Original Article

The Study of Prevalence and Factors Related to Smoking of Thai Families during the COVID-19 Pandemic

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Background: COVID-19 is a viral respiratory infection causing severe acute respiratory syndrome. Smoking is a major cause of non-communicable diseases and causing death of Thai people in the past 10 years. COVID-19 patients with a history of smoking could experience severe symptoms.

Objective: To study the prevalence and related factors of smoking in Thai families during the COVID-19 pandemic.

Materials and Methods: The present study was a survey to explore the prevalence and factors of smoking in Thai families.

Results: During the COVID-19 pandemic, 41.5% of Thai family had a family member that smoked. The factors affecting smoking in the family were the extended family, which was statistically significantly more than in the single family at 1.53 times (adjusted OR 1.53, 95% CI 1.21 to 1.94). Monthly family income, insufficient income, or no income affected smoking in the family statistically significantly more than expenditures at 2.41 times (adjusted OR 2.41, 95% CI 1.38 to 4.22). Monthly family income that changed to insufficient income for some months affected smoking in the family statistically significantly more than expenditures at 2.29 times (adjusted OR 2.29, 95% CI 1.31 to 3.98). Monthly moderate family income with just enough each month affected smoking in the family statistically significantly 2.02 times higher than in families with higher income (adjusted OR 2.02, 95% CI 1.15 to 3.55). At least one type of the domestic violence such as mental, physical, or sexual violence in the family affected smoking in the family during the COVID-19 pandemic more than in the non-violent families 1.31 times (adjusted OR 1.31, 95% CI 1.04 to 1.65).

Conclusion: The present study showed the prevalence of smoking in Thai families during the COVID-19 pandemic has relationship with family characteristics, domestic violence, and monthly income.

Keywords: COVID-19; Smoking; Family

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Coronavirus Disease 2019 is an emerging disease. It is a respiratory infection that caused severe acute respiratory syndrome coronavirus 2 (SAR-CoV-2) first reported in Wuhan, China in the late 2019. The outbreak of the coronavirus disease 2019 has a global impact on health, economy, society, and public health. Information on the pandemic situation on November 4, 2021, showed that there were 97,235 new cases with 248,930,290 cumulative cases, and 2,818 new deaths with 5,039,514 cumulative deaths worldwide[1]. On that day, Thailand had 7,982 new cases with 1,943,424 cumulative cases, and 68 new deaths with 19,462 cumulative deaths[2]. Thailand started to find new cases of COVID-19 in January 2020. The first wave of the pandemic outbreak was between March and May 2020. Then, the second wave was between December 2020 and March 2021, with the pandemic spreading widely starting in April 2021 to the present, which is November 2021.

Smoking is a major cause of non-communicable diseases (NCDs) and health problem in the world. The World Health Organization (WHO) estimates about three million people worldwide would die each year from cardiovascular disease from tobacco consumption, and another 890,000 from the exposure to secondhand smoke. This is consistent with the situation in Thailand, with 314,340 deaths, or 73.0%, in 2009. The main disease groups are cardiovascular disease, cancer, diabetes, and chronic obstructive pulmonary disease. The most common health risk factor is smoking.

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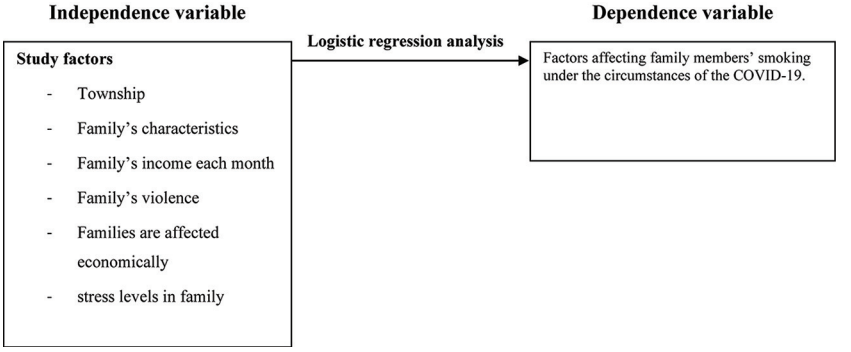

Figure 1. Conceptual framework.

