ปัจจัยทำนายพฤติกรรมการป้องกันโรคติดเชื้อไวรัสโคโรนา 2019 ของเด็กวัยเรียนในภาคตะวันออก
Predictors of Preventive Behaviors for Coronavirus Disease 2019 among School-age Children in the Eastern Region of Thailand

นิพนธ์ต้นฉบับ

นาดยา แสงใส*, ณัชนันท์ ชีวานนท์ และ วณิตา ขวัญสำราญ

คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา อ.เมือง จ.ชลบุรี 20131

* Corresponding author: nattayas@buu.ac.th

วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2567;19(2):117-124.

Original Article

Nattaya Sangsai*, Natchanan Chivanon and Wanita Kwansumran

Faculty of Nursing, Burapha University, Mueang, Chonburi, 20131, Thailand

* Corresponding author: nattayas@buu.ac.th

Thai Pharmaceutical and Health Science Journal 2024;19(2):117-124.

บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาพฤติกรรมการป้องกันโรคติดเชื้อไวรัสโคโรนา 2019 และอิทธิพลของปัจจัยนำ ปัจจัยเอื้อ และปัจจัยเสริมตามแบบจำลองการวางแผนส่งเสริมสุขภาพ (PRECEDE-PROCEED MODEL) ต่อพฤติกรรมป้องกันโรคติดเชื้อไวรัสโคโรนา 2019 ของเด็กวัยเรียน **วิธีการศึกษา:** กลุ่มตัวอย่างเป็นเด็กวัยเรียนในภาคตะวันออก ช่วงการระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 ระหว่างเดือนธันวาคม 2564 ถึงมีนาคม 2565 จากการสุ่มแบบหลายขั้นตอนจำนวน 250 คน เครื่องมือเป็นแบบสอบถามพฤติกรรมการป้องกันโรคติดเชื้อไวรัสโคโรนา 2019 และปัจจัยที่อาจมีอิทธิพล วิเคราะห์ข้อมูลด้วยสถิติถดถอยพหุคูณแบบขั้นตอน **ผลการศึกษา:** กลุ่มตัวอย่างมีพฤติกรรมการป้องกันโรคติดเชื้อไวรัสโคโรนา 2019 ในระดับมาก (mean = 51.43, SD = 12.80) ซึ่งการรับรู้สมรรถนะในการป้องกันโรคติดเชื้อไวรัสโคโรนา 2019 (β = 0.330, P-value < 0.001) ทัศนคติต่อมาตรการป้องกันโรคติดเชื้อไวรัสโคโรนา 2019 **(β = - 0.310, P-value < 0.05)** และการเข้าถึงบริการสุขภาพ (β = 0.262, P-value < 0.05) เป็นปัจจัยที่มีนัยสำคัญทางสถิติที่ร่วมทำนายพฤติกรรมการป้องกันโรคติดเชื้อโคโรนา 2019 ได้ร้อยละ **21.6 (R² = 0 .216, P-value < 0.05) สรุป:** พฤติกรรมการป้องกันโรคติดเชื้อไวรัสโคโรนา 2019 สัมพันธ์กับการรับรู้สมรรถนะในการป้องกันโรค ทัศนคติต่อมาตรการป้องกันโรค และการเข้าถึงบริการสุขภาพ การพัฒนากิจกรรมเพื่อส่งเสริมพฤติกรรมป้องกันโรคติดเชื้อโคโรนา 2019 เด็กวัยเรียนควรเน้นกิจกรรมเสริมสร้างการรับรู้สมรรถนะแห่งตน ทัศนคติต่อมาตรการป้องกันโรค และการเข้าถึงบริการสุขภาพ

คำสำคัญ: โรคติดเชื้อไวรัสโคโรนา 2019; พฤติกรรมการป้องกันโรค; เด็กวัยเรียน; การรับรู้สมรรถนะในการป้องกันโรค; ทัศนคติต่อมาตรการป้องกันโรค; การเข้าถึงบริการสุขภาพ

