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Tobacco Use during Ramadan Practices amidst the COVID-19 Pandemic in the Deep South of Thailand

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Abstract: The article describes a new method for the cross-sectional descriptive research that has been affected by the COVID-19 pandemic in the current global. The proposed method aimed to survey household tobacco use during Ramadan fasting in the 5 southernmost provinces by the internet collecting data during May - June 2020. The 880 household samples living for 1 year or more in Satun, Songkhla, Pattani, Yala, and Narathiwat were sampled by stratified two-stage sampling. The eligible samples, both male and female, aged 18 years and over, were then simple random sampling to access the online questionnaires with a specific ID. The calculation confirmed the new method effectiveness evaluation by obtaining an OIC greater than 0.90 for content validity and a Cronbach's alpha larger than 0.85 for reliability. A total of 850 returned questionnaires provided a % response of 93.50 and finally analysed using descriptive statistics such as percentage, mean, and standard deviation. The results revealed the rapid response that: (1) in the previous year before a COVID-19 outbreak, of the 850 households, 562 were non-smoking households (66.12 %) and 288 tobacco smoking households (33.88 %). (2) For this year, there were 668 non-smoker household members (78.58%), 111 current smokers (13.06%), and 71 ex-smokers (8.35%). A mixed tobacco product use was 60.42% roll-your-own cigarettes, 51.39% of factory-made cigarettes, 2.08% of e-cigarettes, and 1.39% hookahs. There were 42.01% attempt to quit, 47.22% intend to quit, and 10.76 % continue to smoke during the COVID-19 pandemic. A new research method obtained the facts contributing to the creation of public policy for tobacco control at the community level during the pandemic situation. The online method can be applied for returning to the new normal posing new challenges to improve the household responses during a pandemic outbreak.

Keywords: COVID-19, Deep South, Ramadan fasting, Thailand, tobacco use.

泰国深南部新冠肺炎大流行期间斋月期间的烟草使用

摘要：本文介绍了一种横断面描述性研究的新方法，该方法已受到当前全球新冠肺炎大流行的影响。提议的方法旨在通过互联网在 2020 年 5 月至 2020 年 6 月间收集数据来调查最南部 5 个省斋月斋戒期间的家庭烟草使用。生活在沙敦府，宋卡府，北大年府，惹拉和那拉提瓦府的 880 个居住一年或以上的家庭样本为通过分层两阶段抽样进行抽样。然后对符合条件的男性和女性样本（年龄在 18 岁以上）进行简单的随机抽样，以访问具有特定个人身份证号码的在线问卷。该计算通过获得重叠指数大于 0.90 的内容有效性和克朗巴赫的 α 大于 0.85 的可靠性来确认新方法的有效性评估。总共 850 份返回的问卷提供了 93.50%的百分比答复，最后使用描述性统计数据进行了分析，例如百分比，均值和标准差。结果显示了快速的响应：（1）在新冠肺炎爆发之前的上一年，在 850 户家庭中，有 562 户为非吸烟家庭（占 66.12%）和 288 户吸烟家庭（占 33.88%）。（2）今年，有 668 位非吸烟家庭成员（78.58%），111 位目前吸烟者（13.06%）和 71 位前吸烟者（8.35%）。混合烟草产品的

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使用是 60.42％的自卷烟，51.39％的工厂制卷烟，2.08％的电子烟和 1.39％的水烟袋。在新冠肺炎大流行期间，有 42.01％的人试图戒烟，有 47.22％的人打算戒烟，还有 10.76％的人继续吸烟。一种新的研究方法获得了有助于在大流行期间在社区一级制定公共控烟政策的事实。在线方法可用于恢复新的常态，从而构成新的挑战，以改善大流行爆发期间家庭的反应。