The smoking situation in Thailand between 2007 and 2017 showed that the mortality rate from smoking tended to increase. In 2017, there were 72,656 deaths with history of smoking. Cigarettes remain the number one cause of death in the past 10 years[3]. Smoking and vaping e-cigarettes affect the respiratory system and directly destroy the lungs tissue. Furthermore, it increases the risk of contracting COVID-19 from the gesture of smoking by holding the cigarette with the finger near the nose. It was also found that patients infected with COVID-19 with history of smoking or vaping e-cigarettes have poor lung health, which could lead to severe symptoms and death[4]. From the survey of domestic violence problems in Thailand throughout the country in 2017, the Center for Research and Knowledge Management for Tobacco Consumption Control, Faculty of Medicine Ramathibodi Hospital found that 49% of the families surveyed had a family member who smoked[5].

Therefore, the researchers were interested in studying the prevalence of smoking in the family and factors related to smoking in Thai families during COVID-19 pandemic.

Objective

1. To study the smoking behavior in Thai families during COVID-19 pandemic.
2. To study factors related to smoking in Thai families during COVID-19 pandemic.

Materials and Methods

The present study was a survey research that aimed to find the prevalence of smoking among Thai families and factors related to smoking in Thai families during COVID-19 pandemic. The study was approved by the Human Research Ethics Committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University (COA. MURA2020/1113).

Population and sample

The Thai Family Health Survey to determine the prevalence of families who smoke during the COVID-19 pandemic was a population-based cross-sectional survey in Thai people. Using face-to-face interview methods in the random households.

Population characteristics and samples

Population: The population in the present survey referred to the population of Thai women over 15 years of age living in Thailand, amounting to 26,713,936 households (houses), as of the data from the Registration Office in December 2019, Department of Provincial Administration, Ministry of Interior[6].

Sample: The sample was defined as a woman over 15 years of age who lived in the house and represented the family, one person per household, excluding those living in institutions such as temples, dormitories, schools, hospitals, nursing homes, and military camps.

Sample size calculation: Calculating sample size formulas for a family health survey in the COVID-19 pandemic, parameter estimation was used to estimate the proportion or prevail in a finite population. The researcher used the sample size formula to estimate the proportion[7].

There were 26,713,936 households (December 2019) in Thailand. The prevalence of smoking in the family in Thailand was 48.9%[8]. By determining d as a constant (absolute error) to be equal to 0.05, 95% confidence interval (CI), equal to 0.489±0.05 or the researcher had 95% confidence that the prevalence of domestic violence in Thailand would be between 0.439 and 0.539, so n was 384 and the design effect (deff) was 3.04. Adjusted for n (n_{Adjust}) was 1,168.

In estimating the proportion of compensation for the sample who did not complete the questionnaire at

10%, the total number of samples required to collect were 1,285 people or family representatives.

Sample design

This sample survey requires a multi-stage sampling, which is a probability proportional to size sampling, that divides the population area in cluster sampling. There are Bangkok and four other regions, totaling five areas.

Data analysis

Categorical variables were described using frequencies and percentages while continuous variables were described using mean with standard deviation and min-max.

Chi-square statistic test was used to find the categories of the independent variables that are specifically significant in relation to family members' smoking.

A logistic regression analysis was done when the independent variable was related to the family members' smoking using a univariate model to produce unadjusted model or crude odds ratio (OR) (95% CI) and a multivariable model was used to produce adjusted model with adjusted OR (95% CI). Selection method is probability for backward stepwise, entry=0.05 and removal=0.05.

Statistical analyses were performed using Stata Statistical Software, version 16.1 (StataCorp LLC, College Station, TX, USA) with statistical significance stated at p-value less than 0.05.

Results

Part 1: Sample population data

By calculating the sample to represent the population, included compensation, the sample was able to collect data on 1,285 households, of which all 1,285 households were willing to participate in the program. The results were analyzed for 1,285 households, representing a response rate of 100%.

