

# Perception of Adverse Reactions after COVID-19 Vaccine Receipt among HighSchool Students in Klongsamwa District in Bangkok

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## Abstract

**Background:** Thailand is currently in the midst of a spike of new infections. Guidance from WHO Thailand regarding the outbreak of novel coronavirus (COVID-19) that was first reported from Wuhan, China. The spread of COVID-19 has caused many deaths. We can prevent COVID-19 infection by vaccination because vaccination will help alleviate the symptoms of the disease. Side effects of getting vaccinations are tiredness, headache, muscle pain, chills, fever and nausea.

**Objective:** To assess adverse effects of vaccination among high school students in Bangkok

## Study Methods:

The study was conducted during february-april 2021. A total of 160 students participated. COVID-19 related knowledge, stress Level after COVID-19 vaccine receipt and perception of adverse effects after receipt of COVID-19 vaccination were assessed. Differences between outcomes and sociodemographics were analysed through independent t-test and the ANOVA. For perception of adverse effects after receipt of COVID-19 vaccination were analysed by a generalised linear model.

**Result:** From the respondents 160 people it was found the respondents have knowledge about the COVID-19 was at a moderate ( $M=7.71$ ,  $SD=1.70$ ), Stress Level after COVID-19 Vaccine receipt was at a low level ( $M=5.69$ ,  $SD=2.45$ ) and Perception of adverse effects after receipt of COVID-19 vaccination was a low level ( $M=10.74$ ,  $SD=3.24$ ). There were positive correlation between Stress Level after COVID-19 Vaccine receipt and Perception of adverse effects after receipt of COVID-19 vaccination ( $r=0.665$ ) and a negative correlation between Vaccine related knowledge and Perception of adverse effects after receipt of COVID-19 vaccination ( $r=-0.228$ ). Predictive factors of Perception of adverse effects after receipt of COVID-19 vaccination were gender (Bate=.157,  $p<0.01$ ) and Stress Level after COVID-19 Vaccine receipt (Bate=.662,  $p<0.01$ ).

**Conclusion:** COVID-19 related participant's knowledge about the COVID-19 was at a moderate level, participant's stress level after COVID-19 vaccine was at a low level and participant's perception of adverse effects after receipt of COVID-19 vaccination was low. There were positive correlation between Stress Level after COVID-19 Vaccine receipt and Perception of adverse effects after receipt of COVID-19 vaccination ( $r=0.665$ ) and a negative correlation between Vaccine related knowledge and Perception of adverse effects after receipt of COVID-19 vaccination ( $r=-0.228$ ). Predictive factors of Perception of adverse effects after receipt of COVID-19 vaccination were gender (Bate=.157,  $p<0.01$ ) and Stress Level after COVID-19 Vaccine receipt (Bate=.662,  $p<0.01$ ).

level. From the results, it is recommended that more information about COVID-19 should be spread in the news and respondents should study about this epidemic for their own benefit.

**Keyword:** COVID-19, Perception of Adverse Effect, Vaccine receipt, COVID-19 vaccine

## Introduction

The covid19 pandemic originating from Wuhan. Capital city of Hubei Province China in December 2019 and has begun to spread around the world. Stopping the spread of COVID-19 can be done in two ways: 1. Getting vaccinated 2. Stopping the epidemic based on the chain of infection principle [1].

In this study, it will discuss how to stop the spread of COVID-19 with the principle of chain of infection. There are several ways to prevent transmission from COVID-19 namely get the vaccinated because COVID-19 vaccines are highly effective at preventing and alleviating the symptoms of disease, wear a mask it can help lower the odds, social distancing and wash your hand frequently to prevent the infection from touching our things [2]. The best way that can prevent the COVID-19 is to get the vaccinated because if you get COVID-19 but you already got COVID-19 vaccinated the symptoms will reduce especially becoming severely ill [3].

Adverse reactions after COVID-19 vaccination can be common side effects, less common side effects and long term side effects. Mostly the effects that people have are common side effects

can be pain at the injection site, fever, fatigue, headache, muscle pain, chills and diarrhoea; mostly the side effects will go away within a few days. Less common side effects [4].

Meanwhile adverse reactions in children after receiving the COVID-19 vaccine most of the time, will not have as many symptoms as adults, but they could probably have common vaccine side effects : pain, swelling , redness , fever, tiredness, headache, chills, muscle or joint pain and swollen lymph nodes [5].

There is no published research in this study. While doing this study Therefore , the researcher is interested in studying since there aren't many studies upon it intrigues the researcher writer to further study on this matter.

