Research Article

Knowledge, awareness, and attitude regarding infection prevention and control among the undergraduate students in public universities in Bangkok, Thailand

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ABSTRACT

Background: Chain of infection is a process of infection when specific conditions must be reached for microorganisms to spread from a reservoir to a susceptible host. To break the chain of infection, one of the processes must be interrupted. According to my current situation, people around the globe are facing a pandemic (coronavirus disease [COVID-19]). Therefore, it is crucial for the young pupils in the universities to have a competent awareness about infection prevention to prevent and protect themselves from any further spreading of diseases, including COVID-19. **Objectives:** This study aims to understand, recognize the factors that affect people's behavior and evaluate the knowledge, awareness, and attitude of undergraduate students to help to improve their practices on infection and prevention control. **Materials and Methods:** The study was conducted using a questionnaire. A total of 400 undergraduate students studying in public universities in Bangkok participated. Infection and prevention control-related knowledge, attitudes toward following infection prevention guidelines, attitude toward environmental support, and preventive behaviors were given. Differences between outcomes and sociodemographic were analyzed through independent *t*-test and the ANOVA. In addition, preventive behaviors were analyzed by a generalized linear model. No human and animals samples have been used in this study; therefore, ethics approval has not been necessitated. **Results:** The undergraduate students showed a good level of knowledge in infection prevention, at 6.85 (standard deviation [SD] = 1.83) of nine questions. They also had a good level of attitude toward following infection prevention guidelines, at 42.22 (SD = 1.83) of 50 points. For attitude toward environmental support, the participants showed that they were at a good level, with being at 20.58 (SD = 2.85) of 25 points. However, in terms of preventive behavior, the respondents revealed a moderate level, at 34.07 (SD = 4.03) of 47 points. There is a statistically significant positive correlation between attitude toward preventive behavior and preventive behavior (r = 0.551**, $P = 0.01$) and attitude toward environment support and preventive behavior (r = 0.496**, $P = 0.01$). From a generalized linear model, knowledge about infection prevention (Exp (B) = 0.063, 95% confidence interval [CI]: 0.049–0.510, $P < 0.05$), attitude toward preventive behavior (Exp (B) = 0.451, 95% CI: 0.189–0.375, $P < 0.05$), and attitude toward environmental (Exp (B) = 0.346, 95% CI: 0.506–0.839, $P < 0.05$) support can predict the preventive behavior adoption. **Conclusion:** The students showed a good level of infection prevention knowledge, attitude toward following infection prevention, and attitude toward environmental support, only in preventive behavior at a moderate level.

KEY WORDS: Undergraduate Students; Infection Prevention; Bangkok; Thailand

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INTRODUCTION

This study intends to evaluate undergraduate students' knowledge, awareness, and attitude toward and the learning approaches to help improve their understanding. As some infectious diseases are highly contagious, it is essential to know how to prevent the transmission of diseases. Therefore,

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to avoid students being exposed to infectious pathogens, the chain of infection must be broken (APIC, www.ashnha.com, May 25, 2021).[1] Chain of infection is a process of disease when the specific conditions must be reached for microorganisms to spread and reproduce from reservoir to a susceptible host. To break the chain of infection is to interrupt any state of the chain, so the disease cannot be transmitted to another person. Infectious diseases are caused by microorganisms such as viruses, bacteria, fungi, and parasites (MayoClinic, www.mayoclinic.org, May 25, 2021).[2] These microorganisms can cause illness, such as fever, nasal congestion, sore throat, or change in cough (MayoClinic, www.mayoclinic.org, May 25, 2021).[3] Although most of them are not transmissible, most of them can be transmitted through either direct or indirect contact, depending on the type of pathogen. Consequently, infectious diseases can be spread very rapidly from one person to another. Therefore, people in our country must have a good level of knowledge about infection prevention, attitude toward following infection prevention guidelines, attitude toward environmental support, and preventive behavior. This research is aiming to study a group of undergraduate students of public universities in Bangkok. Suppose the students do not have adequate knowledge, awareness, and practices about infection control. In that case, the contagious diseases could harm the students, detrimentally affecting society, public health organizations, and the government. For this reason, it is necessary to keep yourself and others safe, and it is vital to acknowledge infection prevention and control.

