

Readiness in Response the Epidemic of Coronavirus Disease-2019 (COVID-19) among Young Adults in Chiang Rai Province, Thailand

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ABSTRACT

Background: Coronavirus disease 2019 (COVID-19) is currently recognized as the greatest threat to human life, with a large number of deaths. It is rapidly spreading, including to people living in rural areas, through several mechanisms, including population movement. Chiang Rai Province is located in rural northernmost Thailand and has a long border with neighboring countries. This study aimed to assess the readiness of young adult people living in Chiang Rai Province to the epidemic of COVID-19. **Methods:** A cross-sectional study was used to collect data from the participants. The study setting was Chiang Rai Province, Thailand. People aged 18-23 years living in selected villages and individuals at a university were invited to participate in the study. A validated questionnaire was used to collect data from the participants. A chi-square test was used to detect the associations between the variables at the significance level of $\alpha=0.05$. **Results:** A total of 315 participants were recruited into the study; 65.7% were female, and 54.0% were aged 20-21 years. One-third had a chronic disease (34.6%) and had been immunized with the flu vaccine in 2019 (32.1%). A few people were diagnosed with flu in 2019 (2.9%) and 2020 (1.6%). The majority received information related to COVID-19 through television (51.7%) and the Internet (41.3%); however, only 31.1% responded that they had sufficient information. The majority had a poor level of knowledge regarding COVID-19 prevention and control (67.9%), while a few people had good perceptions of COVID-19 prevention and control (1.6%). Only 29.5% had good skills for COVID-19 prevention and control. **Conclusion:** Young adult people in Chiang Rai Province are living with poor knowledge, perception and skills to prevent and control COVID-19. Effective prevention and control measures are required to prevent people in rural areas, such as people living in Chiang Rai Province, from infection by COVID-19.

Keywords: COVID-19, Readiness, Knowledge, Perception, Young adult

Introduction

Since the first unknown-cause pneumonia case was detected in China and officially reported to the World Health Organization (WHO) in December 2019, there have been 509,164 confirmed cases and 23,335 deaths reported globally (as of 27 March 2020) [1]. A total of 2,932 cases were reported from the South-East Asia Region (SEAR), among which 105 cases died [1]. Thailand has been reported to rank first among the countries in the SEAR [1]. On March 28, 2020, the Department of Disease Control, Ministry of Public Health, Thailand, reported that the number of cumulative confirmed cases of COVID-19 was 1,245 cases and 6 deaths [2].

Currently, COVID-19 is identified as the major human threat and has killed a number of people around

the world [3]. People of older age and those with previous health conditions are most vulnerable to infection and death. With the high capability of the disease to spread and the severity of its pathogenesis, humankind is facing serious problems, especially in countries with scarce resources in their health care systems to save victims' lives, particularly during the crisis period of the disease. It is clear that the most effective measure is to prevent infection from the disease. Several control and prevention measures have been implemented in different countries [4, 5]. The government of Thailand, which is led by the Ministry of Public Health, is intervening with various methods to reduce the possibility of spreading the disease from infected persons to others, particularly by stopping the movement of the population living in large cities to

rural areas in an attempt to avoid spreading the disease to people living in remote areas far from good health care facilities [6].

The northern region of Thailand, especially Chiang Rai Province [7], is one of the most critical areas for the epidemic of COVID-19 due to its long border with neighboring countries such as Myanmar, Lao, and southern China [8]. Due to its geographic condition of long borders, a large number of people move across the borders every day. Moreover, most people who live in poor economic and educational conditions have increased vulnerability to the infection. Many young adults who work in large cities, such as Bangkok, return to their villages on occasions such as the Songkran Festival. Many prevention and control measures have been launched in Thailand by the Thai government to prevent infection of people living in rural areas. With the movement of population who lived in high risk areas to their home villages where were lower risk of the disease. This might be increasing the possibility to get infection among those people living in the village particularly among the greatest vulnerable for the disease infection such as elderly population and also other people who had underlying disease. Therefore, this study aimed to assess the readiness among young adults who are the most valuable for contribution to respond to the COVID-19 epidemic in Chiang Rai Province particularly in the strengthening in contribution of control and prevention measures in their village, which has a long border and a high population movement rate.

Methodology

A cross-sectional study design was used to collect information from the participants. The study setting was Chiang Rai Province, Thailand. People aged 18-23 years who lived in the study area were the study population. People who were unable to provide all essential information regarding the study protocols were excluded from the study. The sample size was calculated by the standard formula [9] for a cross-sectional design. At $Z_{\alpha/2} = 1.96$, $P = 0.26$ (having good knowledge) [8], $Q = 0.73$, and $e = 0.05$, a total of 291 participants were required for the analysis.

