



## Willingness to vaccinate against COVID-19 of Adolescent in Thailand: A cross sectional study

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### Abstract

**Background:** COVID-19 or Coronavirus disease 2019 has affected all aspects of life globally and become a major threat to public health around the world. One of the most important actions that need to be taken to stop the pandemic is vaccinations. Managing the COVID-19 pandemic in the long-term, willingness to vaccinate and attitudes towards vaccines.

**Objectives:** This study aimed to investigate undergraduate students' knowledge, risk perceptions and attitudes towards COVID-19 vaccinations among students in Banpakok Wittayakom School, Thailand.

**Materials and Methods:** The study was conducted using a questionnaire. A total of 334 students participated. COVID-19 related knowledge, risk perception, and attitude toward COVID-19 vaccines were assessed. Statistical test using SPSS statistics to analyze differences between intention to be vaccinated and sociodemographic was done using exact p value, Pearson's chi-square test, and Binary Logistic Regression.

**Results:** Students revealed a moderate level of COVID-19 related knowledge. a moderate level of risk perception of getting COVID-19 has the highest number of students who do not want to get vaccinated (n=223, 66.77%). Intention to get vaccinated was 33.23% (n= 111). The analysis of a binary logistic regression indicated that the Knowledge about COVID-19 of students had a statistically significant effect on the intention to get vaccinated. Knowledge predicted the deposition of intention to get vaccinated of students (Exp (B) = .787, p <0.001)

**Conclusion:** This study revealed a moderate level of knowledge about COVID-19, and low risk perception of getting COVID-19 among students at Bangkok Wittayakom School, Thailand. There is no relationship between gender, Year level, Occupation of parent, Confidence in the government in handling the pandemic, and Risk Perception of contracting COVID-19. Most students had no intention to be vaccinated against COVID-19 due to concerns on side effects and efficacy of the current availability of COVID-19 vaccine in Thailand. Therefore, to increase more acceptance of COVID-19 vaccination among students, more choices of COVID-19 vaccine with high efficacy should be provided.

**Keywords:** COVID-19 Vaccine, Vaccine acceptance, Vaccine hesitancy, high school students

### INTRODUCTION

COVID-19 is a virus discovered in December 2019 in Wuhan, China that causes respiratory disease. It is thought to have evolved from the coronavirus found in 1960. Most infected people have respiratory problems. Patients with underlying disease are more likely to develop severe symptoms, with COVID-19 spread by airborne droplets. including secretions from people

infected with COVID-19. The coronavirus is a large family of viruses that can infect many people and animals [1]. On February 11, 2020, the World Health Organization (WHO) officially named COVID-19, CO is Corona, VI is Virus and D is Disease, while 19 is from the year of discovery 2019 [2]. The symptoms may appear during 2-14 days after infection with the

initial symptoms being fever or chills, cough, trouble breathing, body aches, headache, loss of new taste or smell, sore throat, stuffy or runny nose, nausea or vomiting, diarrhea, in mild cases [3]. The first patient treated in Thailand on January 13, 2020 is a Chinese man who contracted the outbreak in China. and traveled to Thailand. After that, many more patients came from other countries. The first infected patient in Thailand was reported on January 31, 2020 [4]. The process from infection to illness includes exposure to germs, exposure, infection, and illness. We can use vaccines to help prevent infection. Vaccine will stimulate

T Lymphocytes to recognize the Virus and for B Lymphocytes to eliminate Virus those who come in close contact with the infected person or may come in contact with the virus that came out with the virus. secretions from the patient's respiratory system then may be imported into organs with mucous membranes. However, when you live in a community where people are infected COVID-19 and you are not careful enough. You may have an infection and can be a source of spread of infection [5]. The population immunization rate across the country should increase from 70 percent to 80-85% if more vaccinations are available for children under 18. Vaccination in the world has been injected 12.1% of the world's population, with Thailand already injecting 15.34% of the total population, but will not include people from 12-18 years old because there is no vaccine suitable for this age group in Thailand [6]. In Colombia, 43.06% of the population has been vaccinated. This reduced the number of infections in Colombia by 23%, with Colombia using Pfizer in children and using Astrazeneca, Moderna, Johnson & Johnson in the population in Colombia [7].