## Methods

### Participants and procedure

This was a cross-sectional observational study. An online questionnaire was purposely developed and made available through Google Form between February-April 2022. All students who were eligible and were invited to participate in the study. The invitation was sent by email that all eligible for this study receive equal chance to participate in the study. The students have access to school emails, so they all receive an invitation. In this invitation, information about the objectives of the study as well as the ethical guarantee of confidentiality and anonymity in the data collected as stated in the informed consent were explained. Participation was completely free and voluntary, and no personal data were collected from any participant. Of the 253 students , a total of 160 students participated in the study (response rate: 63.24 %).

### Instrument

The questionnaire was developed based on a literature review including [1] COVID-19, COVID-19 vaccine, effects from COVID-19, mental health from WHO, CDC [2] previous studies on the related topic. A preliminary version of the instrument was reviewed by 3 researchers in the field to validate its content. A pre-test was performed with a small sample of students to test for comprehension and difficulty. The psychometric characteristics of the questionnaire were tested, as described in the statistical analysis subsection.

The final version of the questionnaire contained 22 questions; 5 about socio demographic data (gender, age, type of vaccine receipt, level of stress after vaccine receipt, feedback from family after vaccine receipt) and 17 items divided into 2 sections

COVID-19 and Vaccine related knowledge : this scale consisted of 10 questions. The participants were asked to choose the correct answer from multiple choices of 4. One point was assigned to each correct answer, while providing an incorrect answer received zero points. The sum of all items was made hence higher scores corresponded to a higher level of knowledge.

Stress Level after COVID-19 vaccine receipt : this scale was composed of 2 items, and response categories consisted of a Five-point likert scale (from 1-Not at all, to 5 Yes) with the highest score corresponding to more stress after vaccine receipt. A sum of all the items was made to obtain a score. The "Stress Level after COVID-19 vaccine receipt" consisted of 2 items and varied from 2 to 10 and the higher values corresponded to a strong level of stress after COVID-19 vaccine receipt.

Perception of adverse effects after receipt of COVID-19 vaccination : this scale was composed of 7 items, and response categories consisted of a three-point likert scale (from 1-Not at all, to 3 Yes) with the highest score corresponding to more adverse effects toward vaccine receipt. A sum of all the items was made to obtain a score. The "Perception of Adverse Affect after COVID-19 vaccine receipt" consisted of 7 items and varied from 7 to 21 and the higher values corresponded to a strong perception of adverse effects after COVID-19 vaccine receipt.

### Statistical analysis

The analysis was performed using SPSS for windows, version 26. To analyse psychometric characteristics of the scales, an exploratory factor analysis, using principal component analysis with varimax rotation, was carried out. Reliability was analysed through the calculation of item-total correlation coefficients and Cronbach's alpha ( $\alpha$ ) for the scales of the questionnaire. The descriptive analysis were presented in absolute (n) and relative (%) frequencies, mean (M) and standard deviations (SD). To assess the differences between the outcome variables (Knowledge, Stress Level after COVID-19 Vaccine receipt, Perception of Adverse Affect after COVID-19 vaccine receipt) and the sociodemographic characteristics, considering the sample size, independent t-test and the ANOVA were used as appropriate. The correlations between the outcomes of the study were calculated by Pearson's correlation. Lastly, a generalised linear model was calculated to determine the predictive

variables of the preventive behaviours. Exp ( $\beta$ ) and the respective 95% confidence intervals (95% IC) were presented. Statistical significance was defined as  $p < 0.05$ .

### Ethical Approval.

Ethical approval was obtained from the study sites prior to data collection, and consent was assumed as completing the survey questions. Participants were informed that their participation was voluntary and that they could withdraw from the study at any point or choose not to answer any question. Participants' confidentiality was maintained as no identifying information was collected and findings will be disseminated only in aggregate.

### Ethical Considerations

This research uses an anonymous data collection method to collect data from grade 10-12 Students of Satitpattana School, panya intra road klong samwa tawan tok district klong samwa county bangkok, Thailand, by using Google form. The invitation was sent by email to schools' emails. 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 160 people. The sociodemographic characteristics of the sample are presented in Table 1. Most participants gender's were male ( $n=87, 54.4\%$ ). Most participants age's were 16 years ( $n=76, 47.5\%$ ) followed by 17 years and above ( $n=46, 28.7\%$ ) respectively. Most participants received the pfizer vaccine ( $n=143, 89.4\%$ ) and another type ( $n=17, 10.6\%$ ).

Regarding knowledge about COVID-19, participants revealed a moderate level of knowledge about COVID-19, correctly answering a mean of 7.71 ( $SD=1.70$ ). Female participants showed higher knowledge scores ( $M=8.15, SD=1.34$ ) than male participants ( $M=7.33, SD=1.88$ ). Age groups of 15 years and below showed the highest related knowledge of COVID-19 score 7.95 ( $SD=1.29$ ) followed by age groups of 16 years score 7.91 ( $SD=1.28$ ), age groups of 17 years score 7.17 ( $SD=2.39$ ). Participants who got pfizer have knowledge about COVID-19 were 7.73 ( $SD=1.69$ ) and participants who got another type of vaccine were 7.47 ( $SD=1.81$ ) respectively.

