

Intention to vaccinate against COVID-19 of Thai people in Trang Province, Thailand: A cross-sectional study

Siripannika Tengrang

Department of Science and Mathematics, Buranarumluk School, Trang, Thailand

Correspondence to: Siripannika Tengrang, E-mail: siripannika5190@gmail.com

Received: August 31, 2021; Accepted: December 09, 2021

ABSTRACT


Background: Coronavirus disease 2019 (COVID-19) is an epidemic that has greatly affected the daily life of people around the world. This epidemic, in addition to affecting lives, also affects other matters such as the economy or government administration that need to find ways to reduce the epidemic rate. That is to provide adequate quality vaccines for the people of the country. Finally, the government finds measures to stop the spread of COVID-19. **Objectives:** This study aimed to assess an acceptance to be vaccinated against COVID-19. **Materials and Methods:** Intention to be vaccinated against COVID-19 was measured with a question “When a vaccine for COVID-19 is ready for you, will you get vaccinated?” Response options were “yes,” “not sure” and “no.” Participants who responded “not sure” or “no” were asked to provide a reason. **Results:** A total of 400 responses were received. Overall, 38.5% ($n = 154$) of participants intended to get vaccinated, 29.5% ($n = 117$) were unsure, and 32.25% ($n = 129$) were not planning to get vaccinated. Factors that are independently related to vaccine hesitancy (“not sure” or “yes” response) include being male, risk perception of getting COVID-19, confidence in the government in handling the pandemic. **Conclusion:** A total of 400 participants, in the study, 38.5% ($n = 154$) of participants intended to get vaccinated, 29.5% ($n = 117$) were unsure, and 32.25% ($n = 129$) were not planning to get vaccinated. Male participants had a higher chance to refuse to vaccinate more than female 2.69 times. Predictive factors for COVID-19 vaccination were risk perception of contracting COVID-19 and lack of confidence in the government handling the pandemic of COVID-19.

KEY WORDS: Coronavirus Disease 2019; Vaccine; Vaccine Acceptance; Vaccine Hesitancy

INTRODUCTION

A number of cases of unexplained pneumonia were reported in Wuhan, China, in late December of 2019. Later, the cause of pneumonia was found to be caused by a new coronavirus strain.^[1] It is a large family of viruses that can cause diseases ranging from the common cold to deadly diseases such as Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome (SARS).^[2]

Coronavirus disease 2019 or COVID-19 is a widespread epidemic and affects many countries around the world. Thailand is one of the countries affected by the spread of COVID-19. At present, the number of daily infections continues to rise in the thousands, with more than ten daily deaths. In addition, various strains of coronavirus have been found in Thailand such as UK strain-B.1.1.7, Brazilian strain-P.1, South African strain-501Y.V2 or B.1.351 and Indian strain-B.1.617.1 and B.1.617.2.^[3] This situation has made people realize the importance of preventive measures, personal self-care, and vaccination. Vaccines are important in reducing the spread of the virus. However, vaccines need to be able to strengthen immunity that can protect most people from COVID-19. In other words, vaccines must be effective, safe, thorough and timely so that the vaccinated person is noninfectious and noncarrier. When most people are not

| Access this article online | |
|--|---|
| Website: http://www.ijmsph.com | Quick Response code |
| DOI: 10.5455/ijmsph.2021.08095202109122021 |  |

International Journal of Medical Science and Public Health Online 2021. © 2021 Siripannika Tengrang. This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

infected, their chances of spreading or contracting the virus are reduced, which prevents widespread outbreaks.

At present (as of May 28, 2021), the Food and Drug Administration has approved five vaccine companies, namely, Sinovac-CoronaVac vaccine, AstraZenecaAZD1222 vaccine, Johnson and Johnson-JNJ-78436735 vaccine, Moderna-mRNA-1273 vaccine and Sinopharm-BBIBP-CorV vaccine. Sinovac-CoronaVac vaccine and AstraZeneca-AZD1222 The vaccine is provided by the government and Johnson and Johnson-JNJ-78436735 vaccine, Moderna-mRNA-1273 vaccine and Sinopharm-BBIBP-CorV vaccine are an alternative vaccine that is provided by the private sector.^[4] Citizens can choose to receive vaccines in addition to government-provided vaccines, but at their own expense. The price of the vaccine is approximately 2,000 baht/dose, which includes hospital medical expenses, but does not include the doctor fee. The doctor fee depends on each hospital. Now Trang has only two vaccines available to people namely, Sinovac and AstraZeneca. I am interested in a study on vaccination attitudes of people in Trang to study the factors affecting vaccination attitudes.

MATERIALS AND METHODS

We adopted a cross-sectional online survey designed to evaluate Thai people living in Trang Province COVID-19 related knowledge, risk perception of getting COVID-19 and intention to be vaccinated against COVID-19. The survey was released to Thai people who lived in Trang province in Thailand. An invitation was sent to various local social media groups during 5 May-15 June 2021 with a total of 400 people responding. All participants completed surveys through Google form.