In the outbreak between April 1, 2021 and July 30, 2021, there were 13,849 (56.98%) cases of Alpha, 9,970 (41.01%) cases of Delta and 484 (1.99%) cases of Beta. Total of 24,303 cases were reported in the Bangkok area. Therefore, the Delta is considered an epidemic quickly and should be immunized as soon as possible [8]. In Thailand, Sinovac Astrazeneca and Sinopharm are vaccinated. In terms of vaccine prevention. Astrazeneca has efficacy at preventing disease 53%, 40% for Sinovac and 47% for Sinopharm and has a vaccine that is registered with the FDA, Johnson & Johnson has efficacy at preventing disease

64%, 81% for Pfizer and alternative vaccines is Moderna has efficacy at preventing disease 83% to preventing Delta [9]. In Thailand, there have been calls from associates of public health personnel and groups of doctors to start campaigning. The list of supporters of the group's claim for the importation of mRNA vaccine in just two days has signed a petition through Google forms and website Change.org has more than 200,000 names, with the group describing the source of the campaign as a list of names. Because the situation with the infection of COVID-19 is severe and may worsen from the outbreak of the delta species spread more rapidly than other species. The proposal is to import the mRNA vaccine as quickly as possible and use it as a mainstream vaccine to prevent outbreaks.

The procedure must be disclosed to the public [10].

This research aimed to study willingness to be vaccinated against COVID-19 vaccine high school students, grade 10-12 in Bangkok, Thailand. The researcher selected Bangpakok Wittayakom School because this school is located in one of the highest infection areas in Bangkok.

## Methods

### Participants and procedure

This was a cross-sectional observational study using an online questionnaire which was purposely developed and made available through Google Forms between 22nd July to 30th July 2021. COVID-19 knowledge, risk perception of contracting COVID-19, Confidence in the government in handling the pandemic, Intent to be vaccinated and Reasons for COVID-19 Vaccine Hesitancy. Grade 10-12 students enrolled in the Bangpakok Wittayakom, Bangkok, Thailand. Grade 10-12 were eligible and were invited to participate in the study. The invitation was sent to the school's social media groups. A total of 334 students participated in this study. Information about the objectives of the study as well as the confidentiality and anonymity in the data collected as stated in the informed consent were explained. Participation was voluntary and no personal data were collected from any participant.

The questionnaire was developed based on a literature review including

(1) Covid-19 vaccine information from World Health Organization, Centers for Disease Control and Prevention, and Australian Government department of Health.

(2) Studies already performed on the same topic in other countries where several common items were used to assess each of the dimensions analyzed in this study.

A preliminary version of the instrument was reviewed by three infection control specialists of public hospitals in Thailand to validate its content.

A pretest was then performed with a small sample of higher education students to test for comprehension and difficulty. All the questions remained without modifications. The psychometric characteristics of the questionnaires were tested, as described in the statistical analysis subsection. The final version of the questionnaire contained questions; first three questions about socio demographic data (year level, gender, level and parent's occupations) and 19 items divided into three sections.

The first section related to the knowledge of basic information about COVID-19 and information about COVID-19 vaccine. The participants were asked to choose only one correct answer from for choices (1, 2, 3 and 4). One point was assigned to each correct answer, while providing an incorrect answer received 0 points. The sum of all items was made hence higher scores corresponded to a higher level of knowledge. The score varies from 0 to 15, with greater than or equal to 12 as a good level, greater than 8 but less than 12 as a moderate level and less than 7 as a poor level.

**Risk Perception of Getting COVID-19:** This scale refers to the number of risk perceptions of getting COVID-19. Each item was answered using a five-point scale (From 1-Less to 5-More), A higher score on this scale indicated who are getting COVID-19, ranging from

1 to 5.