MATERIALS AND METHODS

This was a cross-sectional observational study. An online questionnaire was purposely developed and made available through Google Forms between May 23, 2021, and May 12, 2021. Undergraduate students in Bangkok, Thailand, were invited to participate in completing an online questionnaire. A total of 400 students participated. Infection control-related knowledge, attitudes toward infectious diseases, and preventive behaviors were assessed. All students enrolled in the academic year 2020/2021 in public universities in Bangkok, students in bachelor's degrees were eligible and were invited to participate in the study. The invitation was sent by email to the institutional emails used by the students. In these emails, 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. No human and animals samples have been used in this study; therefore, ethics approval has not been necessitated.

Instruments

The questionnaire was developed based on a literature review including (1) information provided by and guidelines from the Department of Health, Ministry of Public Health in Thailand regarding infection and prevention control. In addition, (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. The proposed items were then grouped, and redundant items were removed. A preliminary version of the instrument was reviewed by two infection control specialists of a public hospital in Thailand to validate its content. A pre-test was then performed with a small sample of higher education students to test for comprehension and difficulty. All the questions remained without modifications. Finally, the psychometric characteristics of the questionnaires were tested, as described in the statistical analysis subsection. The final version of the questionnaire contained 40 questions; the first five questions about sociodemographic data (age, sex, educational level, scientific area, and personal monthly income) and 35 items were divided into four sections.

Infection and Prevention Control-related Knowledge

This section consisted of nine questions related to the basic knowledge of infection and prevention control. The participants were asked to choose only one correct answer for choices (A, B, C, and D). 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 corresponding to a higher level of knowledge. The score varies from 0 to 9, ≥7.2 as a good level, >5.4 but <7.2 as a moderate level, and <5.4 as a poor level.

Attitude and Behavior toward Infection and Prevention Control

This section comprised 10 questions, and the response categories consisted of a 5-point Likert scale (1 for never, 2 for hardly, 3 for sometimes, 4 for usually, and 5 for always) with the highest score corresponding to more positive attitudes toward preventive behaviors. The participants were asked to choose the number based on their practices and honestly. A sum of all the items within each factor was made to obtain a score. The "Attitudes toward preventive behaviors" varied from 1 to 50, ≥40 as a good level, >30 but <40 as a moderate level, and <30 as a poor level.

Environment and Behavior toward Infection and Prevention Control

This scale included five questions related to environment and behavior correlations. The students were asked to choose the number for each question (1 for never, 2 for hardly, 3 for sometimes, 4 for usually, and 5 for always). The number of behaviors practiced was added up. A high score on this scale indicated a good correlation between behaviors and environment, ranging from 1 to 25, with ≥20 as a good level, >15 but <20 as a moderate level, and <15 a poor level.

Preventive Behavior

This scale referred to the number of preventive behaviors adopted and included 10 questions (personal protective equipment, physical distance, hand washing, disinfection, and exercise routines). Each item was answered using a 5-point scale (From 1 – Never to 5 – Always), with 1 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 1 to 47, with ≥37.6 as a good level, >28.2 but <37.6 as a moderate level, and <28.2 as a poor level.

