



Correlation between Perceived Severity of COVID-19 and Self-Protective Behavior during COVID-19 Pandemic in Chiang Rai Smokers

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ABSTRACT

Introduction: The COVID-19 disease affects among economy, society, and health in population. Smoking could increase chance of contracting COVID-19 and increase the severity level of COVID-19 symptom. No study about the impact of COVID-19, perceived severity of COVID-19 and smoking behavior in smoking population during COVID-19 pandemic in Chiang Rai.

Objective: There are three aims of this study which are to study smoking behavior, to study impact of the Covid-19 pandemic situation in Chiang Rai smokers and to study the correlation between perceived severity of COVID-19 and self-protection behavior during the COVID-19 pandemic in Chiang Rai smokers.

Methods: The smokers have smoke at least 3 years, aged 18-60 years old and stayed in Chiang Rai were recruited in this study. A self-administered anonymous questionnaire was used to collect information via google form program. The questionnaires comprising 5 parts consisted of sociodemographic data, smoking behavior, impact of smoker on the covid-19 situation, perceived severity of covid-19 and protective behavior from covid-19.

Results: 215 smokes were recruited in this study. The most participants are 200 (93.0%) males, mean aged 33.03 (± 12.38) years old. Mean duration of smoking is 15.11 (± 11.98). Smoking behavior, they usually buy cigarettes from retail stores, 1 time a week, each time bought a pack of cigarettes, an average cost of 61-80 bath a time and average monthly cost of 101-500 baht. COVID-19 impact to income and expense of smokers. The protection yourself by wearing a mask, wash your hands with soap or alcohol gel and keeping distance in Chiang Rai did not affect the smoking behavior and the purchase of cigarettes among the smoking population in Chiang Rai. The correlation between perceived severity of COVID-19 and self-protective behavior from COVID-19 is 0.166 (p-value = 0.015).

Conclusion: There is not impact of the COVID-19 pandemic on smoking and the vigilant measures against the spread of covid-19 excepted economy. Poor correlation between perceived severity of COVID-19 and self-protective behavior from COVID-19.

Keywords: correlation; Covid-19; perceived severity; protective behavior; Smoking

Introduction

Cigarettes are one of the biggest public health threats in the world by killing more than 8 million people per year [1]. 72,656 Thais died from smoking [2]. In Chiang Rai, it was found that there is a population aged 15 years and over, smoking 57,045 people from the population that has been registered 664,767 people [3].

Smoking is also responsible for the most common causes of death, including cardiovascular disease, emphysema and lung cancer, respectively [4]. Each smoker has a different risk of developing diseases based

on genetics, length of time smoked, amount smoked, and smoking habits and other risk factors.

Cigarette consumption behavior throughout Thailand in 2017 found that there were 10.7 million people aged 15 years and over, with the average age of first smoking being 18.1 years old [5]. Most cigarettes smoke a larger proportion of packs than cigarettes and the average monthly cost of buying cigarettes is 546 baht [5].

In the epidemic situation of the corona virus Globally, there are more than 239 million infected people and more than 4.8 million cumulative deaths

from Covid-19, 1.7 million in Thailand and 18205 respectively [3]. The economic, social, health and public health impacts of dealing with emerging diseases in urban lockdown. Chiang Rai Province was affected in two main areas, comprising effects on border trade and tourism [6]. As a result, the income of the population in Chiang Rai decreased [7].

Smoking increases the chances of contracting COVID-19 because while smoking increases the respiratory rate. This results in a change in nasal breathing to mouth breathing. The mucus becomes dry and sticky. Cilia's movements slowed down. As a result, the filtration efficiency of the respiratory system is reduced [8]. The more smoking that involves repeatedly touching the face with your hands, the easier it is for the virus to enter the body.

From previous studies on smoking in COVID-19 patients, it was concluded that both current and former smokers smoked cigarettes [9]. Smokers with infected COVID-19, there could be a higher percentage of the severity rating. The patient could have a chance to use a ventilator and was admitted to the ICU [10].

No previous research study about the smoking behavior, impact of the Covid-19 pandemic situation and correlation between perceived severity of COVID-19 and self-protection behavior during the COVID-19 pandemic in Chiang Rai smokers

The aims of this study are to study smoking behavior, to study impact of the Covid-19 pandemic situation in Chiang Rai smokers and to study the correlation between perceived severity of COVID-19 and self-protection behavior during the COVID-19 pandemic in Chiang Rai smokers.