Instrument

The questionnaire was developed based on a literature review including:

1. Information provided by and a guideline from the health authorities (Ministry of Public Health Thailand, Center of Disease Control and World Health Organization) regarding COVID-19 and, Department of disease control.
2. Studies in other countries have already been conducted on the same subject with a number of common items used to evaluate each dimension analyzed in this study. The items then were grouped and redundant items removed.

A preliminary version of the instrument was reviewed by two experts and a researcher in the field to validate its content also showed that it was acceptable. A small sample of Trang people were asked to complete the test to check whether the level of language was suitable for them. All of the questions remained unchanged after this. As described under the

statistical analysis section, the psychometric characteristics of the questionnaire were also tested.

The final version of the questionnaire contained 34 questions, eleven on the participant's personal details including gender, age, status, education level, occupation, income, weight, resident, living arrangement, having congenital disease, having flu vaccine and the remaining 23 questions were divided into four sections.

The first section consisted of 15 questions on COVID-19 related knowledge such as modes of transmission, symptoms, prevention, and COVID-19 vaccine. The participants were asked to choose the correct answer out of four choices. One point was assigned to each correct answer, while an incorrect answer received zero points. Therefore, higher scores corresponded to a higher level of knowledge.

The second section was on risk perception of getting COVID-19. This section comprised of four questions, and the response categories consisted of a five-point Likert scale (1 for very low risk, 2 for low risk, 3 for neutral, 4 for high risk, and 5 for very high risk) with the highest score corresponding to the highest awareness of risk of getting COVID-19. Possible results were between 4 and 20 points.

The third section was on confidence in the government in handling the pandemic and in the public health care system. This section comprised of two questions, and the response categories consisted of a five-point Likert scale ([1] for very low confidence, [2] for low confidence, [3] for neutral, [4] for high confidence, and [5] for very high confidence) with the highest score corresponding to high level of confidence in the government in handling the pandemic and in the public health care system.

The last section was on willingness to be vaccinated. This section consisted of two questions, and the response categories consisted of yes, not sure and no. The last question was about the participant's opinion. Survey items are shown in Table 1.

Ethical Consideration

This research used an anonymous data collection method to collect data from people who lived in Trang province in Thailand. I used an online Google Form to collect data from people who belong to local social media groups. The invitation was sent to social media groups used by people who live in Trang province in Thailand. In these invitations, information about the study's objectives and the ethical guarantee of confidentiality and anonymity in the data collected as stated in the informed consent was explained. Participation was completely free and voluntary, and no personal data were collected from any participants.

Table 1: Differences in outcomes according to the sociodemographic characteristics of participants ($n=400$)