**Confidence in the government in handling the pandemic:** This scale refers to the number of confidence in the government. Each item was answered using a five-point scale

(From 1-Less to 5-More), A higher score on this scale illustrated confidence in the government.

**Acceptance to vaccinate against COVID-19:** Participants were asked if the COVID-19 vaccines are available, would you get vaccinated or not? The answer was yes or no question. **Reasons for COVID-19 Vaccine Hesitancy:** The participants were asked to provide a reason by choosing only one choice of reasons 1. Concerned on unforeseen (both short term and long term) side effects; 2. Preferred more choices of vaccine than what being provided by the government; 3. Personal reasons such as not convenient to travel to get vaccinated and 4. Don't feel risk getting COVID-19.

## Statistic

This study collected statistical data and analyzed it using SPSS statistics. Participant characteristics were summarized by using frequencies and percentages. We used cross tabulations and chi-square tests to estimate associations of participants. Statistical test was done using exact p value, Pearson's chi-square test, and Binary Logistic Regression.

## Ethical Consideration

This research uses an anonymous data collection method to collect data from 334 students in Bangpakok Wittayakom School by Google form. The invitation was sent through a social media platform used by the students. 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 participant.

## Result

This study comprised a total of 334 students. The Sociodemographic characteristics of the sample are presented in Table 1 Most students were grade 12 (n=112, 33.5%) and 11 (n=112, 33.5%) followed by grade 10 (n=110, 32.9%). Most students were female (n=189, 56.6%). Most occupation of parent were Agriculturist / Fisherman / Business owner (n=130, 38.9%) followed by Office worker (n=92, 27.5%)

Regarding knowledge about COVID-19, students revealed good knowledge about COVID-19, correctly answering a mean of 12.18 (SD=1.65) questions in a total of 15.

Students in grade 12 illustrated higher knowledge score (M=12.44, SD=1.18) than grade 10

(M=12.07, SD=1.82). Female students illustrated higher knowledge score (M=12.25, SD=1.59) than

Male students (M=12.10, SD=1.73). Students whose parents are government officials illustrated the highest knowledge score (M=12.39, SD=1.84) followed by parents who are office workers

(M=12.22, SD=1.53).

Students illustrated Risk Perception of contracting COVID-19 with the average score of 2.81 (SD=1.25) from 5. Students in grade 11 illustrated the highest on average the Risk Perception of contracting COVID-19 (M=3.14, SD=1.11) followed by students in grade 10 (M=2.74, SD=1.26). Male students showed higher average Risk Perception of contracting COVID-19 (M=2.96, SD=1.26) than female students (M=2.70, SD=1.24). Students whose parents are Agriculturist / Fisherman / Business owner illustrated the highest

Risk Perception of contracting COVID-19 score (M=3.04, SD=1.27) followed by parents who are Government official (M=2.85, SD=1.23). Students in grade 10 illustrated the highest on average the Confidence in the government in handling the pandemic (M=1.18, SD=0.41) followed by students in grade 12 (M=1.14, SD=0.50). Male students showed higher average Confidence in the government in handling the pandemic

(M=1.15, SD=0.48) than female students (M=1.12, SD=0.34). Students whose parents are Factory worker illustrated the Confidence in the government in handling the pandemic score

(M=1.26, SD=0.53) followed by parents who are Agriculturist / Fisherman / Business owner

(M=1.11, SD=0.31).