Methodology

Study Design and Participants

This cross-sectional study was conducted in smoking population, Chiang Rai province. The search was restricted to studies between November 2021 to February 2022. Eligibility criteria were: 1) live in Chiang Rai; 2) aged 18 to 60 years old; 3) a current smoker; 4) smoking at least 3 years. The people who were unable to read Thai were excluded in this study. The study protocol was approved by the Human Ethics Committee of the Mae Fah Luang university (Protocol No: EC 21184-25). All participants signed consent form before they did the online questionnaire. Only the researchers could access the data for data prevention. The snowball sampling technique was used to recruit participation.

Data Collection and Questionnaire Development

A self-administered anonymous questionnaire was used to collect information from 215 people via google form program. The questionnaire was created according to the objective, key word of the study and the literature review. The content validity of the questionnaire was

examined by 3 experts consisting of tobacco, covid-19, and cardiopulmonary experts that found the content consistency index (IOC) = 0.67. Then the questionnaire was tested by a current smoker in Chiang Rai for the use of appropriate language, Test-retest reliability is 0.969, p-value < 0.001. The questionnaires comprised 5 parts sociodemographic data 13 items, smoking behavior 10 items, impact of smoker on the covid-19 situation 9 items, perceived severity of covid-19 10 items and protective behavior from covid-19 10 items. Totally of the questionnaire are 52 questions.

Perceived Severity of COVID-19. Totally questions are 10. (Known = 1 point, Unknown = 0 point). Therefore, fully score are 10 points.

Behaviors to protect yourself from COVID-19 infection in smokers are totally 10 questions. Each question is 2 points. (0 = Not implemented at all, 1 = Practice sometimes, 2 = Regular practice). Totally full score are 20 points.

Statistical Analysis

SPSS version 23 was used to statistically analyze the data. Descriptive statistics for continuous variables as means $\pm$ standard deviation, while categorical data were reported by frequency and percentage. The Kolmogorov Smirnov test was used to test normal distribution. The test-retest reliability and correlation between perceived severity of COVID-19 and self-protective behavior from COVID-19 was statistically analyzed by Spearman rank correlation coefficient. It was classified by Chan YH, 2003 (1 Perfect correlation, 0.8-0.9 Very Strong correlation, 0.6-0.7 Moderate correlation, 0.3-0.5 Fair correlation, 0.1-0.2 Poor correlation and 0 No correlation) [11].

Results

215 smokers were recruited in this study. They were able to complete the questionnaire within 15-20 minutes. The most participants are 200 (93.0%) males, mean aged 33.03 (± 12.38) years old, mean weight 70.28 (± 15.88) kg. and mean height 169.90 (± 6.76) cm. Most participants are single, their level of education is senior high school and no underlying disease. Most occupations are general employees, their monthly expenditure was between 10,001 and 15,000 THB. The mean age to start smoking is 17.38 (± 3.49), the mean duration of smoking is 15.11 (± 11.98). Most of which are the reason for choosing to smoke because they want to try and have a history of having completed 2 vaccinations. Demographic data of all participants was shown in table 1.

Table 1 Demographic data (n=215)

Demographic data	Number (%)
Gender	
Male	200 (93.0)
Female	15 (7.0)
Age (years), mean (±SD)	33.03 (±12.38)
Weight (kilograms), mean (±SD)	70.28 (±15.88)
Height (centimeters), mean (±SD)	169.90 (±6.76)
BMI (kg/m ²), mean (±SD)	24.28 (±4.92)
Status	
Single	147 (68.4)
Married	62 (28.8)
Widowed/Divorced	6 (2.8)
High level of education	
Elementary school	28 (13.0)
Secondary school/Diploma	105 (48.8)
Bachelor's degree	78 (36.3)
Postgraduate	4 (1.9)
Underlying disease	
Yes	52 (24.2)
No	163 (75.8)
Occupation	
Student	62 (28.8)
Self-employed/ Trading	18 (8.4)
Government official	26 (12.1)
Private company employees	12 (5.6)
Agriculturist	9 (4.2)
General Contractor/Temporary Worker	81 (37.7)
No occupation	7 (3.3)
Monthly income (baht)	
No income	15 (7.0)
Less than 5,000	23 (10.7)
5000-10,000	56 (26.0)
10,001-15,000	74 (34.4)
15,001-20,000	22 (10.2)
More than 20,000	25 (11.6)
The age of start smoking (year), mean(±SD)	17.38 (±3.49)
The duration of smoking (year), mean(±SD)	15.11 (±11.98)
The reason for starting to smoke	
For relaxing	50 (23.3)
Want to try	141 (65.6)
For looking stylish and cool	19 (8.8)
For socializing	94 (43.7)
Have stress/anxiety	92 (43.3)
To show maturity	6 (2.8)
To make more confident	15 (7.0)
According to their favorite celebrity or person as a family member	3 (1.4)
8 (3.7)	
Vaccinated against COVID-19	
Not get vaccinated	10 (4.7)
1 dose	29 (13.5)
2 doses	141 (65.6)
3 doses	35 (16.3)