关键字：新冠肺炎，深南，斋月斋戒，泰国，烟草使用。

1. Introduction

To prevent the burden of non-communicable diseases (NCDs), Thailand is progress in implementing the WHO Framework Convention on Tobacco Control (FCTC) in ASEAN countries, such as raising taxes on tobacco, establishing smoke-free areas, health warnings [1], and including the tobacco display ban. The scenario model also presented that the combined tobacco control policies would reduce tobacco use prevalence and decrease deaths in 2025 [2]. For example, smoking prevalence presents the percentage of men and women ages 15 and over who currently smoke any tobacco product daily or non-daily, excluding smokeless tobacco use for 2018 at 22.80% (0.8% decline from 2016). However, in every national survey, the Deep South smoking prevalence is the highest compared to other parts of Thailand. The several tobacco use-relating factors described for high prevalence in this area are hand-rolled cigarettes, cheaper smuggling cigarettes, lower socioeconomic characteristics such as income and education, and accessibility to smoking cessation services [3]. Since there are mainly Muslims whose religion is Islam in the Deep South, tobacco smoke self- quitting is based on faith. In every Ramadan, intermittent fasting—a non-pharmacological intervention refining the overall health [4], most Muslim smokers intend to quit smoke for their health and complete their spiritual practices. Recently, Ramadan fasting coincided with the COVID-19 pandemic during 24 April – 22 May 2020. It has been well described that the coronavirus disease (COVID-19) infection is caused by the novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) primarily affecting the lungs. Besides, Tobacco use in all forms is significantly associated with severe COVID-19 outcomes [5]. That is a major public concern for tobacco smoke amidst the COVID-19 Pandemic in 2020. However, the safe outdoor survey during the COVID-19 pandemic is a major concern, such as the risks to staff and local communities of conducting data collection during the COVID-19 outbreak. The authors have attempted to develop recruitment, sampling, and analytical methods to overcome this situation. Thus, this article aims to assess the prevalence of cigarette smoking and smoking behaviours among Thai people aged 15 years and over during Ramadan fasting under the COVID outbreak situation using a rapid internet survey in the southernmost provinces of Thailand.

2. Literature Review

Smoking is considered an epidemic due to serious global public health problems. Tobacco use is a major risk factor for 4 non-communicable diseases—cardiovascular disease, cancer, chronic lung disease, diabetes, and even death from many respiratory infections in low- and middle-income countries [6]. It is also a risk factor for infectious diseases, tuberculosis, lower respiratory infections, and SARS-CoV-2 or COVID-19. Active smoking is associated with increased severity of disease and death in hospitalized COVID-19 patients in many countries [7]. The role of tobacco smoke in exposure affects COVID-19 in the air-liquid interface can increase infected airway cells with a lack of airway basal stem cells proliferation and reduce the normal interferon response [8]. Tobacco smoke also causes a dose-dependent upregulation of angiotensin-converting enzyme 2 (ACE2) [9], a functional receptor for SARS-CoV, which now appears likely to mediate novel coronavirus (2019-nCoV) entry into human cells [10]. The severity of the rapid spread of SARS-CoV-2 leads to the COVID-19 pandemic associated with respiratory tract infections, with more than 2,400,000 deaths worldwide [11]. Recently, 111,762,965 confirmed cases of COVID-19, including 2,479,678 deaths, reported to WHO [12]. The COVID-19 pandemic also reveals inequalities regarding gender, racial, and ethnic health disparities associated with active smoking [13]. The determining factors in mitigating the pandemic are closed containment, adequate public health strategies, and the importance of indoor environments [14], including tobacco control and returning to a “new normal” [15]. For Muslims, Ramadan intermittent fasting offers a good opportunity for smokers to quit by themselves due to abstention from smoking for over 12 hours a day each year. Being a smoker while fasting is challenging because the process of quitting smoking is complex and often unsuccessful. However, the tobacco smoke prevalence

during Ramadan fasting amidst a novel coronavirus pandemic in 2020 remains limited.

3. Methods

In this study, the web survey was the main strategy used to obtain primary data and has been performed since COVID 2019 emerged. A cross-sectional descriptive study design was carried out to survey household tobacco use during Ramadan fasting under the coronavirus outbreak in the 5 southernmost provinces. First, a provincial's probability for selection was proportional to its enrolment size for the survey using e-mail or Line application lists. The collected data was then carried out in May - June 2020 from 880 household samples and received back 850 samples given a percentage of response of 96.59. In this study, a stratified two-stage sampling design was used for sample recruiting: village districts were first selected, and then the households within the provinces' geographical regions. Eligible samples were finally randomly selected within each household.

