Attitudes towards vaccination against COVID-19 among students in grades 10-12

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Abstract: **The objective of this descriptive research is to study factors influencing Covid-19 vaccine attitudes. This research studied a group of Grade 10-12 students from Triam Udom Suksa School in Bangkok. All students of Triam Udom Suksa School were invited to participate in completing an online questionnaire, a total of 201 students participated during June – September 2021. The data collected were analyzed by using descriptive statistics and multiple regression analysis. The results showed that the majority of samples were female, studied in Science-Math program. The students revealed good knowledge about Covid-19 and Covid-19 vaccination (score=15.55, S.D.=1.89) and good attitude to acceptability of Covid-19 vaccines (score=40.40, S.D.=3.85). Knowledge about Covid-19 and Covid-19 vaccines positively correlated with attitude to acceptability of Covid-19 vaccines (r=.028**, p=0.01). Worry about sickness form Covid-19 was showed higher predicted attitude to acceptability of Covid-19 vaccines than knowledge about Covid-19 and Covid-19 vaccines at β=.078 and β=.034 respectively. On the contrary, having chronic diseases was a major factor negatively attitude to acceptability of Covid-19 vaccines (β= -.090).**

In total, 201 individual answers were received. Overall, 141 respondents (70.1%) reported unwillingness to receive a vaccine for Covid-19. Mainly, they did not believe in efficiency of the Covid-19 vaccines and they worried about safety in the Covid-19 vaccination. This research aims to study attitudes in Covid-19 vaccination of high school students. A majority of participants were less than 18 years old. While during survey, there were only Covid-19 vaccines authorized for adults age 18 and over in Thailand. For this reason, this affects unwillingness of many respondents to receive a Covid-19 vaccine. Therefore, to increase Covid-19 vaccination acceptance of people in the age group, the government sector such as Food and Drug Administration should approve a Covid-19 vaccine for people who are age less than 18 years old as soon as possible and communicate the usefulness of vaccination against infectious diseases.

Keywords: **Covid-19 vaccine, high school students, infectious diseases.**

1. INTRODUCTION

Background and Significance

During the past 1-2 years, there has been an epidemic of a new strain of the virus that causes pneumonia. After being named coronavirus disease 2019 (COVID-19), the first case was found in December 2019 at a wild trade market or fresh seafood market, Wuhan City, Hubei Province, China, Later, the World Health Organization (WHO) upgraded it to a global pandemic (Pandemic). On January 12, 2020, a Chinese female tourist was found for the first time. The first in Thailand and counted as the first infected person found outside China then as the epidemic spreading to many parts of the world, COVID-19 can leave people with severe pneumonia that can be fatal. The virus can spread from person to person through coughing and sneezing or contact with the secretions of patients [1]. After the infection enters the respiratory tract by entering the cells and multiplying in both the upper respiratory tract., lower respiratory tract and gastrointestinal, the incubation period for the disease is 2-21 days, with an average of 4-6 days, so in general, 14 days of surveillance for those exposed to the disease [2]. As it continues to ripple around the world, drug and vaccine researchers around the world are developing a range of

vaccines with potential against COVID-19. These vaccines are designed to key the body's immune system to recognize and fight the virus that causes COVID-19, thus the vaccine must be safe for the body as well. [3]. Now there is a vaccine for COVID-19 which many species have been developed and produced successfully. Some vaccines are licensed with emergency registration (Emergency Use Authority (EUA) from the manufacturer's country and from the country where the vaccine is used. Some vaccines may not be licensed yet, but some governments use them first. For Thailand, the Ministry of Public Health takes into account safety and benefits to the people. So all the COVID-19 vaccine products used in the country must be reviewed by a committee consisting of experts from various fields to consider a special license called "Conditional approval for emergency use authorization" from the Food and Drug Administration during the COVID-19 outbreak situation [4].

