# Factors Associated to the Intention to Prevent COVID-19
# ปัจจัยที่มีความสัมพันธ์กับความตั้งใจในการป้องกันโรคโควิด-19

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## Abstract

The coronavirus (COVID-19) infection leads to a surge in the disease and the infection results in a high mortality rate. To reduce the spread, it is important to engage in preventive behaviors recommended by the ministry of public health, such as washing hands, wearing a face mask, and social distancing. This study aimed to investigate factors associated with the intention to prevent COVID-19 based on protection motivation theory (PMT). It is a cross-sectional study. A sample of 422 individuals aged 18-year-old and above who reside in Mueang District, Sakon Nakhon, participated in the study. They were selected using multi-stage random sampling. The data collection instrument was a researcher-made questionnaire. The content of questionnaire was constructed base on the conceptual framework of the PMT. The data obtained were analyzed by using percentage, mean, standard deviation and Pearson's Correlation. Results showed that factors of knowledge, perceived threat, perceived severity, response efficacy, self-efficacy, had a positive correlation with the intention to prevent COVID- 19. However, stress showed a negative correlation with the pandemic situation. This correlation exhibits statistical significance ($p<.001$). With these factors, it can be used to design a training program to educate people, village health volunteer and family health leaders and community health leaders. This will also be applied to caregivers of people infected with coronavirus 2019 who are staying at home in the future.

**Keywords:** Coronavirus 2019, COVID-19, Protective Motivation Theory, Prevention, Intention

**บทคัดย่อ**

การติดเชื้อไวรัสโคโรนา 2019 (โควิด-19) ส่งผลให้มีอัตราอุบัติการณ์ของโรคสูงและการติดเชื้อนั้นส่งผลให้มีอัตราการเสียชีวิตสูงด้วย ดังนั้นเพื่อลดการแพร่กระจายของโรค สิ่งสำคัญ คือ การมีพฤติกรรมการป้องกันที่ถูกต้องซึ่งมีมาตรการจากกระทรวงสาธารณสุข ได้แก่ การล้างมือ การสวมหน้ากากอนามัย และการเว้นระยะห่างทางสังคม การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่มีความสัมพันธ์ต่อความตั้งใจในการป้องกันโรคโควิด-19 ของประชาชน ตามทฤษฎีแรงจูงใจในการป้องกันโรค เป็นการศึกษาแบบภาคตัดขวาง โดยกลุ่มตัวอย่างที่ใช้ คือ ประชาชนที่มีอายุ 18 ปีขึ้นไปที่อาศัยอยู่ในเขตอำเภอเมือง จังหวัดสกลนคร จำนวน 422 คน โดยใช้การสุ่มตัวอย่างแบบหลายขั้นตอน เครื่องมือที่ใช้เป็นแบบสอบถามที่ผู้วิจัยสร้างขึ้นมาโดยใช้กรอบแนวคิดของทฤษฎีแรงจูงใจในการป้องกันโรค การเก็บรวบรวมข้อมูลโดยใช้แบบสอบถาม วิเคราะห์ข้อมูลด้วยสถิติ ร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน และค่าสัมประสิทธิ์สหสัมพันธ์เพียร์สัน ผลการวิจัย พบว่า ความสัมพันธ์ของความรู้เกี่ยวกับโรคโควิด-19 การรับรู้โอกาสเสี่ยงต่อการเป็นโรค ความคาดหวังในการตอบสนองในการป้องกันโรค ความคาดหวังในความสามารถของตนเองมีความสัมพันธ์เชิงบวกต่อการป้องกันโรคโควิด-19 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001 ส่วนความเครียดมีความสัมพันธ์เชิงลบในระดับต่ำต่อสถานการณ์การระบาดของโรคโควิด-19 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001 ซึ่งปัจจัยเหล่านี้สามารถนำไปออกแบบโปรแกรมพฤติกรรมการป้องกันโรคโควิด-19 และจัดทำเป็นหลักสูตรฝึกอบรมให้ความรู้แก่ประชาชน อาสาสมัครสาธารณสุขประจำหมู่บ้าน แกนนำสุขภาพครอบครัว รวมถึงนำไปปรับใช้กับผู้ดูแลผู้ป่วยโควิด-19 ที่รักษาตัวอยู่ที่บ้านในโอกาสต่อไป

**คำสำคัญ:** โคโรนาไวรัส 2019 โควิด-19 ความตั้งใจ ทฤษฎีแรงจูงใจในการป้องกันโรค การป้องกันโรค

## Introduction

A novel coronavirus disease (COVID-19) was first reported in Wuhan, Hubei province, China, in December 2019 (Bashirian et al., 2020a). COVID-19 is a pandemic affecting many countries globally with significant morbidity and mortality. The virus is the most recent highly infectious human respiratory disease is caused by severe acute respiratory syndrome. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes (Al-Rasheed, 2020; WHO, 2021a).