Last but not least, stress level after COVID-19 vaccine receipt COVID-19 It was found that the respondents had a feeling of being vaccinated against COVID-19 at low levels. Age groups of females showed the highest related stress level after COVID-19 vaccine receipt more than male were 5.95 ( $SD=2.61$ ) Age groups of 15 years and below showed psychological characteristics the most when compared to the other ages group. 7.21 ( $SD=2.21$ ).

Participants reported a low level of adverse effects after COVID-19 vaccine receipt. Female participants ( $M=11.29, SD=3.40$ ) revealed more side effects to vaccination than males ( $M=10.28, SD=3.04$ ). Age's group 15 years and below reported the highest side effect ( $M=12.03, SD=3.40$ ) followed age's group 17 years and above ( $M=11.57, SD=3.20$ ) and the lowest age's group were ( $M=16.966, SD=2.83$ ).

**Table 1.** Differences in outcomes according to the sociodemographic characteristics of participants (N = 160)

Sociodemographic characteristics	N (%)	COVID-19 and Vaccine related knowledge (Range 0-10) M (SD)	Stress Level after COVID-19 Vaccine receipt (Range 2-10) M (SD)	Perception of adverse effects after receipt of COVID-19 vaccination (Range 7-21) M (SD)
<b>Age</b>				
15 and below	38 (23.8)	7.95 (1.29)	7.21 (2.21)	12.03 (3.40)
16	76 (47.5)	7.91 (1.28)	5.13 (2.31)	9.66 (2.83)
17 and above	46 (28.7)	7.17 (2.39)	5.37 (2.49)	11.57 (3.20)
<b>Gender</b>				
Male	87 (54.4)	7.33 (1.88)	5.48 (2.30)	10.28 (3.04)
Female	73 (45.6)	8.15 (1.34)	5.95 (2.61)	11.29 (3.40)
<b>Type of Vaccine</b>				
Pfizer	143 (89.4)	7.73 (1.69)	5.73 (2.48)	10.83 (3.32)
Moderna / AstraZenecaviral / Vector vaccine : Johnson & Johnson / Inactivated : Shinopharm	17 (10.6)	7.47 (1.81)	5.41 (2.21)	10.00 (2.42)
<b>Total</b>	160 (100)	7.71 (1.70)	5.69 (2.45)	10.74 (3.24)

The analysis of the correlations between the outcomes of the study - knowledge, Stress Level after COVID-19 Vaccine receipt and perception after receipt of COVID-19 vaccinated -revealed the existence of positive and statistically significant correlations between perception after receipt of COVID-19 vaccinated and knowledge ( $r=-0.228^{**}$ ,  $p<0.01$ ), psychological characteristic toward perception after receipt of COVID-19 vaccinated ( $r=0.665^{**}$ ,  $p<0.01$ ). (Table2)

**Table 2.** Pearson's correlation coefficient between the study outcomes

Variables	COVID-19 and Vaccine related knowledge	Stress Level after COVID-19 Vaccine receipt	Perception of adverse effects after receipt of COVID-19 vaccination
Knowledge	1		
Stress Level after COVID-19 Vaccine receipt	-.058	1	
Perception of adverse effects after receipt of COVID-19 vaccination	-.228**	.665**	1

\*\*Correlation is Significant at the 0.01

\*Correlation is Significant at the 0.05

Results from the generalised linear model indicated that Stress Level after COVID-19 Vaccine receipt (Beta=0.662,  $p<0.01$ ), Gender (Beta= 0.157,  $p<0.01$ ) had a statistically significant effect on the perception after receipt of COVID-19 vaccinated. (Table3)

**Table 3.** Generalised linear model predicting Perception of adverse effects after receipt of COVID-19 vaccination

	B	SE	EXP ( $\beta$ )	Sig (p)	95% CI	
					Lower	Upper
Age	.463	.264	.104	.082	-.059	.985
Gender	1.016	.378	.157	.008	.270	1.763
Type of Vaccine	-.744	.591	-.071	.210	-1.911	.423
COVID-19 and Vaccine related knowledge	-.405	.113	-.213	.000	-.628	-.183
Stress Level after COVID-19 Vaccine receipt	.874	.078	.662	.000	.721	1.028

