International Journal of Healthcare Sciences ISSN 2348-5728 (Online)
Vol. 9, Issue 2, pp: (32-37), Month: October 2021 - March 2022, Available at: www.researchpublish.com

Knowledge, Attitude and COVID-19 Preventive Behavior among Grade 10-12 students in Bangkok, Thailand

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Abstract: **Background: Since Thailand had a COVID-19 crisis we already had 4 waves and the concentration of the crisis increased in every wave because of the mutation of the Coronavirus which can live in a more extreme environment or another it was harder to eliminate the coronavirus out of society.**

Purpose: The purpose of this study was to assess knowledge, attitudes and behaviors about COVID-19 among Siriwat Wittaya English Program School high school students.

Methodology: In August 2021, all high school students in Siriwat Wittaya English Program School were invited to participate in completing an online questionnaire. A total of 80 students participated. COVID-19 related knowledge, attitudes toward COVID-19 and preventive behaviors were assessed. Differences between outcomes and sociodemographics were analyzed through independent *t*-tests and the ANOVA. A generalized linear model was calculated to determine the predictive variables of preventive behaviors.

Findings: Students revealed moderate level knowledge about COVID-19, correctly answering 9.04 (SD=1.93) questions in a total of 15 and favorable attitudes toward preventive behaviors (M = 16.73, SD=2.39). Students reported always engaging in, on average, 5.31 (SD=2.06) of the 10 behaviors analyzed. Females presented higher levels of knowledge, more positive attitudes and engaged in more preventive behaviors than males. Being grade 10 (Exp (β) = 8.213, 95% CI: 1.791–37.670, $p < 0.01$) or grade 11 student (Exp (β) = 7.568, 95% CI: 1.598–35.835, $p < 0.05$) and having positive attitudes toward preventive behavior of COVID-19 predicted the adoption of those preventive behavior (Exp (β) = 1.340, 95% CI: 1.189–1.510, $p < 0.001$).

Conclusion: This research has a total participant of 80 people. The result indicated that this group of participants have a moderate level of knowledge of Covid-19, a high level of Attitude toward preventive behaviors, and a moderate level of Risk Perception of getting COVID-19. The result illustrates that the most effective factor was Attitude toward preventive behaviors which means the development of the Attitude toward preventive behaviors would increase the effectiveness of COVID-19 Preventive behavior. Finally, this research recommends guardians of these participants to encourage a better attitude toward covid preventive behavior by demonstrating the effect of COVID-19 to human health every week.

Keywords: **Coronavirus infection, Health knowledge, Risk reduction behavior, students Covid-19.**

1. INTRODUCTION

The coronavirus disease 2019 (COVID-19) was declared a pandemic by the WHO on March 11th 2020 due to its high rate of infection which caused thousands of deaths worldwide and continues to expand. The virus that causes COVID-19 is in a family of viruses called Coronaviridae. Antibiotics do not work against viruses. Some people who become ill with COVID-19 can also develop a bacterial infection as a complication. In this case, antibiotics may be recommended by a healthcare provider. There is currently no licensed medication to cure COVID-19 [1]. Based on epidemiological investigations, the incubation period is 1–14 days. The elderly and chronically ill are at the highest risk of COVID-19 infection.

As around the world Covid-19 has affected Thailand in various ways such as economic, quality of life, education, and citizen physical health. In Thailand there were 4 waves from 2019 till september, 2021. There were 1,581,415 cases, and 16,498 deaths as of 28 september 2021 [2]. Main economic(Traveling) flow was distracted and all the store and entertainment business was closed because of the Covid-19 measures.There were around 49,500,000 doses that have been injected to Thai people. All the educational places were closed because under 18 age groups are not in the Covid-19 vaccination plan.

This research was studied in 4-6th grade groups because they were the group that was most affected by Covid-19. Their future was up to the covid-19 situation because they received the education that they should in their age. And there were the groups that the government neglected.

Below 18 people are not in 1st vaccine roll out plan, need to prevent therefore this study aims to study factors related to covid preventive behavior of grade 10-12 students.

2. METHODS

Participants and procedure

This was a cross-sectional observational study. An online questionnaire was purposely developed and made available through Google From between 27-August-2021 and 10-September-2021. All students grade 10-12 of Siriwatwittaya School (English Program) were eligible and were invited to participate in the study. The invitation was sent by institutional email and class social media groups. The students have access to institutional email and class social media groups, 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 was collected from any participant. Of the 80 students a total of 83 students participated in the study (response rate: 96.39 %).