General characteristics of the interviewee sample: General characteristics of the samples classified by geography, 49.8% living in urban areas and 50.2% outside the city, mean age 53.9 years (SD ±11.69 years) between 15 to 86 years, the majority were marital status 61.6%, widowed/divorced 25.7%, married/married but separated (poor relationship) 1.4%, education level mostly primary school 53.5%, and high school/equivalent (vocational certificate) 16.0%. Most were agriculture/fishery occupations, 27.0%, followed by housewives, 23.3%, as shown in Table 1.

General characteristics of households by region: Most of the family characteristics were single family, 52.4%, followed by extended family, 39.0%. The average number of family members was 4.4 people (SD ±2.0) between 2 and 20 people. The family members smoked 41.5%. Bangkok, the highest family smoking rate was 54.0%; 44.9% of the family members consumed alcoholic beverage; the Northeast had the highest rate of 58.7% of the alcoholic consumption, and 1.4% of the family had other substance abused, as shown in Table 2.

Part 2: General information and household impact before and during the early epidemic, between January and May 2020

Household data before the COVID-19 outbreak: Before the COVID-19 pandemic, no family members were infected, with only two people having been exposed. The average family income was between 10,001 and 20,000 Baht/month for 29.0% of the population, followed by 5,001 to 10.000 Baht/month for 25.6%. Fifty-point-four percent had enough income to live but not enough to save while 23.2% had insufficient income for some months as shown in Table 3.

General information about households during the COVID-19 pandemic, between January and May 2020: The Covid-19 pandemic between January and May 2020, in 33.1% of the households, the family income averaged 5,001 to 10,000 Baht/month, and 32.9% received less than 5,000 Baht/month. Therefore, family income in each month were mostly insufficient income/needy in some months 34.2% of the population followed by 30.6% with insufficient income/no income as shown in Table 4.

The impact of the COVID-19 pandemic: The present study found that the families had a median stress score in the COVID-19 pandemic (percentile of 50) out of a 10-point scale of 5 and a range of 3 to 7. During family stress, 81.7% had no stress-management approach. In terms of economic impact, 37.8% of families were moderately affected, followed by 33.8% highly affected and 6.8% severely affected. Forty percent of the families in Bangkok were highly affected and 15.5% were severely affected as shown in Table 5.

Part 3: Information on the prevalence of violence against women and family members in COVID-19

A survey of 1,285 households found that 542 households had violence against women and family members, with a prevalence of 42.2%. The Northeast