To ensure the validity of the questionnaires, the authors established content validity by using expert panels that provided an IOC: Index of item objective congruence greater than 0.90. For the reliability of the questionnaire, Cronbach's α coefficient was used to determine the internal consistency that presented larger than 0.85. Before widely deploying the internet survey, a pilot study was carried out to validate its content and proper anonymization with a small sample of participants.

3.1. Participants

The study population for this analysis comprised individual residents in the Deep South, Thailand, aged 15 years and over were residents in the 5 southernmost provinces—Satun, Songkhla, Pattani, Yala, and Narathiwat at least one year. These participants were recruited through the village volunteers. They were voluntary and anonymous with written informed consents, registered with the online linkage, and entered data between May to June 2020.

The target sample size was estimated based on the estimation of the previous smoking proportion in the Deep South population size (p=0.24), using a confidence level of 95%, a margin of error of 5%, and 1.5 of design effect; thus, the required sample size was to be at least 415 participants.

3.2. Data Collection and Analysis

A self-administered survey with a specific ID was developed and validated to solicit anonymous responses via online link living in Thailand's southernmost provinces. The online survey's first page presented the information needed for informed consent to participate; participants then completed screening questions to determine eligibility. Participants responded to the questionnaires for their houses and family members, socio-demographic characteristics, tobacco product use, and knowledge related to COVID-19 exposure factors. The study was approved by the Human Research Ethics Committee, Review Board of Public Policy Institute, Prince of Songkla University (Ref. no EC 008/63).

A standardized questionnaire was completed, including household data, socio-demographic characteristics, and smoking behavior. Demographic questions assessed participants' age, gender, level of education, employment status, and monthly income. The quantitative data were gathered from the questionnaires and then analyzed by descriptive statistics such as percentage, mean, standard deviation. Categorical data were shown as absolute frequencies and percentages. Continuous data were presented as means ± standard deviation (SD).

4. Results and Discussion

In total, data were collected from 880 households, and eligible samples (1 person per household) responded as 850 persons making a response rate of 96.59%.

4.1. Household Data

Those who reported their housing varied in type, air ventilation, and family members presented in Table 1. In brief, most households were 80.24% detached houses, 89.18% good ventilation, and 59.18% 4-6 members/houses. The majority age group 25 and 59 years was 94.23%, and the minority was 73.64% aged 13-24 years. The household income were 10,000-49,999 baht per month (42.35%) and 24.71% 1,000-9,999 baht per month. The household members smoked and never smoked tobacco the previous year, equal to 33.88% and 66.12%, respectively, and having children aged less than 12 years to 93.06%.

Table 1 Household data (N=850)

Household factors	Number (house)	Percentage
1. Types of Houses		
Detached house	682	80.24
Townhouse/ Flats	130	15.29
Semi-detached house	38	4.47
2. House ventilation		
Good	758	89.18
Fair	87	10.24
Poor	5	0.59
3. Number of members		
1-3	211	24.82
4-6	503	59.18
> 6	136	16.00
4. Age groups of members (years)		
0-2	130	15.29
3-5	228	26.82
6-12	334	39.29
13-24	626	73.64
25-59	801	94.23
>60	327	38.47
5. Household income per month (baht)		
0-999	100	11.76

1,000-9,999	210	24.71
10,000-49,999	360	42.35
>50,000	180	21.18
6. Tobacco smoking of members (previous year)		
Smoke	288	33.88
Non-smoke	562	66.12
7. Health risk groups to tobacco smoke		
Children< 12 years	791	93.06
Pregnant	39	4.59
Respiratory symptoms	20	2.35

4.2. Respondent Demographic Data

The study sample consisted of Muslim 77.06%, Buddhist 22.12%, and Crist 0.82%. Among these, more than half were 62.12% female, age group 54.12% 25-59 years, and 66.94% married, 64.24% higher degree completed level, 69.65% employed, and 50.59% capita income between 10,000 to 49,999 baht a month. Samples reported themselves from the various provinces: Satun, Songkhla, Pattani, Yala, and Narathiwat equal to 14.24%, 23.53%, 27.88%, 16.82%, and 17.53%, respectively. There were 78.58% non-smokers, 13.06 % of current daily tobacco smokers, and 8.35% ex-smokers. These characteristics were presented in Table 2.