| Sociodemographic Characteristic | n (%) | Knowledge about COVID-19 (Range 0–15) | | Risk perception of getting COVID-19 (Range 4–20) | | Confidence in the government handling the pandemic of COVID-19 (Range 2–10) | |
|----------------------------------|------------|---------------------------------------|------|--|------|---|------|
| | | Mean | SD | Mean | SD | Mean | SD |
| Gender | | | | | | | |
| Male | 187 (46.8) | 13.04 | 2.58 | 10.67 | 3.22 | 2.01 | 1.00 |
| Female | 213 (53.3) | 11.93 | 2.71 | 10.93 | 3.80 | 1.97 | 1.02 |
| Age | | | | | | | |
| ≤18 | 102 (25.5) | 12.21 | 2.46 | 10.84 | 3.81 | 1.32 | 0.60 |
| 18–29 | 102 (25.5) | 12.41 | 2.99 | 10.35 | 3.63 | 1.68 | 0.88 |
| 30–49 | 107 (26.8) | 12.92 | 2.84 | 11.66 | 3.12 | 2.13 | 0.92 |
| Above 50 | 89 (22.3) | 12.21 | 2.44 | 10.27 | 3.45 | 2.85 | 0.99 |
| Marital status | | | | | | | |
| Single | 261 (65.3) | 12.61 | 2.56 | 10.81 | 3.62 | 1.69 | 0.87 |
| Married | 139 (34.8) | 12.15 | 2.94 | 10.81 | 3.39 | 2.50 | 1.07 |
| Education level | | | | | | | |
| High school | 153 (38.3) | 12.06 | 2.42 | 10.82 | 3.89 | 1.69 | 1.00 |
| Bachelor degree | 177 (44.3) | 12.92 | 2.31 | 10.43 | 3.38 | 2.11 | 1.00 |
| Master's degree and above | 70 (17.5) | 12.13 | 3.85 | 11.74 | 2.96 | 2.21 | 1.02 |
| Occupation | | | | | | | |
| Medical career | 27 (6.8) | 14.19 | 2.20 | 12.89 | 3.20 | 2.59 | 0.93 |
| Employee | 55 (13.8) | 12.42 | 3.16 | 11.13 | 3.15 | 2.15 | 0.85 |
| Teacher/others | 46 (11.5) | 12.90 | 2.96 | 10.65 | 2.83 | 2.26 | 1.10 |
| Freelance | 58 (14.5) | 12.03 | 2.48 | 10.29 | 3.46 | 2.57 | 1.09 |
| Student | 181 (45.3) | 12.22 | 2.71 | 10.59 | 3.81 | 1.47 | 0.77 |
| Others | 33 (8.3) | 12.48 | 1.60 | 10.94 | 3.50 | 2.45 | 1.03 |
| Income | | | | | | | |
| <20,000 | 193 (48.3) | 12.18 | 2.54 | 10.68 | 3.82 | 1.63 | 0.91 |
| 20,000–40,000 | 89 (22.3) | 13.00 | 2.59 | 11.03 | 3.13 | 2.13 | 1.00 |
| 40,000–80,000 | 89 (22.3) | 12.21 | 3.11 | 10.79 | 3.42 | 2.43 | 1.05 |
| 80,000 +++ | 29 (7.2) | 13.28 | 2.55 | 11.03 | 3.22 | 2.28 | 0.96 |
| Weight | | | | | | | |
| Under the criteria | 44 (11.0) | 11.91 | 3.12 | 10.02 | 3.55 | 1.86 | 1.03 |
| According to the criteria | 268 (67.0) | 12.76 | 2.53 | 10.93 | 3.43 | 1.94 | 0.99 |
| Above the criteria | 88 (22.0) | 11.78 | 2.88 | 10.83 | 3.85 | 2.10 | 1.09 |
| Resident | | | | | | | |
| Detached house | 271 (67.8) | 12.73 | 2.28 | 10.87 | 3.66 | 2.01 | 1.04 |
| Townhouse | 91 (22.8) | 11.90 | 3.01 | 10.67 | 3.42 | 2.03 | 0.98 |
| Condo/apartment | 38 (9.5) | 11.76 | 4.14 | 10.68 | 2.93 | 1.53 | 0.86 |
| Living arrangement | | | | | | | |
| Live alone | 51 (12.8) | 12.53 | 3.44 | 11.33 | 3.06 | 1.96 | 1.06 |
| Without children and/or senior | 211 (52.8) | 12.32 | 2.67 | 11.03 | 3.49 | 2.03 | 1.03 |
| With children and/or senior | 138 (34.5) | 12.62 | 2.45 | 10.28 | 3.74 | 1.88 | 1.00 |
| Having Congenital Disease | | | | | | | |
| No | 293 (73.3) | 12.56 | 2.76 | 10.71 | 3.58 | 1.82 | 0.96 |
| Yes | 107 (26.8) | 12.14 | 2.54 | 11.07 | 3.43 | 2.37 | 1.07 |

(Contd...)

Table 1: (Continued)

| Sociodemographic Characteristic | n (%) | Knowledge about COVID-19 (Range 0–15) | | Risk perception of getting COVID-19 (Range 4–20) | | Confidence in the government handling the pandemic of COVID-19 (Range 2–10) | |
|---------------------------------|------------|---------------------------------------|------|--|------|---|------|
| | | Mean | SD | Mean | SD | Mean | SD |
| Having flu vaccine | | | | | | | |
| No | 78 (19.5) | 11.12 | 2.88 | 11.06 | 3.97 | 2.19 | 1.16 |
| Yes | 322 (80.5) | 12.77 | 2.56 | 10.75 | 3.43 | 1.92 | 1.00 |
| Total | 400 (100) | 12.45 | 2.71 | 10.81 | 3.54 | 1.97 | 1.02 |

Statistical Analysis

Participant characteristics were summarized using frequencies and percentages. We used crosstabulation and chi-square tests to estimate unadjusted associations of participant characteristics with the 3-category outcome intention to get vaccinated [Table 2]. To better distinguish characteristics associated with responses of “not sure” versus “yes” and of “no” versus “yes,” we also calculated separate chi-square tests and associated P values. Pearson’s Correlation was used to test association among scale variables.

To estimate corresponding adjusted (multivariate) associations, multinomial logistic regression was used to compare each of two or more non-ordered outcome categories to the reference category. In particular, we modelled both natural log (Preference [Yes]/Preference [Not sure]) and natural log (Preference [Yes]/Preference [No]) as a function of participant characteristics. This approach allows different associations with covariates for the two comparisons while providing overall P values for covariates. Whereas, coefficients from a binomial logistic regression model are typically exponentiated to obtain odd ratios, exponentiated coefficients from a multinomial logistic regression model are interpreted as odd ratios. An illustrative calculation is provided in Table 3.

Characteristics that were not statistically significant ($P < 0.05$) in the multivariate multinomial modelling were omitted in the final model. These characteristics were found to be correlated with predictors retained in the final model (for example, the type of house participant lives in.).

Thematic analysis to inductively produce categories and distinguish topics within the responses was applied with an open-ended inquiry requesting for reasons for vaccine hesitancy. A categorizing framework was made on the basis of initial review of all responses. The reasons for vaccine hesitancy were summarized in Table 4.