Instrument

The questionnaire was developed based on a literature review including (1) information about COVID-19 which included; transmission, symptoms, prevention, and vaccination from Ministry of Public Health Thailand, WHO, CDC (2) Several common items were used to assess each of the dimensions analyzed in this study in studies conducted on the same themes. The proposed items were then grouped and redundant items were removed.

A preliminary version of the instrument was reviewed by three experts to validate its content. A pretest was then performed with a small sample of [who] to test for comprehension and difficulty. All the questions remained without modifications. The psychometric characteristics of the questionnaire were tested, as described in the statistical analysis subsection.

The final version of the questionnaire contained 39 questions; 6 about socio demographic data (gender, grade level, No. of under 18 in household ,No. of above 18 in household , No. of vaccinated people in household) and 33 items divided into 4 sections.

Knowledge about COVID-19 : this scale consisted of 15 questions related to Knowledge about COVID-19,Type of Covid-19 in Thailand, How the Covid-19 infected, how to disinfect, How long Covid-19 stayed in the atmosphere, How to wear a mask properly, Covid-19 symptoms, infection period, groups that were risk to get Covid-19, how to prevent Covid-19, the death ratio infected patient, how the vaccine break the chain of infection, ratio of vaccine allergies. 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.

Attitude toward preventive behaviors : this scale was composed of 4 items, and response categories consisted of a five-point likert scale (from 1-strongly disagree, to 5 agree) with the highest score corresponding to more positive attitudes toward preventive behaviors.Some items on the scale were inverted for the analysis. A sum of all the items was made to obtain a score. The “Attitude toward preventive behaviors” factor consisted of 4 items and varied from 4 to 20 and the higher values corresponded to a more positive Attitude toward preventive behaviors.

Risk Perception of getting COVID-19 : this scale was composed of 2 items, and response categories consisted of a five-point likert scale (from 1-strongly disagree, to 5 agree) with the highest score corresponding to more positive Risk

Perception of getting COVID-19.Some items on the scale were inverted for the analysis. A sum of all the items was made to obtain a score. The "Risk Perception of getting COVID-19" factor consisted of 2 items and varied from 2 to 10 and the higher values corresponded to a more positive Risk Perception of getting COVID-19.

COVID-19 Preventive behaviors : this scale referred to the number of preventive behaviors adoption and included 12 items. The data analysis reports 12 items. Each item was answered using a five-point scale (From 1-Never to 5-Always), with one point assigned to each behavior that was always practiced. The number of behaviors practiced was added up. A high score on this scale indicated good preventive behaviors, ranging from 12 to 60.

3. 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 analyzed through the calculation of item-total correlation coefficients and Cronbach's alpha (α) for the scales of the questionnaire. The descriptive analysis was presented in absolute (n) and relative (%) frequencies, mean (M) and standard deviations (SD). To assess the differences between the outcome variables (Knowledge about COVID-19, Attitude toward preventive behaviors and COVID-19 Preventive behaviors) 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 generalized linear model was calculated to determine the predictive variables of the preventive behaviors. Exp (β) and the respective 95% confidence intervals (95% IC) were presented. Statistical significance was defined as $p < 0.05$.

Ethical Considerations

This research uses an anonymous data collection method to collect data from grade 10-12 Students of Siriwat Wittaya English Program School School, Bangkok, Thailand, by using Google form. The invitation was sent by institutional email and class social media groups to 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 was collected from any participant.

4. RESULT

This study comprised a total of 80 students. The sociodemographic characteristics of the sample are presented in Table 1. Half of the participants were female (n=40, 50%). Most participants were grade 10 (n=30, 37.5%) followed by grade 12 (n=28, 35%) and grade 11 (n=22, 27.5%) respectively. Most of the participants lived with more than 3 under the age of 18 people (n=41, 51.2%) and mostly lived with less than 3 above the age of 18 people (n=79, 98.8%). Most of the participants had less than 3 people that were vaccinated in their household (n=56, 70%). Most of the participants' parents worked in the Government official, Office worker, Teacher group (n=33, 41.3%).