## Discussion

From the study perception after COVID-19 receipt of participants, there were 160 students participating in this study. Most participants were 16 years old (47.5%). 54.4% (n=73) were male. Most participants received Pfizer (n=143, 89.4). Participants showed a moderate level of COVID-19 and Vaccine related knowledge (M=7.71, SD=1.70). Females showed a higher knowledge average score (M=8.15, SD=1.34) than male participants. Regarding Stress Level after COVID-19 Vaccine receipt, participants reported a low level of stress level. Age groups of 15 years old and below reported the highest stress level after receiving COVID-19 vaccine (M=7.21, SD=2.21). Age groups of 15 years old and below also reported the highest average score on Perception after receiving COVID-19 vaccine (M=12.03, SD=3.40). Participants who took Pfizer revealed the highest knowledge scores (M=7.73, SD=1.69), Stress Level after COVID-19 Vaccine receipt (M=5.73, SD=2.48) as well as Perception of adverse effects after receipt of COVID-19 vaccination (M=10.72, SD= 3.24). COVID-19 and Vaccine related knowledge was negatively correlated with Perception after receipt of COVID-19 vaccination ( $r=-0.228$ ,  $p=0.01$ ). Stress Level after COVID-19 Vaccine receipt positively correlated with Perception of adverse effects after receipt of COVID-19 vaccination ( $r=0.665$ ,  $p=0.665$ ). Gender (Beta= 0.662,  $p>0.01$ ) and Stress Level after COVID-19 Vaccine receipt (Beta=0.157,  $p>0.01$ ) predicted Perception of adverse effects after receipt of COVID-19 vaccination. Most participants' children may not be following enough on the COVID-19 pandemic and COVID-19 vaccine because high school students have more things to do than follow up the news such as study and activity. Grade 10 has more knowledge than another grade maybe because grade 9 has age around 14-15 years old the age range is not need to focus on study or don't have things to do much if we compared to grade 11 and grade 12 and other reason is grade 11 and grade 12 having to start studying for college may not have enough time to focus on the COVID-19.

Female participants show they know more about COVID-19 more than male because from the research females are more stressed than male because females are more prone to daytime anxiety[6].

People that receive pfizer have more knowledge than another people that receive another vaccine because pfizer is vaccine that Thai department of health receive from north america not received from asia so people that receive pfizer is need to find the information of vaccine and it is the reasons that make people who got pfizer more stress and have anxiety more than people who give another type of vaccine. Most participants' children may not be following enough on the COVID-19 pandemic and COVID-19 vaccine because high school students have more things to do than follow up the news such as study and activity. Grade 10 has more knowledge than another grade maybe because grade 9 has age around 14-15 years old the age range is not need to focus on study or don't



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The results of the analysis of knowledge about knowledge of covid-19 and vaccine it was found that the overall answer was correct in a high percentage may be because of the results of providing comprehensive and accurate information about the COVID-19 epidemic. By the way, there are some questions that most people don't know. The first part is about general knowledge of vaccines. What are the adverse reactions to severe vaccination that require medical attention? The answer of so many people is palpitations but the true answer is overall such as dyspnea palpitations vomit at least 3 times. The second part is general knowledge of covid-19 is the prevention of covid-19 is how many recommended steps to hygienically wash your hand? The true answer should be 7 steps at least 20 seconds. So The recommendations about this part is you should read and try to follow to better prevent covid-19 disease. The conclusion about age that gets vaccinated most is 16 years and the type of vaccine that people get the most is pfizer. Feeling after getting vaccinated of their own is not much (2 levels). But the feeling of their family is not at all (0 level) it might be because their parents follow the news about the advantages of vaccines. Last but not least is the topic about perception of Adverse actions after the receipt of COVID-19 Vaccine. Most people have the same symptoms as fever. It might be because the body shows a response to the vaccine and the less symptoms are vomiting. For the advice, you should follow the guidelines strictly and read the news. Read news about the strains of COVID and how to behave and stay updated.

### Limitation

From data online collection from respondents may use the internet to find answers during the survey collecting data during the COVID-19 outbreak, during the lockdown measures, working or studying from home, respondents may not feel an infectious disease.

### Conclusion

From the respondents 160 people it was found the respondents have knowledge about the COVID-19 was at a moderate ( $M=7.71$ ,  $SD=1.70$ ), Stress Level after COVID-19 Vaccine receipt was at a low level ( $M=5.69$ ,  $SD=2.45$ ) and Perception of adverse effects after receipt of COVID-19 vaccination was a low level ( $M=10.74$ ,  $SD=3.24$ ). There were positive correlation between Stress Level after COVID-19 Vaccine receipt and Perception of adverse effects after receipt of COVID-19 vaccination ( $r=0.665$ ) and a negative correlation between Vaccine related knowledge and Perception of adverse effects after receipt of COVID-19 vaccination ( $r=-0.228$ ). Predictive factors of Perception of adverse effects after receipt of COVID-19 vaccination were gender (Bate=.157,  $p<0.01$ ) and Stress Level after COVID-19 Vaccine receipt (Bate=.662,  $p<0.01$ ).

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