RESULTS

This study comprised a total of 400 participants that answered the questionnaires. The sociodemographic characteristic of the

sample was presented in Table 1. Most participants were female ($n = 213, 53.3\%$). Most participants age’s were 30–49 ($n = 107, 26.8\%$) followed by under 18 years of age group ($n = 102, 25.5\%$) and 18–29 years of age group ($n = 102, 25.5\%$), respectively. Most of the participants were single ($n = 261, 65.3\%$). 177 (44.3%) of the participants graduated with a bachelor’s degree. Most participants were students (181, 45.3%). Most participants earned monthly income below 20,000 Baht ($n = 193, 48.3\%$). The weight of most participants was according to the criteria ($n = 268, 67.0\%$). Most participants lived in detached houses ($n = 271, 67.8\%$), which lived with families without children or seniors ($n = 211, 52.8\%$). Finally, most of the participants didn’t have congenital disease ($n = 293, 73.3\%$) and used to inject flu vaccine ($n = 322, 80.5\%$).

Regarding knowledge about COVID-19, participants revealed good knowledge about COVID-19, correctly answering the mean of 12.45 (standard deviation [SD] = 2.71) questions out of a total of 15. Male participants showed a higher knowledge score (Mean [M] = 13.04, SD = 2.58) than female participants (M = 11.93, SD = 2.71). The age group of 30–49 years showed the highest COVID19 related knowledge mean score of 12.92 (SD = 2.84), followed by the age group of 18–29 years (M = 12.41, SD = 2.99). The participants that were single got the score (M = 12.61, SD = 2.56) higher than participants in marital status (M = 12.15, SD = 2.94). Participants who attained a bachelor’s degree got the highest COVID-19 related knowledge mean score of 12.92 (SD = 2.31). Then, in the group of careers, the medical career showed the highest COVID-19 related knowledge mean score of 14.19 (SD = 2.20). For the income group, participants who earned a monthly income of more than 80,000 baht had the highest COVID-19 related knowledge score of 13.28 (SD = 2.55). Participants who had the weight were according to the criteria that got the highest COVID-19 related knowledge mean score of 12.76 (SD = 2.53). Participants who lived in detached houses and lived with a family that had children or seniors got the highest COVID-19 related knowledge mean score of 12.73 (SD = 2.28) and 12.62 (SD = 2.45), respectively. Furthermore, Participants who didn’t have the congenital disease and used to inject the flu vaccine had the highest COVID-19 related knowledge mean score of 12.56 (SD = 2.76) and 12.77 (SD = 2.56) sequentially.

Table 2: Intention to vaccinate by participant characteristic

| Sociodemographic characteristic | n (%) | Willingness to be vaccinated against COVID-19 | | | P-value |
|---------------------------------|------------|---|--------------------------|--------------------|---------|
| | | Yes (n=154, 38.5%) | Not sure (n=117, 29.25%) | No (n=129, 32.25%) | |
| Gender | | | | | 0.276 |
| Male | 187 (46.8) | 73 (39.04) | 48 (25.67) | 66 (35.29) | |
| Female | 213 (53.3) | 81 (38.03) | 69 (32.39) | 63 (29.58) | |
| Age | | | | | 0.000 |
| ≤18 | 102 (25.5) | 14 (13.73) | 38 (37.25) | 50 (49.02) | |
| 18–29 | 102 (25.5) | 23 (22.55) | 37 (36.27) | 42 (41.18) | |
| 30–49 | 107 (26.8) | 57 (53.27) | 26 (24.30) | 24 (22.43) | |
| Above 50 | 89 (22.3) | 60 (67.41) | 16 (17.98) | 13 (14.61) | |
| Marital status | | | | | 0.000 |
| Single | 261 (65.3) | 69 (26.44) | 94 (36.02) | 98 (37.54) | |
| Married | 139 (34.8) | 85 (61.15) | 23 (16.55) | 31 (22.30) | |
| Education level | | | | | 0.000 |
| High school | 153 (38.3) | 38 (24.84) | 52 (33.99) | 63 (41.18) | |
| Bachelor degree | 177 (44.3) | 76 (42.94) | 52 (29.38) | 49 (27.68) | |
| Master's degree and above | 70 (17.5) | 40 (57.14) | 13 (18.57) | 17 (24.29) | |
| Occupation | | | | | 0.000 |
| Medical career | 27 (6.8) | 23 (85.19) | 3 (11.11) | 1 (3.70) | |
| Employee | 55 (13.8) | 27 (49.10) | 17 (30.90) | 11 (20) | |
| Teacher/others | 46 (11.5) | 18 (39.14) | 14 (30.43) | 14 (30.43) | |
| Freelance | 58 (14.5) | 36 (62.07) | 9 (15.52) | 13 (22.41) | |
| Student | 181 (45.3) | 29 (16.02) | 66 (36.46) | 86 (47.52) | |
| Others | 33 (8.3) | 21 (63.64) | 8 (24.24) | 4 (12.12) | |
| Income | | | | | 0.000 |
| <20,000 | 193 (48.3) | 40 (20.73) | 74 (38.34) | 79 (40.93) | |
| 20,000–40,000 | 89 (22.3) | 41 (46.07) | 22 (24.72) | 26 (29.21) | |
| 40,000–80,000 | 89 (22.3) | 54 (60.67) | 14 (15.73) | 21 (23.60) | |
| 80,000 +++ | 29 (7.2) | 19 (65.52) | 7 (24.14) | 3 (10.34) | |
| Weight | | | | | 0.300 |
| Under the criteria | 44 (11.0) | 17 (38.64) | 9 (20.45) | 18 (40.91) | |
| According to the criteria | 268 (67.0) | 98 (36.57) | 81 (30.22) | 89 (33.21) | |
| Above the criteria | 88 (22.0) | 39 (44.32) | 27 (30.68) | 22 (25) | |
| Resident | | | | | 0.090 |
| Detached house | 271 (67.8) | 112 (41.33) | 78 (28.78) | 81 (29.89) | |
| Townhouse | 91 (22.8) | 35 (38.46) | 24 (26.37) | 32 (35.17) | |
| Condo/apartment | 38 (9.5) | 7 (18.42) | 15 (39.47) | 16 (42.11) | |
| Living arrangement | | | | | 0.169 |
| Live alone | 51 (12.8) | 18 (35.29) | 18 (35.29) | 15 (29.42) | |
| Without children and/or senior | 211 (52.8) | 88 (41.71) | 64 (30.33) | 59 (27.96) | |
| With children and/or senior | 138 (34.5) | 48 (34.78) | 35 (25.36) | 55 (39.86) | |
| Having congenital disease | | | | | 0.000 |
| No | 293 (73.3) | 96 (32.76) | 90 (30.72) | 107 (36.52) | |
| Yes | 107 (26.8) | 58 (54.21) | 27 (25.23) | 22 (20.56) | |
| Having influenza vaccine | | | | | 0.015 |
| No | 78 (19.5) | 41 (52.56) | 16 (20.51) | 21 (26.93) | |
| Yes | 322 (80.5) | 113 (35.09) | 101 (31.37) | 108 (33.54) | |
| Total | 400 (100) | 154 (38.5) | 117 (29.25) | 129 (32.25) | |