Table 1. General characteristics of interviewees by region

General information	Sample population; n (%)					
	Bangkok (n=200)	Central (n=300)	Northern (n=301)	Northeast (n=264)	Southern (n=220)	Total (n=1,285)
Township						
Urban	100 (50.0)	150 (50.0)	150 (49.8)	130 (49.2)	110 (50.0)	640 (49.8)
Suburb	100 (50.0)	150 (50.0)	151 (50.2)	134 (50.8)	110 (50.0)	645 (50.2)
Age respondents (year)						
Mean±SD	51.0±13.9	57.3±12.9	52.9±9.4	55.4±10.4	51.9±10.3	53.9±11.69
Min-max	19 to 86	15 to 86	20 to 74	23 to 80	20 to 76	15 to 86
Age group (year)						
• 15 to 29	16 (8.0)	13 (4.3)	4 (1.3)	3 (1.1)	9 (4.1)	45 (3.5)
• 30 to 44	47 (23.5)	29 (9.7)	49 (16.3)	34 (12.9)	37 (16.8)	196 (15.3)
• 45 to 59	74 (37.0)	108 (36.0)	186 (61.8)	127 (48.1)	122 (55.5)	617 (48.0)
• 60 to 69	44 (22.0)	106 (35.3)	50 (16.6)	79 (29.9)	42 (19.1)	321 (24.9)
• 70 to 79	15 (7.5)	38 (12.7)	12 (4.0)	20 (7.6)	10 (4.5)	95 (7.4)
• 80+	4 (2.0)	6 (2.0)	0 (0.0)	1 (0.4)	0 (0.0)	11 (0.9)
Marital status						
Single	32 (16.0)	47 (15.7)	15 (5.0)	2 (0.8)	22 (10.0)	118 (9.2)
Married/married together	118 (59.0)	134 (44.7)	200 (66.4)	185 (70.1)	154 (70.0)	791 (61.6)
Separated (work)	6 (3.0)	1 (0.3)	5 (1.7)	11 (4.1)	4 (1.8)	27 (2.1)
Separated (bad relationship)	7 (3.5)	4 (1.3)	5 (1.7)	1 (0.4)	2 (0.9)	19 (1.4)
Widowed/divorced/breakup	37 (18.5)	114 (38.0)	76 (25.2)	65 (24.6)	38 (17.3)	330 (25.7)
Education level						
Under elementary school/not studying	8 (4.0)	35 (11.7)	20 (6.6)	10 (3.8)	9 (4.1)	82 (6.4)
Primary school	102 (51.0)	160 (53.3)	151 (50.2)	162 (61.4)	112 (50.9)	687 (53.5)
Junior high school	65 (17.5)	32 (10.7)	38 (12.6)	28 (10.6)	27 (12.3)	160 (12.5)
High school/vocational certificate	23 (11.5)	37 (12.3)	50 (16.6)	49 (18.6)	46 (20.9)	205 (16.0)
Diploma/high vocational certificate	13 (6.5)	11 (3.7)	14 (5.0)	6 (2.2)	16 (7.3)	61 (4.7)
Bachelor's degree	17 (8.5)	24 (8.0)	25 (8.3)	9 (3.4)	10 (4.5)	85 (6.6)
Master's degree or higher	2 (1.0)	1 (0.3)	2 (0.7)	0 (0.0)	0 (0.0)	5 (0.3)
Occupation						
General employee	35 (17.5)	79 (26.3)	75 (24.9)	57 (21.6)	41 (18.6)	287 (22.3)
Private business/trade	73 (36.5)	59 (19.7)	63 (20.9)	38 (14.4)	30 (13.6)	263 (20.5)
Agriculture/fishery	2 (1.0)	50 (16.7)	82 (27.2)	95 (36.0)	118 (53.7)	347 (27.0)
Government officer/state enterprises	1 (0.5)	4 (1.3)	10 (3.3)	5 (1.9)	3 (1.4)	23 (1.7)
Company employees	8 (4.0)	3 (1.0)	7 (2.4)	0 (0.0)	2 (0.9)	20 (1.6)
Student	0 (0.0)	5 (1.7)	0 (0.0)	0 (0.0)	2 (0.9)	7 (0.5)
Housekeeper	67 (33.5)	87 (29.0)	57 (18.9)	69 (26.1)	19 (8.6)	299 (23.3)
Unemployed	14 (7.0)	13 (4.3)	7 (2.4)	0 (0.0)	5 (2.3)	39 (3.1)

SD=standard deviation

region had the highest rate of family violence at 54.5%, followed by the northern region at 50.2%. The lowest was the central region at 27.7%. The prevalence of violence against women and family members were found to be the highest in psychological violence at 36.3%, followed by sexual violence at 0.5%, and physical abuse at 0.3%, as shown in Table 6.

Part 4: Information on the prevalence of smoking in the family in COVID-19

The present study found that 41.5% had a family member that smoked, and 58.5% were non-smoker family. Bangkok had the highest smoking family, with a prevalence of 54.0%, followed by the southern region at 49.5% and the northeast region at 48.1%, as shown in Table 7.

General factors related to family smoking in COVID-19 pandemic: In the COVID-19 pandemic situation, the factors related to smoking among family members were statistically significant and included the family characteristics, income, economic impact, stress levels, and domestic violence, with the details