Abstract

Objective: To study health behavior for COVID-19 prevention and the influence of predisposing, enabling, and reinforcing factors according to the PRECEDE-PROCEED MODEL on the behaviors among school age. **Method:** This predictive correlational study had 250 school age children's participants in the eastern region of Thailand during the COVID-19 pandemic from December 2021 to March 2022. Participants were selected through a multi-stage random sampling. The questionnaire assessed the behavior and influencing factors. Stepwise multiple linear regression was school age children to test the associations. **Results:** The participants had a high level of health behavior for COVID-19 prevention (mean = 51.43, SD = 12.80). Perceived self-efficacy in COVID-19 prevention (β = 0.330, P-value < 0.001), attitude towards COVID-19 preventive measures (β = - 0.310, P-value < 0.05), and access to health services (β = 0.216, P-value < 0.05) were statistically significant predictors and could predict the behavior by 21.6% (R^2 = 0.216, P-value < 0.05). **Conclusion:** COVID-19 prevention behavior was associated with perceived self-efficacy, attitude towards preventive measures, and access to health services. Preventive behaviors could be developed through activities to enhance perceived self-efficacy, positive attitudes, and access to health service.

Keywords: coronavirus disease 2019; preventive behaviors; school-age children; perceived self-efficacy in disease prevention; attitude toward preventive measures; access to health services

Journal website: http://ejournals.swu.ac.th/index.php/pharm/index

Introduction

The coronavirus disease of 2019 or Covid-19 is a new emerging disease rapidly pandemic worldwide. It can be found in every age group and affects many systems in the human body, especially the respiratory system as a life-threatening illness. World Health Organization announced this pandemic as a Public Health Emergency of Concern (PHEIC). Many people infected and died due to the worldwide spreading pandemic. The mutation of the virus makes it more virulent, hence a higher mortality rate. On September 30, 2023, there was a cumulative number of 622,370,893 Covid-19 patients and 6,547,074 deaths worldwide. In Thailand, the number of confirmed cases was 4,681,309 patients 32,746 deaths according to the Department of Disease Control (2022).[1] The data from December 31, 2021, to February 16, 2022, from the Department of Disease Control, Ministry of Public Health showed that cumulative infection among children under 18 years of age was 77,635 cases or 21% of the infection among all age groups. Even though Covid- 19 infection has been less

severe in children compared with adults. Covid-19 in children is relatively more asymptomatic than adults with usually only the upper respiratory infection signs and symptoms. Therefore, Covid-19 in children could be more contagious than adults.[2] The spread of the virus rapidly and widely from person to person via the droplets of phlegm, snot, and saliva when a patient coughs or sneezes. Those droplets fall onto the surrounding objects or surface. The mode of transmission is by touching the face, eyes, nose, or mouth. The infection can also be by directly breathing in the droplet when the patient coughs, sneezes, or exhales. On average, one patient can spread the virus to 2 - 4 people. About 80% of Covid-19 infected cases had few or no symptoms; while few cases had severe symptoms and complications.[3] At present, Covid-19 pandemic affects humans globally including public health, economics, society, and the environment, as well as the livelihood of all people regardless of demographic or socioeconomic differences.[4]

The eastern region of Thailand was categorized as the highest controlled area with the strictest measures including closing the risky places, closing the educational institutes, teaching via the online platform, limiting the travelling into the area, screening people travelling across the area, and establishing the field hospital. The eastern region of Thailand consists of important tourist attractions and industrial parks many Thais and foreigners travel across the area constantly allowing for a rapid spreading. Thus, situation of Covid-19 pandemic in the eastern Thailand was of grave concern.

School age is the stage of growing and developing in many ways. They are aged between 6 - 12 years old and able to manage and take care of themselves. They were ready to use their knowledge and rationale. They can understand and practice healthy behavior[5], and their parents are only an advisor. The Covid-19 pandemic affects the school-aged children. They had to stop studying and adapting to online classes. To reduce the effects on this age group[6], the Ministry of Education and related organizations had defined guideline for educational institutions to control and prevent Covid-19 by providing online classes according to the context of each area.[7] The pandemic affects the health and illness of the school-aged children and might interfere with their growth and development including physical, mental, emotional, and societal. If they are infected, they must be admitted to the hospital. Such separation from the parents could put stress on them and affect their intellectual and learning development.[8]

The problem of studying via online platforms is students cannot access the teaching efficiently. This could be in part because of the lack of financial support from the parents, knowledge, and skills in technology. The interaction between teacher and students is lacking, which affects the learning immensely for this age; as a result, required competencies were inferior compared with the onsite class. Online classes also affect students' health such as being overweight, fatigued, and stressed. [9,10] The Covid-19 pandemic affects many aspects including teaching, health status, adaptation, growth and development, and household finances. Nurses play an important role in providing knowledge, cultivating an attitude, teaching preventive behavior, and strengthening skills that create disease-prevention behaviors to create appropriate health behavior learning and healthy habits until they are adults.