Regarding knowledge about COVID-19, participants revealed normal knowledge about COVID-19, correctly answering a mean of 9.03 (SD=1.93) questions in total of 15. Female participants showed higher knowledge scores (M=9.40, SD=1.74). Group of grade 11 showed the highest COVID-19 related knowledge score of 9.50 (SD=1.74). Participants who lived with less than 3 under the age of 18 people showed the highest CIVID-19 related knowledge score of 9.26 (SD=1.90). Participants who had more than 3 above the age of 18 people showed the highest CIVID-19 related knowledge score of 10.00 (SD=0).Participants who had less than 3 vaccinated people showed the highest CIVID-19 related knowledge score of 9.20 (SD=1.80). Participants whose parents worked in the Government official, Office worker, Teacher group showed the highest CIVID-19 related knowledge score of 9.33 (SD=1.74).

Participants showed a good level of attitude toward COVID-19 preventive behavior with the average score of 16.72 (SD=2.40) from 20 full scores. Female participants showed higher Attitude toward preventive behaviors scores (M=17.18 SD=2.18). Group of grade 10 showed the highest Attitude toward preventive behaviors score of 17.13 (SD=1.81). Participants who lived with more than 3 people that are under 18 showed the highest CIVID-19 related Attitude toward preventive behaviors score of 17.17 (SD=1.88). Participants who lived with more than 3 people that their age were above 18 showed the highest CIVID-19 related Attitude toward preventive behaviors score of 17.00 (SD=0).Participants who had 3 or less vaccinated people showed the highest CIVID-19 related Attitude toward preventive behaviors score of 16.73 (SD=2.50). Participants that the parent worked in the Business owner group showed the highest CIVID-19 related Attitude toward preventive behaviors score of 17.32 (SD=2.54).

Concerning risk perception of getting COVID-19 was shown to be in a medium level with the average score of 5.31(SD=2.06) from 10 full scores.Female participants showed higher Risk Perception of getting COVID-19 scores (M=5.80 SD=1.95). Group of grade 11 showed the highest Risk Perception of getting COVID-19 score of 5.91 (SD=2.09). Participants who lived with more than 3 people that are under 18 showed the highest CIVID-19 related Risk Perception of getting COVID-19 score of 5.34 (SD=2.09). Participants who lived with less than or equal to 3 people that their age are above 18 showed the highest CIVID-19 related Risk Perception of getting COVID-19 score of 5.32 (SD=0).Participants who had 3 or less vaccinated people showed the highest CIVID-19 related Risk Perception of getting COVID-19 score of 5.32 (SD=2.12). Participants whose parents worked in other groups showed the highest CIVID-19 related Risk Perception of getting COVID-19 score of 6.14 (SD=0.90).

COVID-19 Preventive behaviors were shown to be on a good level with an average score of 48.74 (SD=8.49) from 60 full scores.Male participants showed higher COVID-19 Preventive behavior for the 4th wave scores (M=48.93 SD=10.79). Group of grade 10 showed the highest COVID-19 Preventive behavior for the 4th wave score of 49.90 (SD=8.36). Participants who lived with more than 3 people that are under 18 showed the highest CIVID-19 related COVID-19 Preventive behavior for the 4th wave score of 49.80 (SD=6.12). Participants who lived with less than or equal to 3 people that their age are above 18 showed the highest CIVID-19 related COVID-19 Preventive behavior for the 4th wave score of 48.82 (SD=8.51).Participants who have more than 3 vaccinated people showed the highest CIVID-19 related COVID-19 Preventive behavior for the 4th wave score of 49.96 (SD=6.70). Participants that the parents worked in the Business owner group showed the highest CIVID-19 related COVID-19 Preventive behavior for the 4th wave score of 51.16 (SD=5.98).

Table 1: Sociodemographic characteristics participant (N=80)