Two groups of participants were randomly selected into the study; a) People who lived in five villages in Muang and Mae Chan Districts, Chiang Rai Province; b) student attending in a university were selected by a random method. Young adults aged 18-23 years who lived in selected villages and students aged 18-23 years in 5 programs were selected by a random method from a university and were invited to participate in the study. All participants were requested to complete the questionnaire. Data were collected between 3 March and 5 March, 2020.

A validated questionnaire was used for data collection. It was developed based on all availability information from different sources of information, such as the websites of the World Health Organization (WHO), The Centers for Disease Control and

Prevention (CDC), and the Ministry of Public Health Thailand. The opinions of medical experts and epidemiologists were also used for questionnaire development. The questionnaire had five sections. In Section I, 8 questions were used to collect the general information of the participants, such as age, sex, religion, and education. In Section II, 8 questions were used to collect all medical histories, such as chronic disease, history of receiving the flu vaccine, and history of a diagnosis of flu the previous year. In Section III, 10 questions were used to assess knowledge regarding COVID-19 prevention and control. Each question had three choices; correct, and not correct. If the participants provided the choice correctly, it was scored "1" in that item. In vice versa, if the participant provided the wrong answer, it was scored "0". In total, those participants were scored 0-5, it was defined as "low knowledge". Those participants scored between 6-8 were classified into "moderate knowledge", and those who scored equal of greater than 9 were classified into "high knowledge".

In Section IV, 10 questions were used to assess perceptions of the measures of COVID-19 prevention and control. There were two groups of the questions in this section; 5 questions were positive direction questions and another 5 questions were negative direction questions. Every question had three answer choices; agree, neutral, disagree. In every positive question, it was scored "3" "2" and "1" while people chose "agree", "neutral", "disagree", respectively. For the questions in negative direction, it was scored in the opposite way from the positive direction questions. It means that it was scored "1" "2" and "3" while people chose in "agree", "neutral", "disagree", respectively. In total, those who had been scored equal or more than 26 were classified into "high perception", while those scored between 20 to 25, and less than 20 scores, were classified into "moderate" and "low" perceptions, respectively.

In section V, 10 questions were used to assess the skills for COVID-19 prevention and control. The questions were asked on different daily life practices on prevention and control the disease such as frequency of hands washing, frequency on use face mask, etc. Each question had three answer choices; no, sometime, and very often. Anyone chose "no", "sometime", or "very often", was scored "0", "1", or "2", respectively. In total, those who had been scored 16 and over were classified into "high", and those who had been scored 10-15 and less than 10 were classified into "moderate", and "low" skill in prevention and control the disease, respectively.

The questionnaire was validated before use by the item objective congruence method (IOC) by three external experts. It was subsequently piloted in 10 similar populations in Muang District, Chiang Rai Province. Cronbach's alpha was 0.73.

All study protocols were approved by the Chiang Rai Public Health Provincial Ethical Committee (No. CRPPHO 12-2563). All selected participants were

asked to obtain the informed consent form before beginning the questionnaire.

Results

A total of 315 participants participated in the study; 65.7% were female, and 54.0% were aged 20-21 years. The majority were Buddhist (96.5%), single (100.0%), had no income (77.7%), and were studying in a university (83.5%). One-third had a chronic disease (34.6%) and had been immunized with the flu vaccine in 2019 (32.1%). A few people were diagnosed with flu in 2019 (2.9%) and 2020 (1.6%). The majority received information relevant to the disease through television (51.7%) and the Internet (41.3%); however, only 31.1% responded that they had sufficient information (Table 1).