time bought a pack of cigarettes, an average cost of 61-80 baht a time and average monthly cost of 101-500 baht, respectively. Purchasing behaviors during COVID-19 (n=215) is shown in table 3.

Table 2 Smoking behavior (n=215)

Smoking behavior	Number (%)
Type of cigarettes	
LM	115 (53.5)
Self-rolled cigarettes (powder cigarettes/tobacco rolls)	56 (26.0)
Marlboro	56 (26.0)
Krong Thip	27 (12.6)
Sai-fon	9 (4.2)
Garam	12 (5.6)
Cigar	9 (4.2)
Pipe	6 (2.8)
Electronic cigarette	82 (38.1)
Other (iSCORE, Mond, Wonder, Atlanta, SMS, Camel)	22 (10.2)
The number of cigarettes per day (Roll)	
10 or less than 10	127 (59.1)
11-20 rolls	48 (22.3)
21-30 rolls	4 (1.9)
More than 31 rolls	2 (0.9)
No (in case of smoking only e-cigarettes)	34 (15.8)
The most smoking time	
After waking up	22 (10.2)
After eating	84 (39.1)
After exercise	4 (1.9)
Free time	88 (40.9)
While going to the bathroom	11 (5.1)
Before going to bed	6 (2.8)
The most frequency smoking place	
Bathroom	
School	32 (14.9)
Residence/House/Condo	2 (0.9)
Public places (e.g. parks, shopping centers, street corners, stadiums)	49 (22.8)
At social events/entertainment venues	3 (1.4)
Smoke when there is a smoking place	26 (12.1)
No place to choose, depending on the occasion.	46 (21.4)
51 (23.7)	
Other, specify	6 (2.8)
The most person who smoking with is	
Single smoker	160 (74.4)
Smoking with 1 other person	26 (21.1)
Smoking with more than 1 person	29 (13.5)

Smoking behavior is shown in table 2. This study showed LM was the most type of cigarette. The number of cigarettes smoked per day is about 10 or less than 10. Most smokers are smoking alone. They usually buy cigarettes from retail stores, 1 time a week, each

Table 3 Purchasing behaviors during COVID-19 (n=215)

Purchasing behaviors	Number (%)
In 30 days where did you buy cigarettes?	
Retailers/Stalls	147 (68.4)
Let others buy instead	23 (10.7)
Department stores/ Supermarkets	73 (34.0)
Website	26 (12.1)
Restaurant	10 (4.7)
The most frequency of buying cigarettes	
1 time/week	92 (42.8)
2 time/weeks	40 (18.6)
More than 2 time/weeks	83 (38.6)
Average cost of each cigarette purchase	
Not more than 40 baht/time	38 (17.7)
41-60 baht/time	25 (11.6)
61-80 baht/time	96 (44.7)
More than 80 baht/time	56 (26.0)
The cost of buy cigarette per month	
Less than 100 baht	25 (11.6)
101-500 baht	98 (45.6)
501-1,500 baht	64 (29.8)
1,500-2,500 baht	19 (8.8)
More than 2,501 baht	9 (4.2)

Impact of the COVID-19 pandemic on smoking and the vigilant measures against the spread of covid-19 don't affect to smoking in Chiang Rai smokers as shown in Table 4.

The score of Perceived Severity of COVID-19 is Median = 9. Interquartile range (IQR) = 7, 25th percentile (Q1) = 3, 75th percentile (Q3) = 10. There is lowest score is 0 and highest score is 10 as shown in table 5.