Health behavior means an act or practice of an individual affecting health. Behavior modification is one of the efficient methods to prevent and control the severity of the disease. According to the guidelines for educational institutes to prevent and control the Covid-19, it is crucial to plan systematically. The concept of the PRECEDE-PROCEED MODEL by Green & Kreuter (2005)[11] has mentioned the individual behavior is caused by many factors such as Predisposing factors as a basic that allows the motivation to express the behaviors. Reinforcing factors, a factor that an individual has received from a person once he or she expresses the behavior. Enabling factors are a resource that is important for the individuals to express the desirable behavior. If the resource was easy to access, it would help to express such behavior more easily. Previous literature shows the factors associated with self-care behavior among school-aged children are knowledge and attitude associated with health care. It can jointly predict healthcare behavior among school-aged children in the Nakhon Si Thammarat Municipality area by 11.7% with statistical significance (P-value < 0.01).[12] In a study of factors associated with self-regulation to control asthma among school-aged children, social support, self-efficacy, and symptom recognition have a positive relationship with self-regulation among asthmatic school-aged children with statistical significance (P-value < 0.001).[13] However, the Covid-19 pandemic affected both learning and health status. Therefore, the school-aged children should have the correct knowledge and understanding to prevent the Covid-19. For academic and

healthcare practice, understanding associated factors on the preventive behavior of Covid-19 is thus crucial. Unfortunately, the influencing factors of Covid-19 preventive behavior have not been unclear. Hence, there was a need to determine the predictors of the Covid-19 preventive behaviors to promote and be able to prevent and control the severity of Covid-19 in school-aged children.

Conceptually, this present study was guided by the PRECEDE-PROCEED Model by Green & Kreuter (2005) and empirical evidence. Green & Kreuter mentioned about individual health behavior that, good or bad health behavior is caused by multiple factors. Therefore, behavioral modification of an individual should be started by analyzing the factors that cause the behavior including predisposing, enabling, and reinforcing factors. Healthcare practitioners could use educational ecological assessment to plan behavior modification specific to individuals. Predisposing factors in this present study including knowledge, beliefs, values, perceived benefits of behavioral practices or self-efficacy on health behavior practice could motivate behavior expression. This study considered the influence of knowledge on disease prevention, attitude toward disease prevention measures, confidence and trust in the nursing profession, perceived severity of disease, and self-efficacy on disease prevention. Enabling factors rely on the environment that directly influences behaviors, which might be supportive or prohibitive to the behavior both inside and outside the individuals. Enabling factors consisted of facilities, access to services, as well as supportive resources such as health facilities including health personnel. This study focused on the health services access during the pandemic. Lastly, reinforcing factors reflect how an individual perceived his or her behavior which would be supported or by others that have influence on the individual. It is an impulse to express health behavior continuously, such as the acceptance from family members and health personnel. Besides, reinforcing factors also affect the sustainability and persistence of behavior because it is associated with the mental components of an individual. This study determined mental health status, resilience, and social support on the Covid-19 preventive behavior.

Methods

This study was conducted using a predictive correlational design. The study population was school-aged children in nine provinces of the eastern region of Thailand including Chonburi, Chachoengsao, Rayong, Chanthaburi, Sa Kaeo, Nakhon Nayok, Prachinburi, Trat and Samut Prakan. To be eligible, they had to be between 6 - 12 years old, have no congenital disease, be Thai and able to communicate by listening, speaking, and reading Thai, and 4) be willing to participate in this study.

Since the topic has not been in this group of population, the sample size was estimated based on the medium effect size of 0.15 for a linear multiple regression.[14] With a type I error of 5%, a power of 95%, and 10 predictive factors, sample size of 173 participants was needed. To compensate for data incompletion, a 40% additional number of participants was needed[15] and a total of 250 participants were required.

With a multi-stage random sampling, five of nine provinces eastern region of Thailand were randomly selected. In each of the five selected provinces, one primary school under the Office of the Basic Education Commission was randomly selected. In each school, one classroom of each of grades 4, 5 and 6 was randomly selected. In each elected classroom, a simple random sampling was used to select the participants. A total of 16 – 17 students in each classroom or 50 individuals in each school were recruited.

Research instrument

The Instrument for data collection was a questionnaire which consisted of 12 parts. The first part collected demographic characteristics including sex, age, education level, household monthly income, number of residents, illness/congenital diseases, health facilities for healthcare services, and number of Covid-19 vaccinations.