Table 1 General characteristics of the participants

Characteristics	n	%
Total	315	100.0
Sex		
Male	108	34.3
Female	207	65.7
Age (years)		
18-19	73	23.2
20-21	170	54.0
22-23	72	22.8
Religion		
Buddhist	304	96.5
Other	11	3.5
Marital status		
Single	315	100.0
Education		
Illiterate	6	1.9
Primary school	29	9.2
High school	17	5.4
University	263	83.5
Annual income (baht)		
No income	243	77.2
<30,000	29	9.2
30,001-50,000	23	7.3
50,001-100,000	14	4.4
≥100,001	6	1.9
Number of family members (persons)		
1-3	117	37.1
4-6	182	57.8
≥7	16	5.1
Having a chronic disease		
Yes	109	34.6
No	206	65.4
Having been diagnosed with the flu in 2019		
Yes	9	2.9
No	306	97.1
Having a family member who was diagnosed with the flu in 2019		
Yes	25	7.9
No	290	92.1
Having been diagnosed with the flu in 2020		
Yes	5	1.6
No	310	98.4
Having a family member who was diagnosed with the flu in 2020		
Yes	10	3.2
No	305	96.8
Having been immunized with the flu vaccine in 2019		
Yes	101	32.1
No	214	67.9
Main channel for receiving COVID-19 information		
Television	163	51.7
Internet	130	41.3
Medical staff	22	7.0
Sufficiency of information		
Yes	98	31.1
No	217	68.9

The majority had a poor level of knowledge regarding the disease (67.9%); only 7.3% reported a good level and 24.8% reported a moderate level of knowledge of COVID-19. There were no statistically significant differences in the levels of knowledge by different profiles of participants, such as sex, age, religion, etc. (Table 2).

A few people had good perceptions of COVID-19 prevention and control (1.6%), while 58.1% had poor perceptions. Only the profile of participants with a chronic disease was found to be significantly different in the level of perception of disease prevention and control (p-value=0.002), while the other characteristics were not found to differ (Table 3).

One-third (29.5%) of the participants had good skills for COVID-19 prevention and control. However, in the comparisons of the participants' profiles and the levels of skills for COVID-19 prevention and control, a difference was found only among the different age categories, while other characteristics were not found to be significantly different (Table 4).

Discussion

Young adult people in Chiang Rai Province, Thailand, received information relevant to COVID-19 through television, but only one-third responded that they had sufficient information. These respondents had high vulnerability to disease infection due to their poor level of knowledge, poor perception and poor skills for COVID-19 prevention and control.

COVID-19 has been found to be a new emergent disease with serious pathogenesis for infected patients [10]. It has spread worldwide, and the elderly population is reported to have high morbidity compared to other groups [1,2]. Thailand has established thermal screening for all travelers from China since 3 January 2020, and on 8 January 2020, the first suspected case was reported [11].

Our study found that the young adult population in rural Thailand had poor knowledge, perception, and skills regarding COVID-19 prevention and control. However, a study in China [12] reported that people had high knowledge and personal protective skills for the disease infection. This might be because the Chinese population was exposed to the disease earlier than the Thai population. Given the serious situation in China, most Chinese have developed their knowledge and behaviors to prevent the disease.

Social distancing and isolation are recognized as effective prevention and control measures, particularly between high- and low-risk populations through migration. These methods have been implemented in different countries, including those currently facing problems, such as Thailand [6], and post-exposed countries, such as China [13]. If people in any country do not have sufficient skills in response to the COVID-19 epidemic, the health system would collapse and would not be completely effective in saving lives, as in Italy[14].

Table 2 Comparison of participants' characteristics and knowledge of COVID-19 prevention and control

Characteristics	Knowledge			χ^2	p-value
	Poor n (%)	Moderate n (%)	Good n (%)		
Total	214 (67.9)	78 (24.8)	23 (7.3)	N/A	N/A
Sex					
Male	76(70.4)	25(23.1)	7(6.5)	0.46	0.792
Female	138(66.7)	53(25.6)	16(7.7)		
Age (years)					
18-19	55(75.3)	12(16.4)	6(8.3)	4.30	0.367
20-21	109(64.1)	49(28.8)	12(7.1)		
22-23	50(69.4)	17(23.6)	5(7.0)		
Religion					
Buddhist	209(68.8)	72(23.7)	23(7.5)	4.49	0.105 ^a
Christian	5(45.5)	6(54.5)	0(0)		
Annual income (baht)					
No income	160(65.8)	65(26.7)	18(7.5)	5.78	0.215 ^a
< 30,000	20(69.0)	5(17.2)	4(13.8)		
≥ 30,001	34(79.0)	8(18.6)	1(2.4)		
Number of family members (persons)					
1-3	74(63.2)	31(26.5)	12(10.3)	4.43	0.322
4-6	126(69.2)	45(24.8)	11(6.0)		
≥ 7	14(87.5)	2(12.5)	0(0)		
Having chronic disease					
Yes	79(72.5)	25(22.9)	5(4.6)	2.41	0.299
No	135(65.5)	53(25.8)	18(8.7)		
Having flu vaccine in 2019					
Yes	67(66.3)	25(24.8)	9(8.9)	0.58	0.747
No	147(68.7)	53(24.8)	14(6.5)		
Main channel for obtaining information					
Facebook/Line/Internet	91(70.0)	33(25.4)	6(4.6)	3.69	0.449
Television	109(66.9)	38(23.3)	16(9.8)		
Medical staff	14(63.6)	7(31.8)	1(4.6)		
Sufficiency of information					
Yes	149(68.6)	52(24.0)	16(7.4)	0.23	0.887
No	65(66.3)	26(26.6)	7(7.1)		