The results of behaviors to protect themselves from infection with COVID-19 showed mean of behaviors to protect yourself from COVID-19 infection in smokers is 15.1 ($\pm$ 3.3), lowest score is 3 and highest score is 20, respectively as shown in table 6.

Table 4 Impact of the COVID-19 pandemic on smoking (n=215)

Impacts from the Covid-19	Number (%)
Have you ever been infected with COVID-19?	
Never	209 (97.2)
Ever	6 (2.8)
Have you ever been quarantined for 14 days because of the risk of contracting COVID-19?	
Never	164 (76.3)
Ever	51 (23.7)
The spread of COVID-19. How does it affect your income?	
Unchanged	60 (27.9)
Decrease	21 (9.8)
Increase	134 (62.3)
The spread of COVID-19. How does it affect your expenses?	
Unchanged	64 (29.8)
Decrease	71 (33.0)
Increase	59 (27.4)
No income	21 (9.8)
The spread of COVID-19. How does it affect your purchase of cigarettes?	
Does not affect the purchase of cigarettes	187 (87.0)
Easier to buy	3 (1.4)
Harder to buy	25 (11.6)
Measures to prevent infection with COVID-19 with a mask How does it affect your smoking?	
Smoking the same/No effect on smoking	159 (74.0)
Smoke less	50 (23.3)
Smoke more	6 (2.8)
Measures to prevent infection with COVID-19 with social distancing How does it affect your smoking?	
Smoking the same/No effect on smoking	163 (75.8)
Smoke less	47 (21.9)
Smoke more	5 (2.3)
Measures to prevent infection with COVID-19 by washing hands How does it affect your smoking?	
Smoking the same/No effect on smoking	183 (80.5)
Smoke less	36 (16.7)
Smoke more	6 (2.8)

Table 5 Perceived Severity of COVID-19 (n=215)

Perceived Severity of COVID-19	Known (%)	Unknown (%)
1 Did you know that COVID-19 worsen lung performance	188 (87.4)	27 (12.6)
2. Did you know that COVID-19 worsen lung performance as well as smoking	171 (79.5)	44 (20.5)
3. Did you know that Covid-19 patients with a history of smoking have more severe symptoms than non-smokers	145 (67.4)	70 (32.6)
4. Did you know that Smokers are at risk of contracting COVID-19 higher than non-smokers	125 (58.1)	90 (41.9)
5. Did you know that Covid-19 patients with a long history of smoking had more severe symptoms than those who started smoking	127 (59.1)	88 (40.9)
6. Did you know that Covid-19 patients with a history of heavy smoking had more severe symptoms than those who smoked low amounts	140 (65.1)	75 (34.9)
7. Do you know that COVID patients who have a history of smoking and have congenital disease? More severe symptoms than smokers without underlying medical conditions	144 (67.0)	71 (33.0)
8. Did you know that Covid-19 patients with a history of smoking had a higher mortality rate than those without a history of smoking	134 (62.3)	81 (37.7)
9. Did you know that secondhand smoke and the third hand affects the people around you, if infected with COVID-19 may make symptoms more severe	150 (69.8)	65 (30.2)
10. Did you know that Smoking and nicotine from cigarettes are among the strongest risk factors in infection with the COVID-19	121 (56.3)	94 (43.7)

Table 6 Behaviors to protect yourself from COVID-19 infection in smokers (n=215)

Behaviors to protect yourself from COVID-19	Regular	Sometimes	Not implemented at all
1. How often do you wear a mask every time you leave the house?	201 (93.5)	11 (5.1)	3 (1.4)
2. How often do you order food to come home to eat?	72 (33.5)	117 (54.4)	26 (12.2)
3. How often do you wash your hands with soap/alcohol gel when you come in contact with things and places outside the home?	151 (70.2)	63 (29.3)	1 (0.5)
4. How often do you keep a distance of 1-2 meters when you need to meet and talk to other people?	119 (55.3)	91 (42.3)	5 (2.3)
5. How often do you avoid doing activities in crowded places?	104 (48.4)	102 (47.4)	9 (4.2)
6. How often do you refrain from leaving the house to reduce the transmission of the virus?	80 (37.2)	121 (56.3)	4 (6.5)
7. How often do you not share things with other people?	125 (58.1)	75 (34.9)	15 (7.0)
8. How often do you not travel in and out of risky areas according to the provincial governor's announcement?	124 (57.7)	75 (34.9)	16 (7.4)
9. When you have a fever, cough, sore throat, see a doctor immediately.	92 (42.8)	98 (45.6)	25 (11.6)
10. You follow the news of the COVID-19 situation via television/internet/radio	155 (72.1)	55 (25.6)	5 (2.3)

Poor correlation between perceived severity of COVID-19 and self-protective behavior from COVID-19 is 0.166 (p-value = 0.015).

