the level of stress related to smoking and drinking was positive. The higher the level of stress, the more drinking and smoking there was [21].

Thai government already enacted Alcoholic Beverage Control Act since 2008; namely minimum age of purchasing alcohol $\geq$ 20 years [22], and tobacco control by increasing tobacco tax continuously over year and prohibited to smoking in indoor public places [23, 24]. However, the results from this study showed 17.5% of underage 20 years still drinking and smoking. Similar result with the smoking and drinking behavior survey 2014 of National Statistical Office found that the number of Thai people aged 15-24 year old commonly consume alcohol (16.7%) and smoking (15.6%) [7].

Farmer and wage labor presented the highest adjusted odds ratios comparing to other occupations. According to Wilkinson R, Marmot M. stated that people who worked in lower levels of occupations were likely to have less education and were more likely to have disadvantage behaviors in order to

cover up their problems from their workplace and family [25]. In addition, ever married people had the highest adjusted odds ratio of three health risk behaviors, the relationship between marital status and health behavior is a function of how social support could absorb stress and maintain positive health behaviors. Married people were more likely to have a good diet and healthy lifestyles, while ever married (widowed or divorced) reported unfavorable nutrition and mental health condition such as stress and depressive disorder [26, 27]. Similar to other studies, the higher education represented the lower adjusted odds ratio towards three types of health risk behaviors. Low educated persons with occupation do not offer better knowledge of health-risk behavior tend to less motivation to adopt healthy behavior [28-30].

These finding demonstrated that government policy should address among young generation. The way to reduce the health risk behavior should not only be to control age of use, tax and price, but also should address the health promotion program that suitable with their characteristic, such as gender, age, education and occupation. According to the study of Marmot and colleagues [31] found that heath intervention approaches was effective for young generation. Their finding strongly suggested developing a health promotion in order to reduce the health-risk behavior; it had to taking into account the demographic characteristics, such as gender and age [32]. In addition, government policy also should particularly address health intervention for low education. As finding from Chaloupka [33] stated that the less educated was less likely to try to quit, thus the effort of smoking cessation should be strongly encouraged and made it more convenient for those with less education. Private sector should also involve to health promotion campaign. They can make particular requirement for workforce, such as no smoking staff or restricted smoking area. Supporting study articulated that if company required healthy workforce, thus most of the workers that had perceived health status at good levels [34]. The mass media also had potential important role on smoking cessation campaign such as anti-tobacco campaigns, the non-smokers rights movement and fund media campaigns [34].

Regarding exercise, government policy in the future needs to promote exercise adherence in a more rigorous way by using mass media because lower education people are more likely exposed by mass media. As reported by Dukin [35], mass media campaigns were found to be most effective to improve knowledge, attitude, and quitting behavior, especially, lower socioeconomic smokers. Moreover, government should provide sport campaigns with suitable in each region including exercise facility, public fitness or exercise center.

LIMITATION OF THE STUDY

We identified some limitations of the current study and made suggestions for future research. First, regarding to the complexity of behavior, although most of the health-related behaviors examined here are listed as the major health-affecting behaviors, it may have not taken into account several behaviors. For example, physical fights, risky sexual behavior, poor eating behavior, reckless driving, sedentary lifestyle and other behaviors were not counted. Second, there are sampling method and data collection restrictions such as respondent selection and sampling area distribution which may affect the reliability in generalizing findings.

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