COVID-19 is a highly spreadable disease, that can rapidly spread and infect many people. The outcomes of this disease are severe respiratory tract infection and mortality. WHO has taken preventive measures, including physical distancing at least a one-meter distance, wearing a mask, avoiding crowds, keeping rooms well ventilated, washing the hand regularly, not touching the mouth, nose, or eyes and coughing into a bent elbow or tissue (WHO, 2021c). As a consequence of COVID-19 pandemic, various prevention from Thai Ministry of public health were implemented massive lockdown, DMHTT (D=Distancing, M=Mask wearing, H=Hand washing, T=Testing temperature, T=Thai Chana application) and home isolation (Department of Disease Control. Ministry of Public Health, 2021; The Civil Aviation Authority of Thailand (CAAT), 2021). Moreover, the vaccination prevention policy is recognized around the world. However, the vaccine from many companies has been developed for this disease. Because of the vaccine has been decreased spread of infection, severe disease and mortality (WHO, 2021a). However, self-protection behavior is also essential to effective disease prevention.

Due to the epidemic situation in China, many countries have been affected, including Thailand. The monthly data report on October 2019. Thailand's situation in 2019 found 3,652 confirmed cases and 59 cumulative deaths reported. In the northeastern region, the disease outbreaks were relatively low. From the reporting of ministry of public health, it was found that the highest number of infections in the Northeast was 26 and the lowest was 1 case. Sakon

Nakhon province has the lowest number of COVID-19 cases. There is a relatively low incidence of local infectious while of surrounding area has a relatively high infection rate. Therefore, the measures from the Ministry of Public Health that are used in the area are the same throughout the country. (Department of Disease Control. Ministry of Public Health, 2021)

Generally, health behavior theories can be changing the behavior can predict protective behaviors is the Protective Motivation Theory (PMT) (Rogers & Prentice-Dunn, 1997). Based on Protective Motivation Theory (PMT), when individuals encounter a threatening event, they are primarily motivated to engage in protective behavior. According to previous research, individuals believe that performing preventive behavior can reduce the threat that comes with a lack of action. During a global crisis, providing reliable and accurate information is essential (Prasetyo, Castillo, Salonga, Sia, & Seneta, 2020). Among theories that have been used in various studies to predict protective behavior, is the PMT towards COVID-19 prevention (Al-Rasheed, 2020; Bashirian et al., 2020b; Kowalski & Black, 2021; Mortada, Abdel-Azeem, Al Showair, & Zalat, 2021; Taheri-Kharameh et al., 2020)

Considering, the importance of identifying the determinants of the preventive behaviors of COVID-19, this study was conducted for predicting intention to prevent COVID-19 among people, based on the PMT.

## Objective

To study the factors associated to the intention to prevent COVID-19 based on protection motivation theory.

## Literature Review

COVID-19 is an infectious disease. The disease it causes is called coronavirus disease 2019. The World Health Organization (WHO) declared the COVID-19 outbreak a pandemic (WHO, 2021a). Signs and symptoms of COVID-19 may appear 2 to 14 days after exposure. This time after exposure and before having symptoms is called the incubation period. Common signs and symptoms can include: fever, cough and tiredness. Early symptoms of COVID-19 may include a loss of taste or smell and other symptoms can include: shortness of breath or difficulty breathing, muscle aches, chills, sore throat, headache, nausea, vomiting, diarrhea, rash, chest pain. The severity of COVID-19 symptoms can range from very mild to severe (WHO, 2021b). If the symptoms are very severe, it can lead to death. This is a disease that can be prevented by having the right preventive behaviors and preventive vaccination. But the vaccine doesn't confirm that if won't get infected, it only reduces the severity of the disease. Therefore, the easiest and fastest way to prevent disease by yourself is to have the right preventive behaviors.

Preventive behaviors are very important, which refers to the practice of a person to prevent the disease from occurring, such as not smoking, wearing a helmet including wearing a mask and hand washing with soap or 70% alcohol etc. (Department of Disease Control. Ministry of Public Health, 2021). Behavior refers to all reactions or activities of living things. In which a person expresses both internally and externally, both observable and unnoticeable, whether voluntarily doing or refraining from acting in this way, the behavior of a person varies according to socio-cultural conditions. This is often influenced by the expectations of the people around the situation and past experiences. (Bashirian et al., 2020a) (Department of Disease Control. Ministry of Public Health, 2021)

Protective Motivation Theory (PMT) was developed by Rogers in 1975, to describes how individuals are motivated to react in a self-protective way towards a perceived health threat.