Table 2 Socio-demographic characteristics of respondents

Socio-demographic variables	Number (person)	Percentage
1. Age of respondents (years)		
15-24	150	17.64
25-59 years	460	54.12
> 60 years	240	28.24
2. Gender		
Female	528	62.12
Male	317	37.29
Prefer not to answer	5	0.59
3. Religion		
Buddha	188	22.12
Christ	7	0.82
Islamic	655	77.06
4. Marital status		
Single	241	28.35
Married	569	66.94
Widowed / Divorced / Separated	40	4.71
5. Education		
Primary completed	70	8.24
Secondary completed	162	19.06
Diploma	67	7.88
Higher degree completed	546	64.24
Prefer not to answer	5	0.59
6. Provincial Residence		
Satun	121	14.24
Songkhla	200	23.53
Pattani	237	27.88
Yala	143	16.82
Narathiwat	149	17.53
7. Occupation/Working status		
Employee/Worker	592	69.65
Unemployed	100	11.76
Studying	100	11.76
Retired	58	6.82
8. Income per capita (baht)		
0-999	80	9.41
1,000-9,999	240	28.24
10,000-49,999	430	50.59
>50,000-100,000	100	11.76
9. Tobacco smoking status for each respondent during Ramadan Practices		
No smoking at all	668	78.58
Current tobacco smoking	111	13.06
Past smoking (Ex-smoker)	71	8.35

4.3. Tobacco Smoking Behavior among Household Members

Among the participants and member households were current daily smokers, at least one person, 26.71%. Most tobacco products use were 60.42% rolled cigarette, 51.39% factory cigarette, 2.08% e-cigarette, and 1.39% Hookah. Of all the smokers were 42.01% attempt to quit, 47.22% intend to quit, and 10.76% never. For smoking cessation services, they reported that 35.42% never know or never a client, 28.13% know but never a client, and know but never a client, 9.03% know and used to be a client, and 27.43% quit by themselves. At the end of Ramadan fasting, they decided to quit smoke at least one person (60.76%), but at least one person insisted on being continuing smokers (42.71%). All data are provided in Table 3.

Table 3 Tobacco smoking behavior among current household smokers (N = 288)

Daily smoker	Number (persons)	Percentage
1. Number of current smokers (daily use) in household		
At least 1 person	227	26.71
More than 1 person	61	7.18
2. Regular tobacco products use (select more than one type)		
Roll-your-own	174	60.42
Factory cigarette	148	51.39
Electronic cigarette	6	2.08
Hookah	4	1.39
3. Attempts to quit smoking		
Past quit attempts	121	42.01
Intent to quit	136	47.22
Never	31	10.76
4. Smoking cessation services		
Never know or never a client	102	35.42
Know but never a client	81	28.13
Know and used to be a client	26	9.03
Other (Self-motivation to quit)	79	27.43
5. Expenditures per capita for tobacco use (Baht/month)		
1-100	30	10.42
101-1,000	240	83.33
1,001-10,000	18	6.24
6. Decide to quit smoke at the end of Ramadan		
Do not intention	113	39.24
At least 1 person	175	60.76
7. Continue to smokers at the end of Ramadan		
At least 1 person	123	42.71
Intend to quit	165	57.29

Since Thailand signed the WHO Framework Convention on Tobacco Control (FCTC) on 8