COVID-19: Coronavirus disease 2019

Table 3: Multivariate Predictors of Responding “Yes” versus. “No” or “Not sure” Regarding Intent to be vaccinated, according to the multinomial model

| Sociodemographic characteristic | Willingness to be vaccinated No versus Yes | | | Willingness to be vaccinated not sure versus yes | | |
|---------------------------------|--|--------|----------------|--|-------|--------------|
| | P | OR | 95% CI | P | OR | 95% CI |
| Gender | | | | | | |
| Male | 0.003 | 2.698 | 1.391–5.234 | 0.518 | 1.232 | 0.654–2.321 |
| Female | Reference | | | Reference | | |
| Age | | | | | | |
| ≤18 | 0.252 | 2.812 | 0.479–16.495 | 0.715 | 1.380 | 0.246–7.747 |
| 18–29 | 0.563 | 1.520 | 0.368–6.283 | 0.971 | 1.027 | 0.247–4.271 |
| 30–49 | 0.552 | 1.356 | 0.497–3.703.63 | 0.811 | 1.120 | 0.442–2.835 |
| Above 50 | Reference | | | Reference | | |
| Marital status | | | | | | |
| Single | 0.320 | 0.630 | 0.254–1.565 | 0.070 | 2.193 | 0.938–5.128 |
| Married | Reference | | | Reference | | |
| Education level | | | | | | |
| High School | 0.777 | 0.817 | 0.201–3.317 | 0.760 | 0.805 | 0.200–3.237 |
| Bachelor Degree | 0.997 | 1.002 | 0.383–2.624 | 0.479 | 1.410 | 0.545–3.651 |
| Master’s degree and above | Reference | | | Reference | | |
| Occupation | | | | | | |
| Medical career | 0.219 | 0.211 | 0.018–2.524 | 0.126 | 0.271 | 0.051–1.442 |
| Employee | 0.817 | 0.838 | 0.187–3.759 | 0.980 | 1.016 | 0.289–3.570 |
| Teacher/others | 0.133 | 3.098 | 0.709–13.533 | 0.533 | 1.492 | 0.424–5.256 |
| Freelance | 0.663 | 1.374 | 0.329–5.741 | 0.419 | 0.601 | 0.175–2.064 |
| Student | 0.066 | 6.347 | 0.888–45.352 | 0.857 | 0.854 | 0.153–4.777 |
| Others | Reference | | | Reference | | |
| Income | 0.597 | 1.656 | 0.255–10.747 | | | |
| <20,000 | 0.275 | 2.423 | 0.495–11.867 | 0.118 | 3.259 | 0.740–14.347 |
| 20,000–40,000 | 0.337 | 2.096 | 0.462–9.505 | 0.906 | 0.926 | 0.258–3.327 |
| 40,000–80,000 | | | | 0.607 | 0.725 | 0.213–2.469 |
| 80,000 +++ | Reference | | | Reference | | |
| Weight | | | | | | |
| Under the criteria | 0.714 | 1.228 | 0.410–3.677 | 0.092 | 0.362 | 0.111–1.180 |
| According to the criteria | 0.403 | 1.387 | 0.644–2.987 | 0.482 | 0.775 | 0.382–1.576 |
| Above the criteria | Reference | | | Reference | | |
| Resident | | | | | | |
| Detached house | 0.167 | 0.321 | 0.064–1.606 | 0.272 | 0.413 | 0.085–2.003 |
| Townhouse | 0.496 | 0.563 | 0.108–2.936 | 0.596 | 0.648 | 0.131–3.216 |
| Condo/apartment | Reference | | | Reference | | |
| Living arrangement | | | | | | |
| Live alone | 0.514 | 0.613 | 0.141–2.670 | 0.663 | 1.353 | 0.348–5.270 |
| Without children and/or senior | 0.900 | 0.957 | 0.486–1.888 | 0.064 | 1.928 | 0.963–3.860 |
| With children and/or senior | Reference | | | Reference | | |
| Having congenital disease | | | | | | |
| No | 0.359 | 0.1436 | 0.663–3.113 | 1.062 | 0.505 | 2.233 |
| Yes | Reference | | | Reference | | |
| Having influenza vaccine | | | | | | |
| No | 0.224 | 0.617 | 0.283–1.343 | 0.128 | 0.536 | 0.240–1.196 |
| Yes | Reference | | | Reference | | |
| Knowledge about COVID-19 | 0.988 | 1.001 | 0.875–1.145 | 0.226 | 1.090 | 0.948–1.253 |