Sociodemographic characteristics	N (%)	Knowledge about COVID-19 (Range 0-15) M (SD)	Attitude toward preventive behaviors (Range 4-20) M (SD)	Risk Perception of getting COVID-19 (Range 2-10) M (SD)	COVID-19 Preventive behavior (Range 12-60) M (SD)
Gender					
Male	40 (50)	8.68 (2.06)	16.28 (2.52)	4.83 (2.07)	48.93 (10.79)
Female	40 (50)	9.40 (1.74)	17.18 (2.18)	5.80 (1.95)	48.55 (5.44)
Grade Level					
Grade 10	30 (37.5)	9.33 (1.47)	17.13 (1.81)	4.83 (2.26)	49.90 (8.36)
Grade 11	22 (27.5)	9.50 (1.74)	16.18 (2.79)	5.91 (2.09)	46.41 (11.23)
Grade 12	28 (35)	8.36 (2.33)	16.71 (2.58)	5.36 (1.73)	49.32 (5.60)
No.Family member < 18					
1-3	39 (48.8)	9.26 (1.90)	16.26 (2.77)	5.28 (2.05)	47.62 (10.38)
Above 3	41 (51.2)	8.83 (1.95)	17.17 (1.88)	5.34 (2.09)	49.80 (6.12)
No.Family member > 18					
1-3	79 (98.8)	9.03 (1.93)	16.72 (2.40)	5.32 (2.07)	48.82 (8.51)
Above 3	1 (1.3)	10.00 (-)	17.00 (-)	5.00 (-)	42.00 (-)
No.Family got vaccinated					
1-3	56 (70)	9.20 (1.80)	16.73 (2.50)	5.32 (2.12)	48.21 (9.16)
Above 3	24 (30)	8.67 (2.18)	16.71 (2.14)	5.29 (1.97)	49.96 (6.70)
Parent occupation					
Health care workers	6 (7.5)	8.33 (1.21)	17.67 (1.97)	4.83 (2.56)	50.00 (7.27)
Government official / Office worker / Teacher	33 (41.3)	9.33 (1.74)	16.15 (2.25)	4.97 (1.86)	46.79 (10.64)
Business owner	25 (31.3)	9.16 (1.82)	17.32 (2.54)	5.76 (2.55)	51.16 (5.98)
Freelance	9 (11.3)	9.22 (1.99)	16.33 (2.55)	5.00 (1.32)	49.44 (7.21)
Others	7 (8.8)	7.57 (3.05)	17.00 (2.38)	6.14 (0.90)	47.29 (6.21)
Total	80 (100)	9.04 (1.93)	16.73 (2.39)	5.31 (2.06)	48.74 (8.49)

The analysis of the correlation between the outcomes of the study - knowledge, attitudes and risk perception and behavior revealed the existence of a positive and statistically significant correlation between attitude toward preventive behaviors (r=.512**, p<0.01), and COVID-19 preventive behaviors.

Table 2: Pearson's correlation coefficient between the study outcomes

Variables	Knowledge about COVID-19	Attitude toward preventive behaviors	Risk Perception of getting COVID-19	COVID-19 Preventive behaviors
Knowledge about COVID-19	1			
Attitude toward preventive behaviors	0.203	1		
Risk Perception of getting COVID-19	-0.022	.247*	1	
COVID-19 Preventive behaviors	-0.021	.512**	-0.111	1
**Correlation is Significant at the 0.01 *Correlation is Significant at the 0.05				

Results from the generalized linear model in dedicated that Attitude preventive behavior (Beta=.622, p<0.01) had a statistically significant effect on the preventive behavior adopted

Table 3: Generalized linear model predicting preventive behaviors of Knowledge, Attitude and COVID-19 Preventive Behavior for the 4th wave

	B	SE	EXP (β)	Sig (p)	95% CI	
					Lower	Upper
Gender	-0.86	1.82	-0.051	0.638	-4.491	2.77
Grade Level	0.21	1.075	0.021	0.846	-1.934	2.355
No.Family member < 18	-0.796	1.996	-0.046	0.701	-4.749	3.211
No.Family member > 18	-8.471	7.46	-0.112	0.26	-23.35	6.408
No.Family got vaccinated	2.079	2.174	0.113	0.342	-2.258	6.416
Parent occupation	0.407	0.873	0.051	0.642	-1.333	2.148
Knowledge about COVID-19	-0.517	0.46	-0.117	0.265	-1.436	0.401
Attitude toward preventive behaviors	2.212	0.374	0.622	0	1.467	2.958
Risk Perception of getting COVID-19	-1.095	0.417	-0.266	0.011	-1.927	-0.262