November 2004, various tobacco control measures have existed. The findings in this study—tobacco cigarette smoking status among participants, are also the outcomes of these efforts. Deep South households presented that they smoked and never smoked tobacco the previous year, equal to 33.88% and 66.12%, respectively. Besides, the tobacco smoke individual members remained 13.06 % during Ramadan fasting amidst the COVID-19 pandemic in the Deep South of Thailand. While, in the country with a low smoking prevalence rate in 2020 were Iceland (14.7%), Sweden (18.8%), Denmark (19.1%), Norway (20.2%), and Finland (20.4%)[16]. The explanation for tobacco uses reduction during Ramadan fasting, and the COVID-19 outbreak are several possible reasons. First, major decisions and actions for health are acceptable under the distress of COVID-19 and a special Holy month of Ramadan. The strong evidence revealed that the COVID-19 patients with a history of cigarette smoking tend to have more severe outcomes than non-smoking patients [17]. Thus, awareness about tobacco use due to adverse health consequences during the COVID-19 outbreak is involved in smoking decline. Second, people need to decrease their tobacco use expenditures due to the economic consequences of the COVID-19 outbreak, such as significant reductions in income and a rise in unemployment [18]. Besides, tobacco expenditure has significant negative impacts on other basic expenditures and household resource allocation [19]. However, there are several factors of concerns for people in the Deep South of Thailand. The social determinants of smoke exposure due to socioeconomic status, accommodations, vulnerable groups, and tobacco quitting service accessibility are also revealed in this study.

First, the relationship between poverty or socioeconomic inequalities and tobacco consumption has been known that the socioeconomic status indicators, such as education, employment or occupational status, and household income, are negatively associated with smoking in several reports. In this study, although the most education level was higher degree completed, working status, moderate household income, and good ventilation in housings, there were highly vulnerable groups, such as children and pregnant. These are risk groups to secondhand and third-hand tobacco smoke within their house or their environments. After the tobacco smoke has been emitted into the air, the tobacco-related gases and particulate contamination persist in several places. All household members who used tobacco products in this study consisted of rolled cigarettes, factory cigarettes, hookah, and e-cigarettes that are tobacco product emissions. These smoke emissions affect prenatal and postnatal secondhand smoke exposure to child health and development. Although the perceptions of tobacco products' harmfulness didn't involve in this study, roll-your-own, e-cigarettes, and hookah are believed as less harmful compared to factory cigarettes in the smoker understanding. Second, more than 80% of daily smokers attempted to quit and intend to quit in this study, but most didn't know or access quitting services. The proactive services are challenging to deal with smokers and allocate them to the cessation. During the COVID-19 outbreak, most face-to-face counselling stopped except telephone counselling and application for smoking cessation. Some studies conclude that proactive telephone counselling aids smokers who seek help and increases quit rates in some settings [20]. Third, law enforcement's potential role should act, such as smoking prohibition in public and inside accommodations. Future household awareness and enforcement efforts due to smoke-free home policy should focus on all tobacco use forms, especially targeting vulnerable groups in households. Fourth, the natural religious faith-based tobacco smoke cessation for various beliefs and sub-cultural concerns should be discovered along with the multi-cultural context of Deep South, Thailand.

Among the various kinds of surveys to ensure no harm, this study designed to use the e-survey instead of the face-to-face or telephone interviews method for collecting data during the COVID-19 pandemic. The use of online and mobile research methods provided a rapid response, low cost, flexibility, and overall convenience. For instance, research tools can be programmed even if they're very complex. Intricate skip patterns and logic can be employed seamlessly. Researchers can create the layout, questions, and answer choices with no hassle or confusion. Consequently, the questionnaire has several strengths. Besides, this method can always ensure the protection and safety of both staff members and members of local communities. It can be assumed that the method with some minor modifications will also apply to users in different regions.

This study's limitation was that certain samples were less likely to have internet access and respond to online questionnaires in urban and rural areas, which brought to a possible selection bias. In addition, all participants volunteered to fill out the survey without any incentive may cause self-reported bias and sampling bias like other studies [21].

5. Conclusion

The main findings in this study revealed the prevalence of tobacco smoke among member households aged 15 years and over was 13.06 % during Ramadan fasting amidst the COVID-19 pandemic in the Deep South of Thailand due to a possible implementation of the WHO FCTC nearly 2 decades. However, several factors were involved in tobacco control under this situation and new normal, such as vulnerable groups, proactive cessation service accessibility, and law enforcement in smoke-free environments both inside accommodations and external

environments. Besides, the study highlights the importance of considering the method to quickly assess the problems during uncertain situations due to the COVID-19 pandemic. A further large-scale online survey has been applied to be an effective tool for this purpose.

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