(Contd...)

Table 3: (Continued)

| Sociodemographic characteristic | Willingness to be vaccinated No versus Yes | | | Willingness to be vaccinated not sure versus yes | | |
|--|--|-------|-------------|--|-------|-------------|
| | P | OR | 95% CI | P | OR | 95% CI |
| Risk perception of contracting COVID 19 | 0.002 | 0.868 | 0.793–0.949 | 0.453 | 0.968 | 0.889–1.054 |
| Confidence in the government handling pandemic of COVID-19 | 0.004 | 0.570 | 0.386–0.840 | 0.016 | 0.625 | 0.427–0.915 |

COVID-19: Coronavirus disease 2019, OR: Odds Radio

Table 4: Reasons for vaccine hesitancy

| Reasons | Not sure (%) | No | Total |
|---|--------------|-------------|-------------|
| Don't feel risk contracting COVID-19 | 3 (75) | 1 (25) | 4 (1.63) |
| Concern over unforeseen side effects | 63 (47.01) | 71 (52.99) | 134 (54.47) |
| No Confidence in the government handling pandemic of COVID-19 | 43 (47.25) | 48 (52.75) | 91 (36.99) |
| Personal reasons | 10 (58.82) | 7 (41.18) | 17 (6.91) |
| Total | 119 (48.37) | 127 (51.63) | 246 (100) |

COVID-19: Coronavirus disease 2019

Participants showed a moderate level of risk perception of getting COVID-19 with an average score of 10.81 from 20.00 full scores. Females showed a higher level of risk perception of getting COVID-19 ($M = 10.93$, $SD = 3.80$) than male participants ($M = 10.67$, $SD = 3.22$). The age group of 30–49 years showed the highest level of risk perception of getting COVID-19 score of 11.66 ($SD = 3.12$). The participants that were single got the level ($M = 10.81$, $SD = 3.62$) the same as participants in marital status ($M = 10.81$, $SD = 3.39$). Participants who obtained a master's degree and above got the highest level of risk perception of getting COVID-19 of 11.74 ($SD = 2.96$). In the group of careers, the medical career showed the highest level of risk perception of getting COVID-19 of 12.89 ($SD = 3.20$). For the income group, not only participants who earned a monthly income between 20,000 and 40,000 Baht ($M = 11.03$, $SD = 3.13$), but also participants who earned a monthly income above 80,000 Baht ($M = 11.03$, $SD = 3.22$) got the highest level of risk perception of getting COVID-19. The weight of participants that got the highest level of risk perception of getting COVID-19 of 10.93 ($SD = 3.43$) was according to the criteria. Participants who lived in detached houses and lived alone got the highest level of risk perception of getting COVID-19 of 10.87 ($SD = 3.66$) and 11.33 ($SD = 3.06$) sequentially. In the end, Participants who had congenital disease and did not use the flu vaccine had the highest level of risk perception of getting COVID-19 of 11.07 ($SD = 3.43$) and 11.06 ($SD = 3.97$), respectively.