Table 2. General characteristics of households by region

General information	Sample population; n (%)					
	Bangkok (n=200)	Central (n=300)	Northern (n=301)	Northeast (n=264)	Southern (n=220)	Total (n=1,285)
Current number of family members						
Median (min-max)	4 (2 to 20)	4 (2 to 15)	3 (2 to 12)	4 (2 to 13)	4 (2 to 10)	4 (2 to 20)
Family characteristics						
Single family	98 (49.0)	128 (42.7)	190 (63.1)	120 (45.5)	138 (62.7)	674 (52.4)
Extended family	88 (44.0)	139 (46.3)	89 (29.6)	115 (43.6)	70 (31.8)	501 (39.0)
Single parenting family	2 (1.0)	14 (4.7)	15 (5.0)	20 (7.5)	8 (3.6)	59 (4.6)
Skipped generation family	12 (6.0)	19 (6.3)	7 (2.3)	9 (3.4)	4 (1.9)	51 (4.0)
Family members are drug abusers						
Smoking	108 (54.0)	95 (31.7)	94 (31.2)	127 (48.1)	109 (49.5)	533 (41.5)
Drink alcohol	77 (38.5)	109 (36.3)	162 (53.8)	155 (58.7)	74 (33.6)	577 (44.9)
Other drugs	6 (3.0)	4 (1.3)	1 (0.3)	4 (1.5)	3 (1.4)	18 (1.4)

Table 3. Household data before the COVID-19 outbreak

Household information before the outbreak of COVID-19	Sample population; n (%)					
	Bangkok (n=200)	Central (n=300)	Northern (n=301)	Northeast (n=264)	Southern (n=220)	Total (n=1,285)
Average monthly income of the family (Baht)						
<5,000	25 (12.5)	60 (20.0)	43 (14.3)	31 (11.7)	23 (10.5)	182 (14.2)
5,001 to 10,000	37 (18.5)	65 (21.7)	86 (28.5)	72 (27.3)	69 (31.4)	329 (25.6)
10,001 to 20,000	61 (30.5)	75 (25.0)	77 (25.6)	94 (35.6)	66 (30.0)	373 (29.0)
20,001 to 30,000	40 (20.0)	50 (16.7)	57 (18.9)	42 (15.9)	46 (20.9)	235 (18.3)
30,001 to 40,000	11 (5.5)	22 (7.3)	18 (6.0)	13 (4.9)	10 (4.5)	74 (5.8)
40,001 to 50,000	10 (5.0)	7 (2.3)	8 (2.7)	7 (2.7)	3 (1.3)	35 (2.7)
>50,000	11 (5.5)	6 (2.0)	9 (3.0)	2 (0.8)	2 (0.9)	30 (2.3)
Do not know	5 (2.5)	15 (5.0)	3 (1.0)	3 (1.1)	1 (0.5)	27 (2.1)
Characteristics of family income each month						
Have more income than expenses	34 (17.0)	54 (18.0)	71 (23.6)	26 (9.8)	52 (23.6)	237 (18.5)
Have income, but not left to saving	86 (43.0)	166 (55.3)	147 (48.8)	139 (52.7)	110 (50.0)	648 (50.4)
Not having enough income for some months	57 (28.5)	61 (20.3)	59 (19.6)	83 (31.4)	38 (17.3)	298 (23.2)
Not having enough income/no income	23 (11.5)	19 (6.4)	24 (8.0)	16 (6.1)	20 (9.1)	102 (7.9)

Table 4. General household data during the COVID-19 pandemic

General information During the COVID-19 outbreak	Sample population: n (%)					
	Bangkok (n=200)	Central (n=300)	Northern (n=301)	Northeast (n=264)	Southern (n=220)	Total (n=1,285)
Average monthly income of the family (Baht)						
<5,000	67 (33.5)	120 (40.0)	90 (29.9)	85 (32.2)	61 (27.7)	423 (32.9)
5,001 to 10,000	70 (35.0)	74 (24.7)	108 (35.9)	92 (34.9)	81 (36.8)	425 (33.1)
10,001 to 20,000	33 (16.5)	56 (18.7)	66 (21.9)	56 (21.2)	60 (27.2)	271 (21.1)
20,001 to 30,000	12 (6.0)	17 (5.7)	16 (5.3)	17 (6.4)	14 (6.4)	76 (5.9)
30,001 to 40,000	6 (3.0)	14 (4.7)	8 (2.7)	5 (1.9)	1 (0.5)	34 (2.6)
40,001 to 50,000	4 (2.0)	2 (0.6)	3 (1.0)	5 (1.9)	2 (0.9)	16 (1.2)
>50,000	2 (1.0)	3 (1.0)	7 (2.3)	0 (0.0)	0 (0.0)	12 (1.0)
Don't know	6 (3.0)	14 (4.6)	3 (1.0)	4 (1.5)	1 (0.5)	28 (2.2)
Characteristics of family income each month						
Have more income than expenses	13 (6.5)	20 (6.6)	22 (7.4)	7 (2.7)	16 (7.3)	78 (6.1)
Have enough income, but not left to saving	43 (21.5)	99 (33.0)	91 (30.2)	69 (26.1)	72 (32.7)	374 (29.1)
Not having enough income for some months	65 (32.5)	119 (39.7)	100 (33.2)	81 (30.7)	75 (34.1)	440 (34.2)
Not having enough income/no income	79 (39.5)	62 (20.7)	88 (29.2)	107 (40.5)	57 (25.9)	392 (30.6)