Discussion

Three aims of this study were to study smoking behavior, to study impact of the Covid-19 pandemic situation in Chiang Rai smokers and to study the correlation between perceived severity of COVID-19 and self-protection behavior during the COVID-19 pandemic in Chiang Rai smokers.

4.1 Smoking behavior

In the situation of the pandemic of COVID-19 Most of the reasons for smoking is wanting to try, followed by socializing. Follow up with friends, friends invite you to smoke, and have stress or anxiety. Make the most of your free time smoking. Without choosing a place depending on the occasion Most of them smoke alone. The number of cigarettes smoked per day was mostly about 10 roll or less and cigarettes were purchased from retail stores or stalls. Age at the start of smoking it was in the mean age range of 17 years, consistent with previous studies. As similar as the smoking behavior of 384 people in Surat Thani province [12], it was found that the average age of smoking for the first time of regular smokers was 17.8 years the reason why started smoking. Desire to try smoking accounted for 36.46%, and the number of cigarettes smoked less than 10 cigarettes per day, representing 45.10% [12], probably because the volunteers in studies had a similar average age at first smoking. Therefore, the group of volunteers has a concept or the same reason for starting to smoke.

4.2 Impact of the pandemic of COVID-19 in smokers

It was found that most result is a decrease income and more expenses. This is consistent with the previous studies Chakkrit et al, 2021 [13]. It was found that the most common impacts on people from the COVID-19 epidemic were income reductions and unemployment or out of business and the study of Supattra Runratt et al, 2020 [14] found that household incomes with all types of vulnerable groups (Except for the elderly) decreased during the coronavirus more than households without vulnerable groups while expenditure increased in proportion to the large decrease in income. This study collected the data after lockdown period, purchasing behavior and smoking behavior of the smoking population in Chiang Rai were stable. This is inconsistent with the previous studies, the study by Julia C. Chen-Sankey [15]. The smoking is more and has a tendency to quit smoking due to the epidemic situation of COVID-19 causing stress and anxiety [15]. They found that the population of tobacco use is increasing during the COVID-19 epidemic and during the lockdown period when they had increased stress and anxiety, feel alone and from long periods of quarantine, it has turned to using cigarettes to relieve stress [15-16].

4.3 Correlation between perception of severity of COVID-19 and self-protection behaviors from COVID-19

Poor correlation between perception of severity of COVID-19 and self-protection behaviors from COVID-19 of smokers was found in this study. The perception of severity of COVID-19 and self-protection behavior are not related. Though the data collection period, there is an announcement from the

Ministry of Public Health of the guidelines for preventing the spread of COVID-19 [17] through television and the internet and various channels. The smokers are not completely preventing COVID-19 following the guidelines.

There was an abnormal distribution indicating that the Chiang Rai smoking population had a high perception of the severity of COVID-19 (Median = 9/10 points). The distribution of self-defense behaviors data is normal. (Mean=15.1/20 points) shows that the smoking population in Chiang Rai province had variety of self-defense behaviors. It might be behaviors are based on knowledge and attitudes that drive behavior in which everyone [18].

Conclusion

COVID-19 impact to income and expense of smokers. The protection yourself by wearing a mask, wash your hands with soap or alcohol gel and keeping distance in Chiang Rai did not affect the smoking behavior and the purchase of cigarettes among the smoking population in Chiang Rai. The correlation between perceived severity of COVID-19 and self-protection behaviors during the COVID-19 epidemic in the smoking population Chiang Rai province found that there was poor. The population who smokes in Chiang Rai have variety of self-defense behaviors.

Limitation of this study

This study collected the data during Chiang Rai Province had number of COVID-19 patient less than previous, no country lockdown. Therefore, future studies it is recommended to study in other areas or study during other times when there is a different spread of COVID-19.

Recommendations for the future study

Covid- 19 pandemic in Thailand is getting better after a lot of people got COVID-19. Further study could study the effect of post COVID-19 in smokers who got COVID-19 whether impact on their perceived severity, economy, smoking behavior, or health.

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