Concerning confidence in the government handling the pandemic of COVID-19, participants had low confidence in the government handling the pandemic of COVID-19, with an average score of 1.97 ($SD = 1.02$). Male participants showed a higher confidence in the government handling the pandemic of COVID-19 ($M = 2.01$, $SD = 1.00$) than male participants ($M = 1.97$, $SD = 1.02$). The age

group above 50 years showed the highest confidence in the government handling the pandemic of COVID-19 ($M = 2.85$, $SD = 0.99$). The participants that were in marital status ($M = 2.50$, $SD = 1.07$) had higher confidence in the government handling the pandemic of COVID-19 than participants who were single ($M = 1.69$, $SD = 0.87$). Participants who obtained a master's degree and above got the highest confidence in the government handling the pandemic of COVID-19 ($M = 2.21$, $SD = 1.02$). In the group of careers, medical career showed the highest confidence in the government handling the pandemic of COVID-19 ($M = 2.59$, $SD = 0.93$). For the income group, participants who earned a monthly income between 40,000–80,000 Baht ($M = 2.43$, $SD = 1.05$) had the highest confidence in the government handling the pandemic of COVID-19. The weight of participants that were above the criteria had the highest confidence in the government handling the pandemic of COVID-19 ($M = 2.10$, $SD = 1.09$). Participants who lived in townhouse ($M = 2.03$, $SD = 0.98$), lived with a family that had not children and/or seniors ($M = 2.03$, $SD = 1.03$), have the congenital disease ($M = 2.37$, $SD = 1.07$), and did not use to inject the flu vaccine ($M = 2.19$, $SD = 1.16$) had the highest confidence in the government handling the pandemic of COVID-19.

Overall, 38.5 % ($n = 154$) of the participants intended to be vaccinated against COVID-19, 29.25% ($n = 117$) were not sure whether they would be vaccinated, and 32.25% ($n = 129$) did not intend to be vaccinated. The combined data among those who hesitated and refused vaccines was 61.5% of all participants ($n = 246$). Factors associated with intention to vaccinate were age, marital status, education level, occupation, income, and having congenital disease.

COVID-19 vaccine acceptance rate of male participants was 39.04% ($n = 73$) while female participants was 38.03%

($n = 81$). Participants who had an influenza vaccine before had the highest COVID-19 vaccine acceptance rate at 35.09%, ($n = 113$). Participants who lived in an apartment or condominium had the lowest acceptance rate COVID-19 vaccine acceptance rate at 18.42%, ($n = 7$).

Factors that were independently associated with vaccine acceptance (response of “no” or “yes”) included being male (odds ratio [OR] = 2.698, [95% IC, 1.391–5.234]). Consequently, male participants were 2.698 times more likely to say “no” than female participants.

Risk perception of getting COVID-19 (Exp $\beta = 0.87$, $P < 0.01$), the level of confidence in government handling the pandemic of COVID-19 (Exp $\beta = 0.57$, $P < 0.01$), was predictive factors for chances of saying “no” than “yes” at 86.8% and 57%, respectively, which were statistically significant. Risk perception of contracting COVID-19 (Exp $\beta = 0.868$, $P < 0.01$) and confidence in the government in handling the pandemic (Exp $\beta = 0.57$, $P < 0.01$) were predictive factor of saying “no” versus “yes” at 86.8% and 57%, respectively.

DISCUSSION

According to a study of willingness to get vaccinated against COVID-19 with 400 participants, 61.50% ($n = 246$) of the participants hesitated and didn't want to be vaccinated against COVID-19. Only 38.5% ($n = 154$) wanted to get vaccinated against COVID-19. Male participants had a higher chance to refuse COVID-19 vaccination 2.698 times higher than female participants this may be because most participants who had congenital disease were male. Moreover, Trang province is located in the southern part of Thailand where population density was much lower than in Bangkok and being under COVID-19 measures that most people work from home,^[5] and the number of COVID-19 infected cases^[6] during the study period was not as high as in Bangkok subsequently most participants did not feel the risk of contracting COVID-19. Common reasons for vaccine refusal or hesitancy were concern over side effects for both short-term and long-term which accounted for 54.47% ($n = 134$), followed by lack of confidence in the government (36.99%, $n = 91$). Risk perception of contracting COVID-19 (Exp $\beta = 0.868$, $P < 0.01$) and confidence in the government in handling the pandemic (Exp $\beta = 0.57$, $P < 0.01$) were predictive factor of saying “no” versus “yes” at 86.8% and 57%, respectively.

This may be because of in Trang province, during the data collection period, number of COVID-19 infected cases on the average was 22^[7] compared to number of infected cases on the average 945 cases daily and in Bangkok,^[6] so people in the area didn't feel very risk that seeking to vaccinate against COVID-19. Most people were dissatisfied with the administration of the government. There have been several

protests since before COVID-19; there have been 2–3 waves of repeated outbreaks caused by deficiencies in the work of government officials,^[8] together with COVID-19 vaccine policy, to provide main vaccine for only Sinovac and AstraZeneca^[9] information as of 5 May–15 June 2021. Choices of vaccine and efficacy affect willingness to get vaccinated in Indonesia where perception of vaccine effectiveness greatly influences willingness to be vaccinated; this is shown in the study by Harapan *et al.*^[10] Vaccine efforts may need to go beyond just communications campaigns correcting misinformation about a COVID-19 vaccine to also focus on reestablishing public trust in government agencies, this shown study by Guidry *et al.*^[11]