Statistical analysis

The analysis was performed using IBM Statistical Package for the Social Sciences Statistics for Windows, version 26.0, Armonk, NY, USA. To analyze the psychometric of infection and prevention control: Personal factors, knowledge, attitudes, environment, and behaviors characteristics of the scales, an exploratory factor analysis, using principal component analysis with varimax rotation, was carried out. The descriptive studies were presented in absolute (n) and relative (%) frequencies, mean (M), and standard deviations (SD). To assess the differences between the outcome variables (personal factors, knowledge, attitudes, environment, and behaviors toward infection and prevention control) and the sociodemographic characteristics, considering the sample size, independent t-tests and the ANOVA were used, as appropriate. Pearson's correlation calculated the correlations between the outcomes of the study. Finally, a generalized linear model was calculated to determine the predictive variables of the preventive behaviors. Exp (β) and the respective 95% confidence intervals (95% CI) were presented. Statistical significance was defined as $P < 0.05$.

RESULTS

This study comprised a total of 400 university students. The sociodemographic characteristics of the sample are presented in Table 1. Most of the participants were female (n = 259, 64.8%) and male (n = 141, 35.3%) Most of the participants' ages were 19–20 years of age (n = 196, 49.0%), and the least were 17–18 years of age (n = 40, 10.0%). In terms of year level, most participants were in year level of 2 (n = 127, 31.8%). Year 3 and 4 have similar numbers (n = 64, 16.0% and n = 72, 18.0%). The minority of the participants in year 5, at only 21 responses, accounted for 5.3%. In faculty matters, 89 responses (22.3%) were from business-related faculty, which are the majority of the respondents. The numbers of science and health science participants were relatively close at 70 (17.5%) and 64 (16.0%), respectively. Education has the least number of respondents, at only 17 (4.3%). For income, most of the participants earned 5000–10,000 baht a month (n = 161, 40.3%) and 10,000–20,000 baht a month (n = 140, 35%). For below 5000, 37 (9.3%) of the participants come from the group. Finally, for the group that earned more than 20,000 a month, 62 (15.5%) responses were from this group [Table 1].

Students revealed a moderate level of knowledge about infection prevention, correctly answering a mean of 6.85 (SD = 1.83) questions in a total of 9. There were differences in the level of knowledge according to the faculty. Students who study science and technology, health science and science showed higher levels of knowledge compared to other faculties, while the lowest goes to business at 6.26 (SD = 1.95). Looking more precisely at each question, it was found that the top three questions that the participants answered correctly were (1) How infectious diseases such as influenza spread? (2) Which of these choices is the way to reduce genital herpes or other communicable sexual diseases? and (3) Which type of pathogen causes ringworm disease? More than 80% of the participants answered correctly. In contrast, the respondents incorrectly answered the top three questions: (1) Which one of these is a viral disease? (2) During coronavirus disease (COVID-19) situation, what is the appropriate distance to be away from other people? and (3) How to prevent ringworm disease? Over 40.4%, 38.7%, and 29.7% of the participants answered the question (1), (2), and (3), incorrectly [Table 2].

Regarding attitudes toward following infection prevention, the table shows that most of the participants have a good level of attitude toward infection prevention and control at 42.22 (S.D. = 1.83). Although most of the participants were in a good range in the science faculty, the mean for this section is at 39.59 (S.D. = 7.25), which is in a moderate range. To be more precise, it was discovered that the top three questions that the participants chose "always" as their choice the most were as follows: (1) Wearing a surgical mask during a pandemic situation and in hospitals, (2) using your own toothbrush, comb, or razor blade, and (3) always take antibiotics only when prescribed. The percentages were 63%, 58.9%, and 51.1%, accordingly. While the top three questions that participants chose "always" the least were as follows: (1) Always having a hand sanitizer in your bag. (2) Having your own serving spoon while having a collective meal. (3) Wash your hands with soap for at least 20 s before and after using the toilet. The percentages were 41.4%, 33.9%, and 26.9%, accordingly [Table 3].

Moving on to environmental support, the mean for this part was at 20.58 (S.D. = 2.85) with five questions. According to the table, almost all of the undergraduate students were in a good range while only the group that earned above 20,000 baht a month was in a moderate range 19.69 (S.D. = 2.97). Little more detail, Table 4 shows us that this question (would you wash your hands more often if alcohol gels are provided in public areas?) has the highest "always" response percentage, at 51.4%. The lowest "always" response percentage goes to this question (would you take a free condom that is provided by public health?), at 31.7% [Table 4].