Table 5. Impact of the COVID-19 pandemic

Impact and problem management from COVID-19 pandemic	Sample population: n (%)					
	Bangkok (n=200)	Central (n=300)	Northern (n=301)	Northeast (n=264)	Southern (n=220)	Total (n=1,285)
Families have stress levels; median (P25-P75)	6 (5 to 8)	5 (4 to 7)	4 (2 to 7)	6 (3 to 7)	4 (1 to 7)	5 (3 to 7)
Families have ways to reduce stress						
Do not have/do not know what to do	123 (61.5)	239 (79.7)	280 (93.0)	242 (91.7)	166 (75.5)	1,050 (81.7)
Have a guideline	77 (38.5)	61 (20.3)	21 (7.0)	22 (8.3)	54 (24.5)	235 (18.3)
Economic impact						
Not affected	14 (7.0)	34 (11.3)	32 (10.6)	43 (16.3)	27 (12.3)	150 (11.7)
Less affected	5 (2.5)	26 (8.7)	26 (8.6)	25 (9.5)	46 (20.9)	128 (9.9)
Moderate affected	70 (35.0)	130 (43.3)	123 (40.9)	98 (37.1)	65 (29.5)	486 (37.8)
Very affected	80 (40.0)	92 (30.7)	104 (34.6)	89 (33.7)	69 (31.4)	434 (33.8)
Severely affected	31 (15.5)	18 (6.0)	16 (5.3)	9 (3.4)	13 (5.9)	87 (6.8)

Table 6. Prevalence of violence against women and family members by region

Violence against women and family members	Sample population; n (%)					
	Bangkok (n=200)	Central (n=300)	Northern (n=301)	Northeast (n=264)	Southern (n=220)	Total (n=1,285)
No family violence	114 (57.0)	217 (72.3)	150 (49.8)	120 (45.5)	142 (64.5)	743 (57.8)
Family violence	86 (43.0)	83 (27.7)	151 (50.2)	144 (54.5)	78 (35.5)	542 (42.2)
Family violence: aspects						
• Mental	73 (36.5)	73 (24.3)	132 (43.9)	123 (46.6)	65 (29.5)	466 (36.3)
• Physical	1 (0.5)	2 (0.7)	0 (0.0)	0 (0.0)	1 (0.5)	4 (0.3)
• Sex	0 (0.0)	1 (0.3)	4 (1.3)	0 (0.0)	1 (0.5)	6 (0.5)

Table 7. Family smoking by region

Family smoking	Sample population; n (%)					
	Bangkok (n=200)	Central (n=300)	Northern (n=301)	Northeast (n=264)	Southern (n=220)	Total (n=1,285)
No family member smokes	92 (46.0)	205 (68.3)	207 (68.8)	137 (51.9)	111 (50.5)	752 (58.5)
There is a family member who smokes	108 (54.0)	95 (31.7)	94 (31.2)	127 (48.1)	109 (49.5)	533 (41.5)

as follows.

1. Family characteristics found that at least one member in 45.6% of the extended family household were smokers, and 34.3% of household were non-smokers.

2. In thirty-five-point-six percent of the insufficient income or needy in some months households, and 32.2% of the insufficient income or no income households, there was at least one smoker member in the family, which more often than family that were non-smokers at 33.2% and 28.7%, respectively.