Part 2 assessed knowledge of Covid-19 prevention. The questions were developed by the researcher based on literature. The 13 questions asked about signs and symptoms of infection and self-prevention from exposure to the virus. The response had 3 choices, i.e., true, false, and don't know, with a score of 1 point rewarded for the correct answer and 0 points otherwise. With the possible total scores of 0 - 13 points, level of knowledge was categorized as high, moderate and low (10.40 – 13, 7.81 - 10.39, and < 7.8 points, respectively).[16]

The third part assessed confidence and trust in the nursing profession. It was developed by Radwin and Cabral[17] based on the concept of trust. The researcher translated the questions into Thai.[18] The nine questions were related to confidence of service recipients towards the knowledge, skill,

and professional characteristics of nurses. The response was a 3-point rating scale ranging from 1-low, to 2-moderate and 3-high. With the possible total scores of 9 – 29 points, higher scores indicated a higher level of confidence and trust in the nursing profession. Levels of confidence and trust were categorized as low, moderate, and high (9.00 – 14.99, 15.00 – 20.99, and 21.00 – 27.00 points, respectively).

Part 4 assessed the attitude towards COVID-19 preventive measures. The questions were developed by the researcher guided by the literature. The 16 questions were related to the attitude of individuals toward virus exposure prevention measures. The response was a 4-point rating scale ranging from 0-strongly disagree, to 1-disagree, 2-agree, and 3-strongly agree. With the possible total scores of 0 – 48 points, higher scores indicated a more positive attitude, and the levels of positive attitude were categorized as low, moderate, and high (0.00 – 16.00, 16.01 – 32.01, and 32.02 – 48.00 points, respectively).

Part 5 assessed perceived Covid-19 severity. The questions were developed by the researcher based on literature. The five questions asked the participants to rate the effect of the infection on health status and social performance. The response was a 10-point rating scale ranging from 0-not at all to 10-absolutely. With the possible total scores of 0 – 50 points, levels of effects were categorized as low, moderate, and high (0 – 16.66, 16.67 – 33.33, to 33.34 – 50.00 points, respectively).

Part 6 evaluated perceived self-efficacy in Covid-19 prevention. The questions were developed by the researcher based on literature asking about confidence of an individual towards efficacy in Covid-19 prevention in all 6 aspects namely 1) self-healthcare, 2) hand washing, 3) wearing a face mask, 4) social distancing, 5) avoiding exposure to the virus, and 6) preventing virus spreading. The response was a 3-point rating scale ranging from 1-low confidence to 2-moderate confidence and 3-high confidence. With the possible total scores of 15 – 45 points, higher scores indicated a higher perception. Levels of self-efficacy were categorized as low, moderate, and high (15.00 – 25.00, 25.01 – 35.01, and 35.02 – 45.00 points, respectively).

Part 7 assessed perceived life strength. The questions were originally developed by Nintachan et al[19] based on the Resilience concept by Grotberg (1999). The 28 questions measured 3 components of life strength specifically external support sources promoting the life strength (9 questions),

internal strength (10 questions), and internal relationships (9 questions). The researcher adapted the questions to suit the school age. The number of questions decreased to 20. The response was a 5-point rating scale ranging from 1-strongy disagree, to 2-disagree, 3-neutral, 4-agree, and 5-strongly agree. With the possible total scores of 20 – 100 points, higher scores indicated a higher life strength level. Levels were categorized as low, moderate, and high (20.00 – 46.66, 46.67 – 73.33, and 73.34 – 100.00 points, respectively).

Part 8 assessed social support. The questions were developed from the concept of Schaefer, Coyne, and Lazarus[20] and translated into Thai by Lueboonthavatchai.[21] The 16 questions assessed the level of social support in 3 aspects including 1) emotional support, 2) information support, and 3) instrumental support. The response was a 5-point rating scale ranging from 1-lowest, to 2-low, 3-moderate, 4-high, and 5-highest. With the possible total scores of 16 - 80 points, levels of social support were categorized as low, moderate, and high (16.00 – 37.33, 37.34 – 58.66, and 58.67 – 80.00 points, respectively).

Part 9 assessed perceived access to the health services. The questions were developed by the researcher as guided by literature. The 15 questions evaluated the opinion of individuals toward access to health services during the pandemic with 5 components of the health service specifically 1) sufficiency of the existing service, 2) ability to access health facilities, 3) convenience during the service, 4) ability to pay for the service, and 5) acceptance of using the service. The response was a 5-point rating scale ranging from 1-lowest to 2-low, 3-moderate, 4-high, and 5-highest. With the possible total scores of 15 - 75 points, levels of access to health service were categorized as low, moderate, and high (15.00 – 35.00, 35.01 – 55.01, and 55.02 – 75.00 points, respectively).