There was defined how individuals are motivated to react in a self-protective way towards a perceived health threat. PMT is a widely-used framework to understand responses to triggers that appraise individuals of a potential threat. The PMT function of four factors including perceived threat,

perceived severity, response efficacy, intention to be prevention and outcome efficaciousness of behaviors that would reduce the health threat, and self-efficacy (Rogers, 1975; 1983).

Using PMT, as a robust and flexile social theory, intention prevention of COVID-19 may be assisted to be better understand their own response intention behavior ahead of COVID-19.

## Methodology

### Study Design and Population

The present cross-sectional and analytical study was conducted in Sakon Nakhon province in October 2020. The aimed of the study was to define the associated factors among people, age 18 years or more. The target population was people who has lived at Sakon Nakhon for 6 months or more. The sample size was calculated by proportional formula (Wayne, & Chad, 2013). The sample size was equal to 422 participants. The participants were selected using the multi-stage and simple random sampling. The random sample of 1 district out of 18 districts was randomly assigned was Mueang district. After that, from 16 sub-districts were simple random sampling was 5 sub-districts including That Cheng Chum, Chiang Kruea, Tha Rae, That Na Weng and Hang Hong sub-districts. Inclusion criteria were participants with complete consciousness, who were able to listen to, read, and write Thai language. Exclusion criteria were involuntary those who cannot speak read or write in Thai language, and those who decided to withdraw from the study at any time.

### Instruments Measures

The data collection instrument was a researcher-made questionnaire. The content of questionnaire was constructed base on the conceptual framework of the PMT. The validity of this questionnaire was assessed by the content validity method. The content of the questionnaire was extracted from credible sources, including books and research articles. There was approved by a panel of three experts. Index of item objective congruence (IOC) was 0.70. Its reliability was approved, based on the Cronbach's alpha method. The study samples were 30 people with similar characteristics to the study sample. Cronbach's alpha coefficient was used to test the reliability of PMT questionnaires; including COVID-19 severity perception questionnaire, the perceived threat of COVID-19, perceived severity, response efficacy, self-efficacy and intention to prevent COVID-19. The reliability of questionnaire was calculated by Cronbach' alpha coefficient equal to 0.83. The reliability in each section was presented (table 2)

The questionnaire consists of 5 parts including:

1. Demographic data including sex, age, education, salary, marital status, and occupation.

2. Knowledge assessment form about COVID-19.

3. COVID-19 severity perception questionnaire including perceived threat of COVID-19, perceived severity, response efficacy, self-efficacy to response the prevention of COVID-19.

4. Intention to prevent COVID-19.

5. Stress assessment form of the department of mental health. (Department of Mental Health, 2020)

In the first part of answer were dichotomous on 0-1 point. The next section of two to four parts of answer were on 5-point Likert scales. And, the latest part of answer was on 0-3 point. The details of score was reported (table 2)

### Statistical Analysis

Numerical and categorical data were expressed as mean ± standard deviation and frequency or percentage, respectively. Descriptive analysis of quantitative variables was made with measurement of central tendency and dispersion. The correlation between PMT and socio-demographic were analyzed by using Pearson correlation product's moment. The p-value<.05 was considered statistically significant. Data analysis and processing were performed using SPSS 26.0 Statistical program for Windows.

**Ethical Approval**

This study was approved by the Institutional Review board of Human Research Protection Unit, Sakon Nakhon Provincial Public Health Office (SKN REC 2021-001). Written informed consents were obtained from participants who decided to join the study. Participants' names were deleted from the data-based files to protect the participant's privacy and confidentiality. Refusing to participate in the study would not have any effects on participants and services receiving from the public health centers.

## Results and Discussion

A total of 422 participants were in the age range of 18-83 with an average age of 40±15.54 years. 257 individuals were female (60.9%), 38.4% had been educated in primary school, 28.2% had been a farmer and, 64.7 % marital status. Of most people, 90 % have known COVID-19 and 84.6% received knowledge of COVID-19 (Table 1).

Table 2 presents the range of scores for the knowledge, stress and PMT constructs. The crude mean scores were measured in respect to the target intention to preventive behavior COVID-19. Most of the factors to prevention COVID-19 based on the PMT were at a high level. But the stress was low level (69.7%) (Table 2).

Mean and standard deviation scores of the knowledge, perceived threat, perceived severity, response efficacy, self-efficacy, intention and stress (Table 3).