5. DISCUSSION

Students in this school didn't really interface with Covid-19 and they are also very busy with their studying, especially grade 12 so they didn't get into the news much. It came out by score that their knowledge was at a medium level. Still their attitude was very good because of their lack of knowledge so they needed to listen to their guardian and follow the instruction. On the other hand, there is always a lack of awareness because of the lack of knowledge. So their score of preventive behavior came out on the medium level. Table 1 showed that all the categories of girls had a greater score than boys but it turned out that boys had better preventive behavior. It might be because boys have more responsibility than girls but their attitude was against society to show off. Also the level of behavior was related to how much they put attention on it so grade 10 turned out having the highest score on preventive behavior. The Table1 showed that families where their parents were working in the group of business owners had the highest score in preventive behavior because they were the group that had time to stay with their children and teach them the right knowledge. The result of the research probably showed that Attitude toward preventive behaviors was the most significant factor that affected the COVID-19 Preventive behavior which was in the same direction or directly proportional . As table 1 most of the Sociodemographic characteristics were shown to be in that way. Shown by table 1 that the category in each group (Grade Level, No.Family member under 18, No.Family got vaccinated,Parent occupation) which have the highest score in Attitude toward preventive behaviors also have a highest score in COVID-19 Preventive behavior.

Due to the conclusion that the most important factor that affected COVID-19 Preventive behavior is supported by Knowledge, attitudes and preventive behaviors toward COVID-19: a study among higher education students in Portugal that illustrates the significance of the proportion of Attitude toward preventive behaviors to COVID-19 Preventive behavior[3].

Students revealed good knowledge about COVID-19, correctly answering 13.06 (SD = 1.25) questions in a total of 14 and favorable attitudes toward preventive behaviors (M = 32.73, SD = 2.88). Students reported always engaging in, on average, 5.81 (SD = 2.61) of the 12 behaviors analyzed. Females presented higher levels of knowledge, more positive attitudes and engaged in more preventive behaviors than males. Being a bachelor's (Exp (β) = 8.213, 95% CI: 1.791–37.670, $p < 0.01$) or a master's degree student (Exp (β) = 7.568, 95% CI: 1.598–35.835, $p < 0.05$) and having positive attitudes toward preventive behavior of COVID-19 predicted the adoption of those preventive behavior (Exp (β) = 1.340, 95% CI: 1.189–1.510, $p < 0.001$). And as Knowledge, Attitudes, and Safety Practices About COVID-19 Among High School Students in Iran During the First Wave of the Pandemic [4] found that More than 90% of students knew about the cause of the disease, the routes of transmission, and the most renowned symptoms: dyspnea and cough. Social-and-audiovisual-media were the leading information source. Most students believed that people need to keep safe physical distance, everyone should isolate themselves upon symptom onset, people should avoid unnecessary in-person contact with family and friends, and that cities need to go under lockdowns if needed. Students' mean (SD) practice score was 20.2 (2.5) of 24. Most students did not go on a trip, and more than 80% said they would wear facemasks when going outside. Knowledge, attitudes, and preventive behaviors toward coronavirus disease-19: A study among high school students in Bangkok [5] had out came the results of the research that Students revealed good knowledge about COVID-19, correctly answering 5.22 (SD = 1.57) questions in a total of 7, good attitudes toward preventive behaviors in the presence of rules 9.06 (SD = 2.12) and good attitudes toward preventive behaviors without the presence of rules 9.48 (SD = 2.36), and good preventive behavior 33.91 (SD = 6.06), question in a total of 47. There are statistically significant positive correlations shown: between attitudes toward preventive behaviors with the presence of rules and preventive behaviors (Exp (B) = 0.521, 95% confidence interval [CI]: 0.0–0.99, P < 0.05) and between attitude toward preventive behavior without the presence of rules and preventive behaviors (Exp(B) = 0.584, 95% CI: 0.14–1.02, P < 0.05.

Limitation

The research limitation was found in various parts. For example, collecting data by giving out the google form so the participant might use tools or the internet to help them find the correct answer. Risk perception is also a limitation for this research because it leads participants to an unawareness of Covid-19 preventive behavior.

6. CONCLUSION

This research has a total participant of 80 people. The result indicated that this group of participants have a moderate level of knowledge of Covid-19, a high level of Attitude toward preventive behaviors, and a moderate level of Risk Perception of getting COVID-19. The result illustrates that the most effective factor was Attitude toward preventive behaviors which means the development of the Attitude toward preventive behaviors would increase the effectiveness of COVID-19 Preventive behavior. Finally, this research recommends guardians of these participants to encourage a better attitude toward covid preventive behavior by demonstrating the effect of COVID-19 to human health every week.

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