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

Sociodemographic characteristic	*n* (%)	Infection prevention knowledge range 0–9)		Attitude toward following infection prevention guideline (range 1–50)		Attitude toward environmental support (range 1–25)		Preventive behavior (range 1–47)	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age		6.85	1.83	42.22	1.83	20.58	2.85	34.07	4.03
17–18	40 (10.0)	6.65	1.93	42.58	4.30	20.60	2.51	33.78	3.13
19–20	196 (49.0)	6.99	1.71	41.44	5.63	20.51	3.00	33.65	4.20
21–22	97 (24.3)	6.67	1.88	43.03	4.43	20.70	2.48	34.77	3.86
Above 23	67 (16.8)	6.81	2.01	43.10	3.98	20.58	3.15	34.48	4.14
Gender									
Male	141 (35.3)	6.65	1.97	40.54	5.43	20.31	2.76	33.80	4.01
Female	259 (64.8)	6.96	1.74	43.13	4.55	20.72	2.89	34.22	4.04
Year level									
1	88 (22.0)	6.77	1.48	42.31	4.84	20.25	2.70	33.18	4.03
2	127 (31.8)	7.04	1.94	41.09	6.03	20.89	2.80	34.21	4.03
3	64 (16.0)	6.64	1.83	42.39	4.34	20.25	3.30	33.64	4.48
4	72 (18.0)	6.65	1.93	43.94	3.62	20.46	2.70	34.90	3.70
5	21 (5.3)	6.48	2.09	42.19	5.17	20.52	3.20	34.95	4.71
6	28 (7.0)	7.54	1.69	42.25	4.01	21.25	2.50	34.43	2.64
Faculty									
Education	17 (4.3)	6.65	1.77	42.59	3.64	21.18	2.19	34.41	3.54
Business	89 (22.3)	6.26	1.95	43.75	3.73	20.67	2.61	35.07	3.55
Language	48 (12.0)	6.69	1.86	40.96	5.30	20.52	2.67	34.25	3.58
Science	70 (17.5)	7.21	1.51	39.59	7.25	20.03	2.99	33.31	4.86
Science and tech	31 (7.8)	7.58	1.52	42.23	5.02	20.52	2.67	33.90	3.52
Health science	64 (16.0)	7.52	1.76	43.48	3.50	20.81	3.46	34.19	4.31
Arts	45 (11.3)	6.44	1.80	43.38	3.50	20.76	2.85	33.60	3.93
Social science	36 (9.0)	6.61	1.87	41.33	4.11	20.58	2.70	33.22	3.99
Income									
Below 5000	37 (9.3)	6.43	1.63	41.73	4.98	21.03	2.70	32.65	3.78
5000–10,000	161 (40.3)	6.83	1.99	42.35	5.07	20.88	2.70	34.55	3.66
10,000–20,000	140 (35.0)	6.89	1.68	41.89	5.14	20.50	2.94	33.99	4.29
Above 20,000	62 (15.5)	7.06	1.80	42.90	4.71	19.69	2.97	33.89	4.33

Finally, in the preventive behavior section, every group of participants was at a moderate level, at the mean of 34.07 (S.D. = 4.03). In addition, it was seen that the top three questions that the participants chose "always" as their choice the most were as follows: (1) I do not use my personal belongings with other people such as towels, (2) I wash my hands many times a day, and (3) I wash my hands with soap when I sneezed or after using toilets. The percentages were 55.1%, 52.9%, and 51.6%, accordingly. In contrast, the top three questions that the respondents chose "always" the least were as follows: (1) I wash my hands after touching doorknobs, (2) I keep my social distance from other people while I am in public areas, and (3) I exercise and rest appropriately. The figures were 38.2%, 33.4%, and 28.9%, accordingly [Table 5].