**Table 1. Differences in outcomes according to the sociodemographic characteristic of participants (N=334)**

Sociodemographic characteristics	n (%)	Knowledge about COVID-19 (Range 0-15) M (SD)	Risk Perception of contracting COVID-19 (Range 1-5) M (SD)	Confidence in the government in handling the pandemic (Range 1-5) M (SD)
<b>Year Level</b>				
Grade 10	110 (32.9)	12.07 (1.82)	2.74 (1.26)	1.18 (0.41)
Grade 11	112 (33.5)	12.04 (1.85)	3.14 (1.11)	1.08 (0.27)
Grade 12	112 (33.5)	12.44 (1.18)	2.56 (1.31)	1.14 (0.50)
<b>Gender</b>				
Male	145 (43.4)	12.10 (1.73)	2.96 (1.26)	1.15 (0.48)
Female	189 (56.6)	12.25 (1.59)	2.70 (1.24)	1.12 (0.34)
<b>Occupation of</b>				

parent				
Government official	66 (19.8)	12.39 (1.84)	2.85 (1.23)	1.11 (0.31)
Agriculturist / Fisherman / Business owner	130 (38.9)	12.19 (1.64)	3.04 (1.27)	1.14 (0.46)
Factory worker	46 (13.8)	11.78 (1.59)	2.76 (1.37)	1.26 (0.53)
Office worker	92 (27.5)	12.22 (1.53)	2.50 (1.12)	1.09 (0.28)
<b>Total</b>	334 (100)	12.18 (1.65)	2.81 (1.25)	1.13 (0.41)

This table illustrated the answer of intent to be vaccinated. Overall, Choice “No” (n=223, 66.77%) has been chosen more than “Yes” (n=111, 33.23%). Most students in grade 11 choose “No”

(n=79, 70.54%). Most Female students choose “No” (n=125, 66.14%). Students whose parents are Agriculturist / Fisherman / Business owner choose “No” (n=93, 71.54%) followed by Office worker (n=59, 64.13%). Table 2.

**Table 2. Intention to be vaccinated by participant characteristic (N=334)**

	N	Intent to be vaccinated, n%		P Value
	334	Yes (n=111,33.23%)	No (n=223,66.77 %)	
<b>Year Level</b>				.466
Grade 10	110	41(37.27)	69(62.73)	
Grade 11	112	33(29.46)	79(70.54)	
Grade 12	112	37(33.04)	75(66.96)	
<b>Gender</b>				.781
Male	145	47(32.41)	98(67.59)	
Female	189	64(33.86)	125(66.14)	

<b>Occupation of parents</b>				.532
Government official	66	24(36.36)	42(63.64)	
Agriculturist / Fisherman / Business owner	130	37(28.46)	93(71.54)	
Factory worker	46	17(36.96)	29(63.04)	
Office worker	92	33(35.87)	59(64.13)	

Results from the generalized linear model indicated that Knowledge about COVID-19 (Beta=.787,  $p < 0.01$ ) could predict willingness to be vaccinated against COVID-19 at 78.7% Table 3.

**Table 3. Binary logistic regression predicting intention to get vaccinated against COVID-19**

	$\beta$	SE	Sig	EXP ( $\beta$ )
Year Level	.138	.146	.346	1.147
Gender	.035	.246	.887	1.036
Occupation	-.051	.110	.642	.950
Knowledge about COVID-19	-.269	.078	.001	.764
Risk Perception of contracting COVID-19	.140	.098	.154	1.150
Confidence in the government in handling the pandemic	-.429	.288	.316	.651

Reasons for COVID-19 Vaccine Hesitancy of “No” responses (n=223, 100%). Most Reasons for COVID-19 Vaccine Hesitancy is Preferred more choices of vaccine than what being provided by the government (n=157, 70.41%) followed by Concerned on unforeseen (both short term and long term) side effects (n=32, 14.35%). Table 4.