3. Factors affecting the family economy, the very affected and severely affected had the highest smoking rate at 43.7% of at least one family members smoking while 38.3% were non-smokers. This was followed by moderately affected families at 38.5% of family with at least one member smoked while 37.4% were non-smokers.

4. The family stress level factor showed that families with smokers had higher stress levels than non-smokers family.

5. Family violence factors found that 46.2% of family where at least one member smoked had family violence while 39.4% of family were non-smokers as shown in Table 8.

A logistic regression analysis was used to study general family data associated with smoking among family members under the COVID-19 pandemic situation. It was found that the family factor affecting smoking in the family were as shown on Table 9.

1. Families affected by the economy and stress levels had no different effect on family smoking during COVID-19 pandemic.

2. Extended family had a statistically significant effect on family smoking during COVID-19 pandemic at 1.53 times more than on single families (adjusted OR 1.53, 95% CI 1.21 to 1.94).

Table 8. Relationship of family variables with family members' smoking during COVID-19 pandemic

Family variable	Have smoking in the family (n=533)	No smoking in the family (n=752)	p-value
Township; n (%)			0.080
Urban	246 (45.4)	287 (38.6)	
Suburb	296 (54.6)	456 (61.4)	
Family characteristics; n (%)			<0.001
Single family	256 (48.0)	418 (55.6)	
Extended family	243 (45.6)	258 (34.3)	
Single parenting family	16 (3.0)	43 (5.7)	
Skipped generation family	18 (3.4)	33 (4.4)	
Characteristics of family income each month; n (%)			0.005
Have more income than expenses	19 (3.6)	59 (7.9)	
Have enough income, but not left to save	147 (27.6)	227 (30.2)	
Not having enough income for some months	190 (35.6)	250 (33.2)	
Not having enough income/no income	177 (33.2)	216 (28.7)	
Economic impact; n (%)			0.014
Not affected - less affected	95 (17.8)	183 (24.3)	
Moderately affected	205 (38.5)	281 (37.4)	
Very affected - severe affected	233 (43.7)	288 (38.3)	
Families have stress levels; mean±SD	5.16±2.84	4.77±2.83	0.015
Domestic violence on at least one area (mental, physical, sex); n (%)			0.015
Violence families	246 (46.2)	296 (39.4)	
Non-violence families	287 (53.8)	456 (60.6)	

SD=standard deviation

Table 9. Factors associated with family smoking during the COVID-19 pandemic

Family variable	Univariate		Multivariate	
	ORcrude (95% CI)	p-value	ORadj (95% CI)	p-value
Family characteristics				
Single family	Reference			
Extended family	1.54 (1.22 to 1.94)	<0.001	1.53 (1.21 to 1.94)	<0.001
Single parenting family	0.61 (0.34 to 1.10)	0.101	0.59 (0.32 to 1.07)	0.082
Skipped generation family	0.89 (0.49 to 1.62)	0.703	0.84 (0.46 to 1.54)	0.580
Characteristics of family income each month				
Have more income than expenses	Reference			
Have enough income, but not left to saving	2.01 (1.15 to 3.51)	0.014	2.02 (1.15 to 3.55)	0.014
Not having enough income for some months	2.36 (1.36 to 4.09)	0.002	2.29 (1.31 to 3.98)	0.003
Not having enough income/no income	2.54 (1.46 to 4.43)	0.001	2.41 (1.38 to 4.22)	0.002
Economic impact				
Not affected - less affected	Reference			
Moderately affected	1.40 (1.04 to 1.91)	0.029		
Very affected - severe affected	1.56 (1.15 to 2.11)	0.004		
Families have stress levels	1.05 (1.01 to 1.09)	0.015		
Domestic violence on at least one area (mental, physical, sex)				
Non-violence families	Reference			
Violence families	1.32 (1.06 to 1.65)	0.015	1.31 (1.04 to 1.65)	0.020

OR_{crude}=crude odds ratio; OR_{adj}=adjusted odds ratio

3. The monthly family income with sufficient income, but no saving had greater effect on their families smoking than on families with more income than expenditures at 2.02 times, which was statistically significant (adjusted OR 2.02, 95% CI 1.15 to 3.55). The family income of insufficient income and needy

for some month had greater effect on family smoking than families with more income than expenditures at 2.29 times, which was statistically significant (adjusted OR 2.29, 95% CI 1.31 to 3.98). The family income of insufficient income or no income affected family smoking more than families with more income than expenditures at 2.41 times, which was also statistically significant (adjusted OR 2.41, 95% CI 1.38 to 4.22).