Part 10 evaluated mental health using the General Health Questionnaire-28 (GHQ-28) of the Department of Mental Health, Ministry of Public Health of Thailand. This form was developed from the General Health Questionnaire (GHQ) by Grotberg[22] and translated into Thai.[23] The 28 questions assess 4 groups of psychiatric symptoms, specifically somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. The response had 4 options with 0 points rewarded for "better/more than usual/never" and "same/like usual/not more than usual" and 1 point for "worse/less than usual/somewhat more than usual" and "worse/less than usual/a lot more than usual." With the possible total scores of

0 - 28 points, the total score of 6 points or higher indicated having mental health problems.

Part 11 assessed perceived Covid-19 infection risk. The questions were developed by the researcher based on literature. The response was a 10-point rating scale ranging from 0=no risk to 10-highest risk. With the possible total scores of 0-10 points, higher scores indicated a higher perceived risk level.

Part 12 evaluated Covid-19 preventive behavior. The questions were developed by the researcher based on literature. The 24 questions assessed 6 aspects of disease prevention according to the Department of Disease Control, Ministry of Public Health during the pandemic including 1) healthcare, 2) hand washing, 3) wearing a face mask, 4) social distancing, 5) avoiding virus exposure, and 6) preventing virus spread. The response was a 4-point rating scale ranging from 0-never, to 1-occasionally, 2-sometimes, and 3-always. With the possible total scores of 0 - 72 points, levels of preventive behavior were categorized as low, moderate, and high (0.00 – 24.00, 24.01 – 48.01, 48.02 – 72.00 points, respectively).

Research instrument quality assurance

Content validity was tested by three experts in behavior science, nursing, and psychology and presented as the content validity index (CVI). Content validity of preventive knowledge on Covid-19, confidence and trust in nursing profession, attitude towards Covid-19 preventive measures, perceived Covid-19 severity, perceived self-efficacy in Covid-19 prevention, life strength, social support, access to health services, mental health, perceived Covid-19 infection risk, and preventive behavior of Covid-19 were at acceptable level with CVIs of 1.00, 0.81, 0.84, 0.84, 1.00, 1.00, 0.84, 0.90, 0.81, 1.00, and 0.96, respectively.

Internal consistency reliability was tested in 30 school-aged children in Chonburi province with characteristics comparable with the participants. The reliability of questions of preventive knowledge of Covid-19 (Part 2) was acceptable (Kuder-Richardson index of 0.70). The reliability of parts 3 – 12 was also acceptable (Cronbach's alpha coefficients of 0.71, 0.68, 0.78, 0.82, 0.83, 0.80, 0.81, 0.79, 0.78, and 0.81, respectively).

Ethical protection for participants

This study was approved by the Ethics Committee for Human Study of Burapha University (approval number: HU061/2563 (E1); approval date: September 14, 2020) . Permission from the directors of all study schools was obtained. The researcher provided prospective participants and all personnel responsible for these prospective participants with information about objective, process, and voluntary and credential nature of the study. Participants were informed that they could withdraw from the study at any time with no negative consequences in their health service and education. Written informed consent was obtained.

Data collection

The data was collected from December 2021 to March 2022. The researcher met the prospective participants to explain the details of the study as well as give them the explanatory documents and consent form for their parents to sign and bring it back to the researcher within the specified time. Once written informed consent from the parent was obtained, the researcher made an appointment with the student to complete the questionnaire. Since there were many questions, the homeroom teacher was assigned to read one question at a time to students, which took 50 - 60 minutes. Once done, the homeroom teacher inspected the completeness of the filled questionnaire.

Data Analysis

Descriptive statistics including frequency with percentage and mean with standard deviation were used to summary demographic characteristics and study variables. The association between Covid-19 behavior with all predictive variables was tested using stepwise multiple regression analysis. All statistical assumptions for multiple regression analysis were met. Statistical significance was set at a type I error of 5%. All statistical analyses were performed using the software program SPSS version 20 with the copyright of Faculty of Nursing, Burapha University.

Results

Of the 250 participants, all questionnaires were completed (100% response rate). The participants were with a mean age of 10.69 years (SD = 0.94). Majority of the participants were female (55.4%), lived with parents (89.5%), and healthy (95.6%). About one-third were vaccinated (30.4%) (with an average vaccination of 1.67 doses (SD = 0.46).