According to information from the Center for Situation Administration of the Coronavirus Disease 2019 (COVID-19) or CCC, the Coronavirus Disease 2019 Situation as of June 11, 2021 found that many infected people as 175,639,577 cases and 3,789,362 deaths worldwide, a death rate of approximately 2.16%, while Thailand is the world's 80th ranking for 189,828 infected people and 1,402 cumulative deaths at 0.74% [5].   The criteria for vaccination in Thailand must be a registered vaccine approve by the Food and Drug Administration (FDA). There are 5 types that are approved for using with people aged 18 years and over currently: (1) AstraZeneca Vaccine by AstraZeneca (Thailand) Co., Ltd. (2) Sinovac's Coronavac vaccine imported by the Government Pharmaceutical Organization (3) Johnson & John Vaccine Sanson by Jansen-Selac Co., Ltd. (4) Moderna vaccine by Zillic Pharma Co., Ltd. (5) Sinofarm vaccine by Biogenie Tech Co., Ltd. However; the only 2 types of vaccines that are actually given to people are the AstraZeneca vaccine. (AstraZeneca) from the UK and the COVID-19 vaccine Sinovac (Sinovac) from China [6]. People who have been vaccinated can still be infected with COVID-19, with the overall effectiveness in preventing infection representing around 50% - 95%, depending on the brand. Only getting the vaccine will help alleviate the severity of the illness and reduce the mortality rate. For some people, vaccination may have side effects such as pain, swelling, redness, itching at the site of the vaccination and may feel weak, tired, a slight headache, fever, tremors muscle and joint aches, nausea, dizziness, flushing, low blood pressure, fast heartbeat, shortness of breath, nasal congestion, thromboembolism, paralysis-like symptoms, which may be a temporary neurological disorder or some people have a severe allergic reaction that can lead to death [7]. The Ministry of Higher Education, Science, Research and Innovation (TSU) has concluded a report on the monitoring and processing of COVID-19 vaccinations worldwide, approximately 2,264 million doses have been vaccinated in 199 countries, the ASEAN region has vaccinated 62,320,833 doses and Thailand has a total of 5,667,058 doses of COVID-19 vaccination, with 4,143,444 doses being the first injection. It was 6.3% of the population and the second injection was 1,523,614 doses, representing for 2.3% of the country's population [8] of Thailand recently. It can be seen that the efficiency and side effects information of vaccination may be unclear. Therefore, there cannot be clearly compared. Nevertheless, health authorities around the world still recommend vaccination because the benefits that are compared the higher the risk of contracting COVID-19 whereas the statistical data of vaccinated persons is very small compared to the population of the whole country. This could be due to information about the vaccine's efficiency and side effects including the types of vaccines registered and allowed to be vaccinated in the country only 2 types, which are not diverse enough for those who want to choose or compare information before vaccination. Moreover, the vaccine is not approved for children and young people under 18 years, who are the majority of the population in the study.

Objectives

1. To study the factors affecting attitudes towards vaccination against COVID-19

2. To find ways to promote the positive attitudes towards vaccination against COVID-19

Study Method

This research is a quantitative study of students in grade 10-12 at Triam Udom Suksa School, Bangkok during June – September 2021 by the study sample of 201 from a total of 4,510 students (Registration of Triam Udom Suksa School, 2021).

Research Tools

The research tool was a questionnaire created by the researcher based on the theoretical idea and related research consists of 4 parts:

Part 1 Demographic or personal data of respondents, the questionnaire was a multiple choice of   6 questions.

Part 2 Quiz on your knowledge about COVID-19 and the COVID-19 vaccine, 20 questions, 20 points. The questions were multiple choice, with only 1 correct option. The scoring criteria were 1 point correct answer and 0 point wrong answer or no answer 0 point.

Part 3, The COVID-19 Vaccination Attitude Test, 10 items, 50 points. The question was a single-answer multiple choice from a 5-point scale, ranging from "disagree" to "agree". There are both positive and negative aspects of the question. The scoring criteria were 1, 2, 3, 4 and 5 respectively for the positive questions but if it's a negative question, the scoring criteria are used in the opposite way.

Part 4: Additional questions asking reasons for reluctance to receive the COVID-19 vaccine, 1 item, no score. The question was a one-answer, single-answer from four options: (1) Concern about vaccine safety, (2) Not confident in the quality of primary vaccines provided by the government, and (3) Not confident about remedial measures if caused side effects from vaccines; and (4) believe that if you can protect yourself well,   you will not get sick without the need for vaccination.

2. DATA ANALYSIS

1. Analyze general information Knowledge of COVID-19 and the COVID-19 vaccine and attitudes towards vaccination against COVID-19 using descriptive statistics such as frequency, %age, mean, standard deviation (Standard Deviation).

2. Analyze the factors that are related to attitudes towards vaccination against COVID-19 by using inferential statistics such as Multiple Regression Analysis.

3. STUDY RESULTS

This research studied the population of 201 students in grade 10-12 at Triam Udom Suksa School. Most of them were female (68.7 %), were studying in grade 10 (48.8 %) in science-math program (75.1%), and most of them were in good health condition without any congenital disease (84.6%). Most of the respondents admitted that they were at risk of contracting COVID-19 but had mild symptoms (56.2 %) as shown in Table 1.