**Table 4.**

Reasons for COVID-19 Vaccine Hesitancy		No N=223, (100%)	Total N=223, (100%)
1	Concerned on unforeseen (both short term and long term) side effects	32 (14.35%)	32 (14.35%)
2	Preferred more choices of vaccine than what are available	157 (70.41%)	157 (70.41%)
3	Personal reasons such as not convenient to travel to get vaccinated.	11 (4.93%)	11 (4.93%)
4	Don't feel risk getting COVID-19	23 (10.31%)	23 (10.31%)

## Discussion

A total of 334 students participated in the study, most participants had good knowledge about COVID-19, moderate level of risk perception of contracting COVID-19 and low confidence in the government in handling COVID-19. For willingness to be vaccinated 33.23% (n=111) had intention to get vaccinated against COVID-19 while 66.77% (n=223) didn't have plans to get vaccinated against COVID-19. Grade 10 had the highest percentage of willingness to get vaccinated at 37.27% (n=41) followed by grade 12 (33.04%, n=37). Students whose parent's occupations were factory workers had the highest vaccine acceptance rate at 36.96% (n=17), followed by government officials (36.36%, n=24) and office workers (35.87%, n=33), respectively. Common reasons for vaccine refusal were preferred more choices of vaccine than what were available (70.41%, n=157), followed by concerned on unforeseen side effects (14.35%, n=32) and do not feel risk getting COVID-19 (10.31%, n=23) respectively.

Most participants were high school students, grade 10-12, who had a high COVID-19 vaccine refusal rate (66.77%). A study about Attitude and acceptance of a coronavirus disease 2019 vaccine among university students in Chiangmai University, Thailand, conducted by Jidapa Wattanasiri (2021) found that vaccine acceptance rate among university students was 53% [11]. This could be attributed to Thailand's vaccine policy that was to provide either Sinovac or

AstraZeneca as main COVID-19 vaccines for people [12]. Therefore, participants felt hesitated to get vaccinated. Including online learning at home gives students a low risk perception of contracting COVID-19 as shown in average this research, the respondents perceived the risk perception of contracting COVID-19 at 2.81 (SD=1.25). The number of coronavirus cases continues to increase, and the daily mortality rate is also increasing. That's what prompted the government to announce a lockdown and announced that academies would shut down all educational systems in high-risk areas. The high-risk areas are those where there is a large number of coronavirus infections and cannot be controlled. The TNN online reported that Public confidence in government health administration and many questions have been raised about vaccines. During the shortage of vaccines, the government delayed allocation of vaccines and the resulting vaccines were of low quality, and there was talk of the backlog of vaccines without the government's ability to explain. This may be a major consequence of the people's lack of confidence in the government's public health administration. The government's lockdown announcement and the inability to contain the outbreak has led to the continual rise in the number of infections, further decreasing people's confidence in the government [13]. The PPTV news agency reported that communication problems about vaccines. The government will focus on policy communication quite a lot. As a result, communication to the people is still

ineffective as it should be until the message has passed to the people, it has been reduced in many stages, such as filtering through various media, the limitation of capturing people's issues is different. Here, if compared to the phenomenon of other report Make it more confident. And how should the government adjust its communication strategy to induce people's confidence? And this may cause people's lack of confidence and no need for vaccination [14]. "the population being convinced of the utility of vaccination in general but nonetheless being hesitant about the Covid-19 vaccine. Communication campaigns will need to inform on the safety and efficacy of Covid-19 vaccination to encourage uptake" The above from Willingness to get vaccinated against covid-19: profiles and attitudes towards vaccination by Bruxelles Woluwe illustrated the importance of communication in the field of vaccines [15].

**Limitation** When the research took place during the third COVID-19 wave in Thailand, from July 2021, COVID-19 vaccination rollout began for students in high school which excluded the majority of the participants in this study (aged 16-18). Moreover, the Google form survey was limited to students with access to the internet and a connecting device who belong to school social media groups.

## Conclusions

The Ministry of Public Health should educate about COVID-19 and vaccines so that high school students have enough knowledge to make informed decisions about vaccination. Governments should not ignore negative news about vaccines and should communicate accurate information about vaccines to all citizens of the country. Most importantly, the government must import vaccines that are certified as highly effective vaccines and can be used for students in schools so that they can open regular teaching so that students can study at full capacity.

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## Conflict of interests

Author declared no conflict of interests

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