4. At least one aspect of family violence, be mental, physical, or sexual, were 1.31 times more likely to affect family smoking in COVID-19 pandemic than the non-violent families with statistical significance (adjusted OR 1.31, 95% CI 1.04 to 1.65) as shown in Table 9.

Discussion

The present study is an overview of Thailand under the COVID-19 pandemic. The results showed that the prevalence of having at least one smoker among a Thai family was 41.5%. This is a decrease compared to the 2017 study by Kongsakon before the COVID-19 pandemic, which found that 48.9% of families surveyed had at least one family member that smoked[8]. Consistent with the present study, Kayhan Tetik et al found that the success rate of smoking cessation over one year among pre-COVID-19 patients was 23.7%. When studying the success of smoking cessation during the COVID-19 pandemic, 31.1% of people succeeded quitting smoking[9]. It can be explained because during the COVID-19 pandemic, Thailand has campaigned on the dangers of smoking and that the people infected with COVID-19 can get more severe COVID-19 as well as an increased risk of contracting COVID-19, thus resulted in a decrease in smoking among Thai families.

The present study showed that the factors related to smoking among family members were statistically significant, namely family characteristics, monthly family income, and domestic violence. Family characteristics found there is a 1.53 time more probability that at least one of the members of the extended families smoked cigarettes than in the single families, consistent with the study of Jarungjitaree et al, which found that women whose family members smoked were 3.5 times higher than those in non-smokers[10]. The extended families have members of many generations. Therefore, there is a higher chance that a family member smokes. Additionally, when a family member smoked, it causes imitation behavior, thus, other members may smoke. The extended family was related to the smoking of the family members.

The family income effect found that families with insufficient income/no income had 2.02 to 2.41 times more smoking family members than families with more income than expenditures. This is consistent with the study by Jarungjitaree et al, that low family incomes have a five times greater influence on smoking[10].

The present study found that Thai families with family members who smoked under the COVID-19 outbreak were 1.31 times more potential for domestic violence compared to the families of non-smokers. Consistent with the study of Haupala et al, that Thai families, with family members who smoked were 1.63 times more potential for domestic violence[11]. In conclusion, family members' smoking is associated with domestic violence, during the COVID-19 outbreak or in normal situation.

Conclusion

From the present study during the outbreak of COVID-19, some family members smoked in 41.5% of Thai household. Smoking is the leading cause of death. It affects the health of all systems and directly affecting the lungs. Covid-19 causes pneumonia. Smoking does not only exacerbate COVID-19 symptoms also increases the risk of contracting the virus, especially if smoked in the household as it increases the chances of family members being affected by the virus. Therefore, smoking cessation should be in the guidelines for the treatment of COVID-19. Because the patients could see the effects, one-third of COVID-19 patients who smoke were motivated to quit[12]. The Department of Disease Control should have a campaign on the impact of smoking on health and COVID-19 as well as continue the campaign of smoke-free homes. From the previous studies, awareness of the impact of media campaigns made smokers more likely to quit.

What is already known on this topic?

Factors related to smoking in Thai families were alcohol usage, substance abuse, and domestic violence. However, there was limited data about smoking in Thai families and factors related to family smoking.

What this study adds?

This study shows that during the COVID-19 pandemic, the prevalence of smoking in Thai families has a relationship with extended family, domestic violence, and insufficient or no income. Therefore, the health care providers should assess these factors

and help the smokers quit smoking.

The prevalence of smoking among Thai families during the pandemic decreased to 41.5% from 48.9% in 2017 prior to the pandemic, due to the campaign of dangers of smoking and the COVID-19 infection.

Conflicts of interest

The authors declare no conflict of interest.

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