Table 1: Demographic Factors Knowledge of COVID-19 and the COVID-19 vaccine and attitude towards vaccination against COVID-19

Demographic Information	N (%)	Knowledge about COVID-19 and COVID-19 vaccine M (SD)	Attitude towards vaccination against COVID-19 M (SD)
Gender			
Male	63 (31.3)	15.48 (1.92)	40.68 (3.60)
Female	138 (68.7)	15.59 (1.89)	40.28 (3.96)
Grade			
Grade 10	98 (48.8)	15.34 (1.94)	40.45 (3.56)
Grade 11	75 (37.3)	15.76 (1.83)	40.69 (4.28)
Grade 12	28 (13.9)	15.75 (1.88)	39.43 (3.57)
Study Program			
Science-Math	151 (75.1)	15.62 (1.88)	40.40 (4.03)
Arts-Math	17 (8.5)	14.76 (1.75)	41.35 (2.69)
Arts-Languages	33 (16.4)	15.64 (2.01)	39.91 (3.49)
Congenital Disease			
Don't have	170 (84.6)	15.66 (1.86)	40.56 (3.70)
Have	31 (15.4)	14.97 (2.02)	39.52 (4.53)
The risk of contracting COVID-19 in the future			
Having a risk with mild symptoms.	113 (56.2)	15.77 (1.89)	40.14 (3.72)
Having a risk with severe symptoms.	20 (10)	15.60 (1.96)	40.40 (4.03)
No risk	68 (33.8)	15.18 (1.86)	40.84 (4.02)
Total	**201 (100)**	**15.55 (1.89)**	**40.40 (3.85)**

From the analysis of knowledge about COVID-19 and the COVID-19 vaccine found that the average score on knowledge about COVID-19 and the COVID-19 vaccine was 15.55 (S.D. = 1.89) out of 20, female had a level of knowledge about COVID-19 and the COVID-19 vaccine higher than Male at 15.59 (S.D. = 1.89) and 15.48 (S.D. = 1.92), respectively. The Grade 11 group had the highest level of knowledge about COVID-19 and the COVID-19 vaccine at 15.76 (S.D. = 1.83), followed by the Grade 12 group at 15.75 (S.D. = 1.88) and the Grade 10 group had the lowest knowledge at 15.34 (S.D. = 1.94). Art-Language Study Program group had the highest of knowledge about COVID-19 and the COVID-19 vaccine at 15.64 (S.D. = 2.01), followed by the science-math study program at 15.62 (S.D. = 1.88) and the art-math program had the lowest knowledge at 14.76 (S.D. = 1.75), but if analyzed by health group, it was found that the healthy students without congenital disease had a level of knowledge about COVID-19 and the COVID-19 vaccine higher than students with congenital disease at 15.66 (S.D. = 1.86) and 14.97 (S.D. = 2.02), respectively. On the other hand, when analyzing base on their relief that how risky they are contracting COVID-19, it found that those who thought they were at risk with mild symptoms was the highest at 15.77 (S.D. = 1.89), followed by those who thought they were at risk with severe symptoms at 15.60 (S.D. = 1.96) and those who thought they were not at risk by the lowest at 15.18 (S.D. = 1.86) according to Table 1.

From the analysis of attitudes towards vaccination against COVID-19, it was found that the mean score on the attitude to vaccination against COVID-19 was 40.40 (S.D. = 3.85) out of 50. Male had an attitude score on vaccination against COVID-19 higher than Female at 40.68 (S.D. = 3.60) and 40.28 (S.D. = 3.96), respectively. The Grade 11 group had the highest attitude score on COVID-19 vaccination at 40.69 (S.D. = 4.28), followed by the Grade 10 group at 40.45 (S.D. = 3.56), and the Grade 12 group had the lowest score at 39.43 (S.D. = 3.57). Art-Math Program group had the highest score on the COVID-19 vaccination attitude at 41.35 (S.D. = 2.69), followed by the science-math study program at 40.40 (S.D. = 4.03) and the art-language program had the lowest score at 39.91 (S.D. = 3.49). However; analyzing by health group, it was found that the group of students who thought they were not at risk of contracting COVID-19 had higher than the students with Congenital Disease at 40.56 (S.D. = 3.70) and 39.52 (S.D. = 4.53), respectively. Those who thought they are not at risk of contracting COVID-19 had the highest COVID-19 vaccination attitude score at 40.84 (S.D. = 4.02), followed by those who thought they were at risk of contracting COVID-19 with the severe symptoms at 40.40 (S.D. = 4.03) and those who thought they were at risk of contracting COVID-19 with the mild symptoms had the lowest score at 40.14 (S.D. = 3.72) according to Table 1.