The analysis of the correlations between the outcomes of the study – knowledge, attitudes, and attitudes toward environmental support – revealed the existence of positive and statistically significant correlations between the attitude toward prevention guideline and the infection preventive behavior (r = 551**, $P < 0.01$) and the attitude toward environmental support and the infection preventive behavior (r = 0.496**, $P < 0.01$). The attitude toward following infection prevention guidelines was also intercorrelated with the attitude toward environmental support [Table 6].

Results from the generalized linear model indicated that the attitude toward following infection prevention guidelines and environmental support had a statistically significant effect on the infection preventive behaviors adopted. Therefore, having a positive attitude toward environmental support (beta = 0.489, $P < 0.05$) and a positive attitude toward following infection prevention guidelines (beta = 0.361, $P < 0.05$)

Table 2: Frequency and percentage on level of knowledge infection prevention of the participants (*n*=400)

Question items about infection prevention-related knowledge	Correct answered, *n* (%)
How infectious diseases such as influenza spread?	348 (84.8)
Which of these choices are the way to reduce genital herpes or other communicable sexual diseases?	338 (84.3)
What is the best way to prevent serious viral diseases?	314 (78.3)
How to treat a bacterial infection?	322 (80.3)
During COVID-19 situation, what is the appropriate distance to be away from other people?	246 (61.3)
Which of these statements were not the method to prevent infection through droplets?	330 (82.3)
Which type of pathogen causes ringworm disease?	335 (83.5)
How to prevent ringworms disease?	282 (70.3)
Which one of these is a viral disease?	239 (59.6)

predicted the adoption of those infection preventive behaviors [Table 7].

DISCUSSION

The participants had a good level of knowledge about infection prevention. This may be because the participants are students of competitive universities; many students competed to get into this university, so all the intelligent students were there (Webometric University Ranking, http://web.sut.ac.th, May 28, 2021). The result shows that most students answer the questions correctly about how influenza spread and understand how to prevent droplets. This may occur because while collecting data it was the COVID-19 pandemic period, knowledge regarding COVID-19 prevention being educated widely (Department of Disease Control, https://ddc.moph.go.th, May 28, 2021).

From Table 1, 41% of the participants study in science faculties, showing evidence of what is being taught in those subjects – especially health science, science students who had an apparent good level of knowledge about infection control. For example, Taylor *et al*. (2010)[3] studied hand hygiene knowledge of college students in Alabama, U.S.A., found that science majors were more likely to wash their hands than non-science majors. In contrast, with Sultana *et al*. (2015)[4] that studied hand hygiene knowledge and practice among university students in Bangladesh, hand hygiene awareness and compliance among university students were relatively low.

Attitude toward following infection prevention guidelines, most participants had a good attitude toward following

Table 3: Frequency and percentage on level of attitude toward infection prevention of the participants (*n*=400)

Question items about attitude toward preventive behavior	Always	Usually	Sometimes	Rarely	Never
Always have a hand sanitizer in your bag.	116 (41.4)	135 (33.7)	65 (16.2)	21 (5.2)	14 (3.5)
Washing your hands with soap for at least 20 s before and after using toilets	108 (26.9)	168 (41.9)	84 (20.9)	33 (8.2)	8 (2)
Having your own serving spoon, while having a collective meal.	136 (33.9)	139 (34.7)	79 (19.7)	38 (9.5)	9 (2.2)
Always eating well cooked food and drinking water from a known source.	211 (52.6)	131 (32.7)	46 (11.5)	12 (3)	1 (0.2)
Keep counters and other kitchen surfaces clean when preparing meals.	146 (36.4)	159 (39.7)	67 (16.7)	25 (6.2)	4 (1)
Wearing a surgical mask during a pandemic situation.	256 (63.8)	109 (27.2)	32 (8)	4 (1)	0
Do not go to work if you are sick.	195 (48.6)	149 (37.2)	43 (10.7)	13 (3.2)	1 (0.2)
Using your own toothbrush, comb, or razor blade	205 (51.1)	156 (38.9)	33 (8.2)	6 (1.5)	1 (0.2)
Wash hands before and after a meal	196 (48.9)	152 (37.9)	45 (11.2)	6 (1.5)	2 (0.5)
Using your own toothbrush, comb, or razor blade	236 (58.9)	137 (34.2)	20 (5.0)	6 (1.5)	2 (0.5)