The Covid-19 preventive behavior was at a high level (Table 1) with a mean of 51.43 ± 12.80 out of 72 points. For

independent/predictive factors, those at the high level included confidence and trust in the nursing profession, perceived severity of Covid-19, and perceived self-efficacy in Covid-19 prevention, while the rest were at a moderate level. Mental health was at a normal level (Table 1).

Table 1 Levels of Covid-19 preventive behavior and all dependent variables (N = 250).

Factors	Possible range	Actual range	M	SD	Level
Knowledge for Covid-19 and its prevention	0 - 13	5 - 13	8.79	1.74	Moderate
Confidence and trust in the nursing profession	9 - 27	15 - 27	23.27	2.79	High
Attitude towards Covid-19 preventive measures	0 - 48	7 - 47	26.33	7.08	Moderate
Perceived severity of Covid-19	0 - 50	4 - 50	35.80	8.18	High
Perceived self-efficacy in Covid-19 prevention	15 - 45	19 - 45	35.94	4.25	High
Resilience	20 - 100	42 - 98	73.58	9.80	Moderate
Social support	16 - 80	24 - 80	58.51	10.34	Moderate
Access to health services	15 - 75	34 - 74	52.92	7.82	Moderate
Mental health status	0 - 28	1 - 9	4.13	1.35	Normal
Perceived risk of Covid-19 infection	0 - 10	2 - 9	9.12	2.60	Moderate
Preventive behavior of Covid-19	0 - 72	34 - 72	51.43	12.80	High

Once tested together, only perceived self-efficacy in Covid-19 prevention (P-value < 0.001), attitude towards Covid-19 preventive measures, and access to health services were significantly, positively associated with the preventive behavior (P-value < 0.001, = 0.004 and = 0.002, respectively) with 20.6% of its variance explained (adj. R^2 = 0.206, P-value < 0.05) (Table 2).

Table 2 Predicting factors on preventive behavior for Covid-19 among school-aged children (N = 250).

Factors	B	SE	β	t	P-value
Perceived self-efficacy in Covid-19 prevention	0.857	0.176	0.330	4.868	< 0.001
Attitude towards Covid-19 preventive measures	0.310	0.106	0.172	2.939	0.004
Access to health services	0.262	0.083	0.211	3.135	0.002

Constant= 13.492, R^2 = 0.216, adjusted R^2 = 0.206, F= 22.548, P-value < 0.05.

Discussion and Conclusion

The preventive behavior for Covid-19 among school-aged children in the eastern region of Thailand was at a high level. This can be because the participants could have received information of disease prevention method from their classes and all media disseminating the preventive measures from the Ministry of Education. The concept was linked with the prevention measures of the Center for Situation Administration of the Coronavirus Disease 2019 Outbreak. To promote the strength of protecting student health and safety, the 6 rules of conduct in the educational institute included screening body temperature, wearing a face mask, hand washing, social distancing, cleaning the classroom, reducing the congestion during each activity. A study of factors influencing preventive behavior for Covid-19 among senior high school students, Muang District, Chanthaburi Province showed that they had a preventive behavior for Covid-19 at a good level with statistical significance.[24] Also, a study of health literacy on wearing a face mask, washing hands to prevent the spread of germs, access to information and health services, and decision-making as preventive behaviors for Covid-19 among primary school students in Phetchaburi province showed that they had a preventive behavior at a high level.[25] Another study among school-aged children in Saudi Arabia also showed that the students had a high to highest level of self-preventive behavior and similar measure to prevent Covid-19.[26]

In this present study, it was found that 1) perceived self-efficacy in Covid-19 prevention, 2) attitude toward Covid-19 preventive measures and 3) access to health services could predict the preventive behavior for Covid-19 among school-aged children. Perceived self-efficacy in Covid-19 prevention is a predisposing factor in the PRECEDE-PROCEED MODEL conceptual framework that is associated with and can predict preventive behavior with statistical significance (β = 0.330, P-value < 0.001). Participants had perceived self-efficacy in Covid-19 prevention at a high level. This could be because perceived self-efficacy could lead to the confidence to practice the behavior. A person with perceived self-efficacy will make an effort and not give up until they succeed. The result was congruent with a study of factors associated with the self-regulation of students with asthma and found that students with perceived self-efficacy controlled their asthma with statistical significance (P-value < 0.01).[12] They can avoid the stimulating factor and use the needed tools for their illness. Furthermore, the study in Iran indicated that perceived self-efficacy is the best predictor (β = 0.59, P < 0.001) for social distancing and preventing themselves from Covid-19.[27] The persons who believe in their ability will clearly understand the guidelines. Together with the continuing practice, they will successfully meet their expectation. Therefore, the government should promote the measure to gain confidence among citizens and make them believe that they can prevent

themselves from disease efficiently via appropriate preventive behavior.