* Significant at $\alpha=0.05$, ^aFisher's exact test

Table 3 Comparison of participants' characteristics and perceptions of COVID-19 prevention and control

Characteristics	Perception			χ^2	p-value
	Poor n (%)	Moderate n (%)	Good n (%)		
Total	183 (58.1)	127 (40.3)	5 (1.6)	N/A	N/A
Sex					
Male	62(57.4)	45(41.7)	1(0.9)	0.42	0.813 ^a
Female	121(58.5)	82(39.6)	4(1.9)		
Age (years)					
18-19	43(58.9)	29(39.7)	1(1.4)	2.15	0.714 ^a
20-21	103(60.6)	64(37.6)	3(1.8)		
22-23	37(51.4)	34(47.2)	1(1.4)		
Religion					
Buddhist	175(57.6)	124(40.8)	5(1.6)	3.60	0.165 ^a
Other	8(75.0)	3(25.0)	0(0)		
Annual income (baht)					
No income	140(57.6)	98(40.3)	5(2.1)	3.42	0.904 ^a
< 30,000	15(51.7)	14(48.3)	0(0)		
≥ 30,001	28(65.2)	15(34.8)	0(0)		
Number of family members (persons)					
1-3	64(54.7)	50(42.7)	3(2.6)	6.10	0.192 ^a
4-6	112(61.5)	69(37.9)	1(0.6)		
≥ 7	7(43.7)	8(50.0)	1(6.3)		
Having chronic disease					
Yes	51(46.8)	54(49.5)	4(3.7)	11.33	0.002*
No	132(64.1)	73(35.4)	1(0.5)		

* Significant at $\alpha=0.05$, ^aFisher's exact test

Table 4 Comparison of participants' characteristics and skills for COVID-19 prevention and control

Characteristics	Prevention and control skills			χ^2	p-value
	Poor n (%)	Moderate n (%)	Good n (%)		
Total	34 (10.8)	188 (59.7)	93 (29.5)	N/A	N/A
Sex					
Male	17(15.8)	59(54.6)	32(29.6)	4.33	0.118
Female	17(8.2)	129(62.3)	61(29.5)		
Age (years)					
18-19	3(4.1)	42(57.5)	28(38.4)	10.92	0.027 ^{*a}
20-21	26(15.3)	97(57.1)	47(27.6)		
22-23	5(6.9)	49(68.1)	18(25.0)		
Religion					
Buddhist	34(11.2)	177(58.2)	93(30.6)	N/A	N/A
Other	0(0)	11(100.0)	0(0.0)		
Annual income (baht)					
No income	27(11.1)	135(55.5)	81(33.4)	12.49	0.094
< 30,000	2(6.9)	22(75.9)	5(17.2)		
≥ 30,001-50,000	5(11.6)	31(72.1)	7(16.3)		
Number of family members (persons)					
1-3	11(9.4)	69(59.0)	37(31.6)	2.14	0.720
4-6	20(11.0)	109(59.9)	53(29.1)		
≥ 7	3(18.8)	10(62.4)	3(18.8)		
Having chronic disease					
Yes	17(15.6)	62(56.9)	30(27.5)	3.90	0.144
No	17(8.2)	126(61.2)	63(30.6)		

* Significant at $\alpha=0.05$, ^aFisher's exact test

Conclusion

Young adult people living in Chiang Rai Province, Thailand, are highly vulnerable to COVID-19 infection due to poor knowledge, perception and skills to prevent and control COVID-19. A few people use surgical masks and frequent handwashing in their daily behaviors. Effective prevention and control measures are needed to protect the people living in rural areas of Thailand. Population migration, particularly young adults who work in large cities and who move back to their home village during the epidemic, should be strictly controlled. All relevant and essential knowledge related to the disease should be regularly released to the entire population of Thailand to improve their knowledge and perception of disease prevention and control. Moreover, skills and practices that are needed to prevent disease infection should be urgently deployed to the entire population of Thailand, particularly those living in rural areas.

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