infection prevention guidelines. This is because being in a public university in Bangkok is relatively competitive, the students' intelligence level was quite high compared to other parts. Most of the students had a good understanding of infection prevention. There are some relations between knowledge and attitude. The study from Cherry (2021)[5] about attitudes and behavior in psychology stated that classical conditioning, operant conditioning, and observational learning could be used to bring about attitude change. Classical conditioning can create positive emotional reactions to an object, person, or event by associating positive feelings with the target object. Operant conditioning can be used to strengthen desirable attitudes and weaken undesirable ones. People can also change their attitudes after observing the behavior of others. Another evidence on the relation between

Table 4: Frequency and percentage on level of attitude toward environment support infection prevention of the participants (*n*=400)

Question items about attitude toward environment support	Always	Usually	Sometimes	Rarely	Never
Would you use a personal serving spoon in restaurants if it is provided?	202 (50.4)	117 (29.2)	53 (13.2)	11 (2.7)	18 (4.5)
Would you wash your hands more often if alcohol gels are provided in public areas?	206 (51.4)	158 (39.4)	31 (7.7)	4 (1.0)	2 (0.5)
Would you take a free condom that is provided by public health?	127 (31.7)	124 (30.9)	75 (18.7)	21 (5.2)	54 (13.5)
Do you concern yourself more with disease prevention when you are at hospitals than you are at your campus?	163 (40.6)	157 (39.2)	58 (14.5)	13 (3.2)	10 (2.5)
Do you think your parents can influence you to have good hygiene practices?	170 (42.4)	171 (42.6)	53 (13.2)	4 (1)	3 (0.7)

knowledge and attitude, Mbroh (2019)[6] conducted a study about assessing knowledge, attitude, and practices of hand 2019 hygiene among university students in Minnesota State University in Mankato found that both levels of knowledge and attitude about hand hygiene were in good level still there were gaps in their knowledge, attitude, and practices. Once being educated or trained to increase the level of knowledge and understanding, humans have a tendency to follow what they know. Glomjai *et al*. (2020)[7] studied the knowledge and behavior of people regarding self-care prevention from novel coronavirus 2019 found that the participant had a good level of knowledge about COVID-19 and had good preventive behavior against COVID-19.

Most of the participants engaged in favorable environment support; it can be explained by environmental behavior. Putri *et al*. (2017)[8] studied environmental factors, knowledge, and hygiene behavior among mothers: A slum area in Bandung city, West Java, Indonesia, had. They concluded in 2017 that environmental factors of the respondents based on hygiene behavior show a significant difference between respondents who have good and poor environmental factors. The findings are consistent with the theory of the Integrated Behavior

Table 5: Frequency and percentage on infection prevention behavior of the participants (*n*=400)