Attitude toward Covid-19 preventive measures was also a predisposing factor that influenced the preventive behavior for Covid-19 (β = 0.310, P-value < 0.05). Attitude and behavior is a process that is connected systematically. A person is supposed to have good knowledge that leads to a positive attitude that leads to good behavior and practice later. According to the study of factors associated with self-care behavior among school-aged children in Nakhon Sri Thammarat Municipality area, the attitude toward the preventive measure could predict self-care behavior by 11.7% with a statistical significance of 0.01.[11] Children at this age can receive health information from various channels whether television, or online, from parents, teachers, and health personnel. They can gain knowledge, understanding, and confidence toward the disease prevention of the government. Children already acknowledge the pandemic and the infection, and they strictly follow the given measures, since they know that it is a benefit for them and society as to control the disease spread. This is consistent with a study showing that attitudes toward the guidelines and measures for Covid-19 prevention promoted by the government on each age group in China resulted in the participants' willingness to work with related organizations to control the spread of the virus.[28]

Access to health services, an enabling factor, was found to have a significant relationship with the Covid-19 preventive behavior (β = 0.197, P-value < 0.05). The participants had a moderate level of access to the health service. During the pandemic, access to the health services was limited due to the preventive measure. However, people still were able to access the services they needed to maintain good health which is consistent with a study in sub-district health promoting hospitals.[29] It is also consistent with a study indicating that sufficient and modern medical tools as well as the atmosphere in the health facilities could influence the confidence of service recipient.[30] In case of illness, people access free services at the primary healthcare facilities. In addition, community pharmacy are available for highly convenient access for minor illnesses. Universal coverage allows most Thai to gain access to services for more severe illnesses including severe cases of Covid-19.[31]

Based on our findings and study conduct, nurses and healthcare providers could develop the Covid-19 prevention program to promote preventive behavior through enhancing perceived self-efficacy in Covid-19 prevention, attitude toward Covid-19 preventive measures, and access to health services. For education, ways to enhance perceived self-efficacy in Covid-19 prevention, attitude toward Covid-19 preventive measures, and access to health services should be taught and trained in nursing schools.

In conclusion, perceived self-efficacy in Covid-19 prevention, access to health services, and attitude toward Covid-19 preventive measures could predict the variance of the preventive behavior for Covid-19 by 21.6 percent%.

References

1. Department of Disease Control. Ministry of Public Health. Corona virus infection diseases 2019. (Accessed on Jun. 10, 2022, at https://ddc. moph.go.th/viralpneumonia/file/g_km/handout001_12032020.pdf) (in Thai)

2. Kriangburapa W. Coronavirus disease 2019 in children. Burapha J Med 2020;7(1):96-102. (in Thai)

3. The Centre for the Administration of the Situation due to the Outbreak of the Communicable Disease Coronavirus 2019 (COVID-19). COVID-19 situation for February 20, 2021. 2021. (Accessed on Jul. 11, 2022, at https://www.moicovid.com/) (in Thai)

4. Tossawut T, Mahiwan P,. The development of social quality of life of people and the development of social quality of life of People and the prevention of spreading of coronavirus infection disease (Covid 19). J Maha Chulalongkorn Univ Nakhondhat 2020;7(9):41-55. (in Thai)

5. Hockenberry MJ, Wilson D, Wong DL, Wong S. Essentials of pediatric nursing 9th ed. St. Louis. Elsevier/Mosby, 2013.

6. Hyde Z. COVID-19, children and schools: overlooked and at risk. Med J Australia 2020;213:(10)444-448.

7. Department of Health. Ministry of Public Health. Practical guide for schools in preventing the spread of COVID-19. Nonthaburi, 2021. (in Thai)

8. Phelps C, Sperry LL. Children and the COVID-19 pandemic. Psychol Trauma Theory Res Pract Policy 2020;12(S1):S73–S75. (doi: https://doi.org/10.1037/tra0000861)

9. Wongchan W, Piyaaramwong P. Health literacy and prevention of coronavirus diseased 2019 among school age children. J Nurs Sci Health 2021;44(4):121-133 (in Thai)

10. Onyema EM, Eucheria NC, Obafemi FA, et al. Impact of Coronavirus pandemic on education. J Edu Pract 2020;11(13):108-121.