Table 2: Relationship between knowledge of COVID-19 and the COVID-19 vaccine and the attitude towards vaccination against COVID-19 Pearson Correlation

Variable	Knowledge of COVID-19 and the vaccine COVID-19	Attitude towards vaccination against COVID-19
Knowledge of COVID-19 and the vaccine COVID-19	1	0.028
Attitudes towards vaccination against COVID-19	0.028	1
Correlation is significant at the 0.01 ****Correlation is significant at the 0.05		

From analyzing the relationship between knowledge about COVID-19 and the COVID-19 vaccine and the attitudes towards against the COVID-19 vaccine, it was found that the level of knowledge about COVID-19 and the COVID-19 vaccine was a positive correlation with COVID-19 vaccination attitude (r=.028**, p=0.01) according to Table 2.

Table 3: Factors affecting attitudes towards vaccination against COVID-19

Independent Variable	B	SE	EXP (β)	Sig (p)	95% CI	
					Lower	Upper
Gender	-0.36	0.6	-0.043	0.549	-1.544	0.824
Grade	-0.281	0.388	-0.052	0.469	-1.046	0.484
Study Program	0.007	0.373	0.001	0.984	-0.728	0.742
Congenital Disease	-0.962	0.766	-0.09	0.211	-2.473	0.549
Concern about COVID-19 infection	0.326	0.305	0.078	0.286	-0.275	0.927
Knowledge of COVID-19 and the vaccine COVID-19	0.069	0.148	0.034	0.642	-0.223	0.361

When considering the regression coefficient (β) from the data analysis of all 6 variables, it was found that concerns about the risk of contracting COVID-19 was the factor that had the most positive effect on attitudes towards vaccination against COVID-19 (β=.078), followed by knowledge about COVID-19 and the COVID-19 vaccine (β=.034), while the congenital disease was the most negative factor affecting attitudes towards vaccination against COVID-19 (β=-.090).

Table 4: Reasons for reluctance to receive the COVID-19 vaccine

Reason for unwillingness of COVID-19 vaccination	Amount (person)	Percentage (%)
(1) Concern about Vaccine Safety	33	23.4
(2) Not confident in efficiency of the main vaccine from the government providing	85	60.3
(3) Not confident in the remedial measurement in case of vaccine allergy	10	7.1
(4) Believe that taking care of own self can prevent COVID-19 infection	13	9.2
Total	**141**	**100**

Out of the 201 respondents, 141 were reluctant to get the COVID-19 vaccine, or 70.1%. Most were not confident in the effectiveness of the main vaccine provided by the government, 85 respondents (60.3%), followed by concern about the safety of vaccines at 33 respondents (23.4%), believing that if they protect themselves well, they won't infect COVID-19 at 13 respondents (9.2%) and 10 respondents were unsure of remedial measures for side effects after vaccination (7.1%), respectively.

4. DISCUSSION

A Study of Attitudes Towards COVID-19 Vaccination of Grade 10-6 students at Triam Udom Suksa School Of the 201 respondents, 68.7% of the respondents were female, 75.1% were enrolled in the Science-Math program, 84.6% of respondents had no congenital disease, and 84.6% of respondents believed they were at risk of contracting COVID-19 but having mild symptoms, 56.2% of the respondents had knowledge of COVID-19 and COVID-19 vaccine at a good level, a score of 15.55 (S.D.=1.89) out of a full score of 20, and a good attitude to get a COVID-19 vaccine, a score of 40.40 (S.D.=3.85) out of a full score of 50 on the knowledge-related level of COVID-19 and the COVID-19 vaccine. There was a positive correlation with attitudes towards vaccination against COVID-19 (r=.028**, p=0.01). According to the Multiple Regression Analysis, concerns about the risk of contracting COVID-19 were positive. It was a factor that influenced attitudes towards COVID-19 vaccination (β=.078) more than the level of knowledge about COVID-19 and the COVID-19 vaccine (β=.034), while the congenital disease was the most influencing factor in opposing attitudes towards vaccination against COVID-19 (β=-.090). From 201 respondents, 141 were reluctant to get the COVID-19 vaccine. The vast majority (70.1%) of people argued that they were not confident in the vaccine's effectiveness and were concerned about the safety of the vaccine.

The result of this research study a population of Grade 10-12 students, most of whom are under 18 years, showing that although the respondents were knowledgeable about COVID-19 and the COVID-19 vaccine and attitudes towards vaccination against COVID-19 at a good level and have a positive correlation with each other but still concern about the risk of contracting COVID-19 and congenital disease is a factor that has a more negative influence on attitudes towards vaccination against COVID-19. Besides, at the time of the study, there was no vaccine against COVID-19 which has been registered for using with people under 18 years old by the Food and Drug Administration (FDA), resulting in a large number of reluctance to get the COVID-19 vaccine. COVID-19 Vaccine acceptance in the population under the age of 18 or more should speed up testing and registration to approve the usage of COVID-19 vaccine for people under 18 years and publicize the awareness of COVID-19 vaccination significance as soon as possible.

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