A Belgium-based study showed that 34% ($n = 651$) of participants reported to definitely getting vaccinated against COVID-19, and 39% of them ($n = 742$) said they would “probably” be vaccinated. Vaccine hesitation or refusals were primarily based on the effectiveness and safety, both short- and long-term of COVID-19 vaccines, as well as the attitudes and beliefs about vaccines and public trust.^[12] Independent factors associated with vaccine hesitation were young age, single, low educational attainment, low income groups consistent with Fisher *et al.*^[13] studied attitudes toward a potential SARS-CoV-2 vaccine. A study conducted during 16–20 April 2020 of American adults found that the acceptance rate of COVID-19 vaccines was approximately 40%. The most significant predictor for vaccine hesitancy was being young, black with less than a college degree. The principal reasons for vaccine hesitation include the lack of information on vaccinations, anti-vaccine attitudes, beliefs, emotions, and the lack of trust in the government, Centers for Disease Control, pharmaceutical companies and the development processes of vaccines.

Limitation

When the research took place during the third COVID-19 wave in Thailand, from May to June 2021, COVID-19 vaccination rollout began for the 18–60 age groups which excluded the majority of the participants in this study (aged 30–49). Moreover, the Google form survey was limited to participants with access to the internet.

CONCLUSION

A total of 400 participants in the study, 38.5% ($n = 154$) of participants intended to get vaccinated, 29.5% ($n = 117$) were unsure, and 32.25% ($n = 129$) were not planning to get vaccinated. Male participants had a higher chance to refuse to vaccinate more than female 2.69 times. Predictive factors for COVID-19 vaccination were risk perception of contracting COVID-19 and lack of confidence in the government handling the pandemic of COVID-19.

REFERENCES

1. World Health Organization. Novel Coronavirus (2019-nCoV) Situation Report-1. Geneva: World Health Organization; 2020. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep1-2019-ncov.pdf?sfvrsn=20a99c10_4 [Last accessed on 2021 May 05].
2. World Health Organization. Coronavirus. Geneva: World Health Organization; 2021. Available from: <https://www.who.int/westernpacific/health-topics/detail/coronavirus> [Last accessed on 2021 May 05].
3. Kapook. COVID Strains in Thailand, How Fierce Will the Virus Be? Which Vaccine Can Fight? 2021. Available from: <https://www.covid-19.kapook.com/view241927.html> [Last accessed on 2021 May 05].
4. Praram 9 Hospital. Alternative Vaccine for COVID 19. If You Have to Choose, You Need to Know What's There; 2021. Available from: <https://www.praram9.com/alternative-covid19-vaccine/#q3> [Last accessed on 2021 May 07].
5. The Teachers' Council of Thailand. The Teachers' Council of Thailand Organized 90 % of Personnel Who Were Working from Home Until 1-31 May 2021; 2021. Available from: <https://www.ksp.or.th/ksp2018/2021/04/29978> [Last accessed on 2021 May 05].
6. BMA DATA Center. Daily Situation; 2021. Available from: <http://www.prbangkok.com/th/covid-today> [Last accessed on 2021 Jun 18].
7. Trang Provincial Office. Situational Information; 2021. Available from: <http://www.covidtr.trang.go.th/news/detail/151> [Last accessed on 2021 Jun 18].
8. Thai Post. People are Like Being Poured! Dr. Athit Said the Government for Failing to Provide, Manage the COVID-19 Vaccine Completely; 2021. Available from: <https://www.thaipost.net/main/detail/104761> [Last accessed on 2021 Jun 01].
9. BBC NEWS Thailand. COVID-19: Government Plans to Provide Vaccines, Which Ones, When They Come, and Who Gets Them Injected First? 2021. Available from: <https://www.bbc.com/thai/thailand-57243640> [Last accessed on 2021 Jun 01].
10. Harapan H, Wagner AL, Yufika A, Winardi W, Anwar S, Gan AK, *et al.* Acceptance of a COVID-19 vaccine in Southeast Asia: A cross-sectional study in Indonesia. *Front Public Health* 2020;8:381.
11. Guidry JP, Laestadius LI, Vraga EK, Miller CA, Perrin PB, Burton CW, *et al.* Willingness to get the COVID-19 vaccine with and without emergency use authorization. *Am J Infect Control* 2021;49:137-42.
12. Kessels R, Luyten J, Tubeuf S. Willingness to get vaccinated against COVID 19: Profiles and attitudes towards vaccination. In: Louvain Institute of Data Analysis and Modeling in economics and statistics. Available from: <https://www.sites.uclouvain.be/econ/dp/ires/2020035.pdf> [Last accessed on 2021 Jun 20].
13. Fisher KA, Bloomstone SJ, Walder J, Crawford S, Fouayzi H, Mazor KM. Attitudes toward a potential SARS-CoV-2 vaccine: A survey of U.S. adults. *Ann Intern Med* 2020;173:964-73.

How to cite this article: Tengrang S. Intention to vaccinate against COVID-19 of Thai people in Trang Province, Thailand: A cross-sectional study. *Int J Med Sci Public Health* 2021;10(2):269-277.

Source of Support: Nil, **Conflicts of Interest:** None declared.