11. Green LW, Kreuter MW. Health program planning: an education and ecological approach, 4thed. New York. Mc Graw-Hill, 2005.

12. Muksing W, Tohyusoh N, Punriddum J. Factors related to health care behavior among school children in Nakhon Si Thammarat municipality. South Coll Net J Nurs Public Health 2016;3(3):65-76 (in Thai)

13. Pakluck P, Teerarungsikul N, Sananreangsak S. Factors related to self-regulation for asthma control among school - age children. J Faculty of Nurs Burapha Univ 2017;25(4) 32-41 (in Thai)

14. Cohen J. Statistical power analysis for the behavioral sciences, 2nd ed. Hillsdale, New Jersey. Lawrence Erlbaum Associates,1988.

15. Park S, Oh S. Factors associated with preventive behaviors for COVID-19 among adolescents in South Korea. J Pediatr Nurs 2022;62:69-76.

16. Bloom, B.S. Handbook on formative and summative evaluation of student learning. New York. McGraw-Hill,1971.

17. Radwin LE, Cabral HJ. Trust in nurses scale: Construct validity and internal reliability evaluation. J Adv Nurs 2010;66(3):683–689.

18. Cha ES, Kim KH, Erlen JA. Translation of scales in cross-cultural research: Issues and techniques. J Adv Nurs 2007;58(4):386-395.

19. Nintachan P, Thanoi W, Sahgon S, Pattanamas M, Intharaksa C. Factors predicting resilience in underprivileged adolescents. J Psychiatri Nurs Mental Health 2017;31(1):13-28. (in Thai)

20. Schaefer C, Coyne JC, Lazarus RS. The health-related functions of social support. J Behavior Med 1981;4(4):381–406.

21. Lueboonthavatchai P. Prevalence and psychosocial factors of anxiety and depression in breast cancer patients. J Med Assoc Thai 2007; 90(10):2164–2174. (in Thai)

22. Grotberg E. Countering depression with the five building blocks resilience. Reach Today's Youth 1999;4(1):65-72.

23. Nilchaikovit T, Sukying C, Silpakit C. Reliability and validity of the Thai version of the general health questionnaire. J Psychiatr Assoc Thai 1996;41(1):2-17. (in Thai)

24. Srisuk W, Mekkamol K, Banthaowong O. Factors Influencing Covid-19 prevention behavior among upper primary school students in Mueang District, Chanthaburi Province. J Public Health Health Sci 2022;5(2):65-78. (in Thai)

25. Dittabunjong P, Rungnoei N, Suksamran A, Jarupisitphaibun C. Factors predicting COVID-19 preventive behaviors among intermediate school students. J Health Nurs Educ 2022; 28(2):77-93. (in Thai)

26. Almutairi A. Knowledge and preventive behavior regarding COVID-19 among school-children in Saudi Arabia: A regional survey. Egypt J Hosp Med 2022;88:2280-2287.

27. Dastgerdi Z, khoshgoftar M,Tavakoli B, Jaleh M. Factors associated with preventive behaviors of COVID-19 among adolescents: Applying the health belief model. J Res Soc Admin Pharmacy 2021;17:1786-1790.

28. Gao H, Hu R, Yin H, Yuan K. Knowledge, attitudes and practices of the Chinese public with respect to coronavirus disease (COVID-19): an online cross-sectional survey. J BMC Public Health 2020;20:1816. (doi: 10.1186/s12889-020-09961-2)

29. Chum-in C, Intharat S, Vinchuan S, Pandum T. The mechanism in services during the COVID-19 crisis: A case study of Ban Khlong Muan health promoting hospital of Nong Prue Subdistrict, Ratsada District, Trang Province. J Legal Entity Manag Local Innov 2021;7(5):295-309. (in Thai)

30. Pethin S. The medical service and public health and people' life quality of health, Prasartthong Municiple Sub District, Bang Pa in District, Ayutthaya Province. J Chandrakaserm Sarn 2015;21(41):135-144. (in Thai)

31. Skokauskas N, Leventhal B, Cardeli E, Belfer M, Jannike K, Cohen J. Supporting children of healthcare workers during the COVID 19 pandemic. J Eur Child Adolesc Psychiatry 2022;31(1):203-204.