Question items about infection prevention behavior	Always	Usually	Sometimes	Rarely	Never
I only go out when it is necessary	193 (48.1)	147 (36.7)	52 (13)	8 (2)	1 (0.2)
I keep my social distance with other people while I am in public areas	134 (33.4)	183 (45.6)	69 (17.2)	12 (3.0)	3 (0.7)
I only use public transport when it is necessary	188 (46.9)	154 (38.4)	36 (9)	16 (4)	7 (1.7)
I wash my hands many times a day	212 (52.9)	137 (34.2)	47 (11.7)	5 (1.2)	0
I wash my hands every time before a meal	195 (48.6)	152 (37.9)	42 (10.5)	9 (2.2)	3 (0.7)
I wash my hands with soap when I sneeze or after using toilets	207 (51.6)	144 (35.9)	44 (11)	5 (1.2)	1 (0.2)
I wash my hands after touching door knobs	153 (38.2)	169 (42.1)	62 (15.5)	13 (3.2)	4 (1.0)
I avoid touching my face as much as possible	176 (43.9)	153 (38.2)	62 (15.5)	8 (2.0)	2 (0.5)
I do not use my personal belongings with other people such as towels	221 (55.1)	150 (37.4)	24 (6.0)	5 (1.2)	0
I always consume well cooked food and use a personal serving spoon.	178 (44.4)	172 (42.9)	39 (9.7)	6 (1.5)	5 (1.2)
I exercise and rest appropriately	116 (28.9)	168 (41.9)	82 (20.4)	27 (6.7)	7 (1.7)

Model, which states the environment as a determining factor of individual hygiene behavior. In addition, Pradhan *et al*. (2020)[9] conducted research about school-based interventions to promote personal and environmental hygiene practices among children in Pakistan: Protocol for a mixed methods study stated that improving personal and environmental hygiene among primary schoolchildren offers an opportunity to design and test various behavioral change strategies at school and in-home settings. The study findings will be significant in assessing the intervention's effectiveness in improving children's overall hygiene.

Table 6: Pearson's correlation coefficient between the study outcomes

Variable	Knowledge about infection prevention	Attitude toward following infection prevention guideline	Attitude toward environmental support	Preventive behavior
Knowledge about infection prevention	1			
Attitude toward following infection prevention guideline	0.003	1		
Attitude toward environmental support	0.006	0.343**	1	
Preventive behavior	0.051	0.551**	0.496**	1
**Correlation is significant at 0.01				

Table 7: Generalized linear model predicting behaviors

Generalized linear model predicting behaviors	B	SE	Beta	Sig.	Confidence interval	
					L	U
Intercept	6.747	3.415	-	0.050	0.009	13.485
Knowledge about infection prevention	0.280	0.117	0.063	0.018	0.049	0.510
Attitude toward following infection prevention guideline	0.282	0.047	.451	0.000	0.189	0.375
Attitude toward environmental support	0.672	0.084	.346	0.000	0.506	0.839

Most of the participants showed a good level of infection prevention behavior; this may be due to the fact that most of the participants are studying for a bachelor's degree, which would give them knowledge about infection prevention control. In addition, the study from Glomjai *et al*. (2020)[7] about the knowledge and behavior of people regarding self-care prevention from novel coronavirus 2019 (COVID-19) showed that education is a factor that influences infection prevention behavior.

Limitation

The questionnaire was given to the students during a COVID-19 pandemic period. Therefore, it was difficult for me to spread out the questionnaire manually. Hence, the questionnaire could not be hard copied. This results in the usage of Google Forms. Google Forms are only available for those people that have access to the internet and smartphone. Therefore, the group that does not have the key was not reached during the data collecting period. For the knowledge toward infection and prevention part, the questions required some scientific knowledge. Some of the participants could search the questions that they were struggling with on the internet.

CONCLUSION

The students showed a good level of infection prevention knowledge, attitude toward following infection prevention, and attitude toward environmental support, only in preventive behavior at a moderate level. However, it has been found that there is a causal relationship between attitudes toward following infection prevention guidelines, attitude toward environmental support, and preventive behaviors. Therefore, to improve the level of preventive behavior to a good level, attitudes toward following infection prevention guidelines and attitude toward environmental support are major predictive factors in good preventive behaviors. Therefore, to promote preventive behaviors, accurate knowledge, attitude, and environmental support about infection prevention control should be given consistently by the universities. Furthermore, to build up the same positive preventive behavior as in this research, teachers and staff should show a sense of trust to students since this may form preventive behaviors in students.

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