The correlation between variables and intention to preventive of COVID-19, the results showed that the positive and significant correlation between intention and other constructs of the PMT model, including: perceived threat, perceived severity, response efficacy, and self-efficacy ($p<.001$). Moreover, the knowledge was positive correlation to intention ($p<.001$) but the stress was negative correlation to intention ($p<.001$) (Table 4).

In the present study, results indicated positive correlation of PMT construct ($p<.05$), were consistent with previous research. The study of applied by PMT, which found the predictors for the intention based on the constructs of PMT included perceived threat and coping appraisal ($p<.001$) and R2 of 10% ($p<.001$) (Bashirian et al., 2020). In the study by Shahnazi, Ahmadi-Livani (Shahnazi et al., 2020) on the pandemic COVID-19 during 2 months among healthcare providers in Saudi Arabia, did not have a significant effect on the intention of preventive behavior. Nevertheless, there was a significant positive correlation between behavioral intention and other constructs of PMT model ($p<.05$). Moreover, a Japanese study on PMT, the PMT construct were positive correlations with staying at home and gender, with weak to moderate associations ($p<.001$) (Okuhara, Okada, & Kiuchi, 2020).

Moreover, the results of among Turkish adults, which the perceived risk of coronavirus has correlation to preventive behavior. Females reported greater vulnerability, perceived risk, fear and preventive behaviors than males ($p<.001$). (Yıldırım, Geçer, & Akgül, 2021)

The protective intention against the COVID-19 evaluated at a relatively favorable level. There were studied factors associated with preventive behaviors (Bashirian et al., 2020; Kowalski, & Black, 2021; Mortada et al., 2021; Okuhara et al., 2020; Shahnazi et al., 2020). The predictors of COVID-19 preventive behaviors in Northern Iran, were self-efficacy, and perceived benefits (Shahnazi et al., 2020). Also, in the study of Kowalski and Black (Kowalski, & Black, 2021), the participants were recruited for the Facebook Page published by the authors survey. This study founded the predictive factors were knowledge, perceived severity, outcome efficaciousness, and self-efficacy ($p<.05$), respectively and $R^2$ of 12-16% ($p<.001$). Comply with the study among hospital staff in Iran, the preventive behaviors were assessed at a relatively desirable level and the predictors of PMT on protection motivation to conduct

COVID-19 preventive behaviors (p<.001) (Bashirian et al., 2020). The regression analysis to predict staying at home including gender, age, education, severity, and self-efficacy (p<.05). The following variables are also protective against the COVID-19 (Okuhara et al., 2020).

However, there has not been any study of stress on the intention to have preventive behaviors based on PMT. Although in this infection situation it will result in a strain on the infection. But it was found that the level of stress that had a positive effect on people's determination to have preventive behaviors.

One of the limitations of this study is that of not evaluating behavior. Furthermore, the reluctance of some members of the research community to participate in the study was another limitation. However, the findings showed that intention to prevention COVID-19 were at relatively favorable levels among people at Sakon Nakhon. Therefore, future training programs, must consider the level of self-efficacy, perceived severity and perceived threat of people and increasing of their knowledge regarding the effectiveness of recommendation strategies to perform protective measures against the COVID-19, and monitoring of long-term preventive behaviors as well.

## Conclusions

The findings of the study have to investigate factors associated with the intention to prevent COVID-19 based on protection motivation theory (PMT). A cross-sectional analytical study was employed to collect data in Sakon Nakhon province. The sample size was 422 participants. Which were selected using the multi-stage stage and simple random sampling. By randomly picking Mueang districts and simple random sampling getting 5 sub-districts. The data collection instrument was research-made questionnaire. There was approved by a panel of three experts. The IOC was 0.70. Cronbach's alpha coefficient was used to test the reliability of PMT questionnaires including perceived threat, perceived severity, response-efficacy, self-efficacy and intention to prevent COVID-19. The total Cronbach's alpha equal to 0.83. And each part of the questionnaire had a Cronbach's alpha equal to knowledge, perceived threat, perceived severity, response efficacy, self-efficacy, and intention were 0.633, 0.640, 0.686, 0.838, 0.748 and 0.739 respectively. The results of the study indicated that rate of adherence to intention to preventive from COVID-19 was at a desirable level. The correlation analysis in the present study found that, of the positive correlation between variables to intention including knowledge, perceived severity, response efficacy, self-efficacy, were significantly (p<.001). Stress has a negative correlation, which is a good thing because mild to moderate stress has a positive effect on disease prevention intentions.

The research results indicated that the perceived severity, self-efficacy, and perceived threat had a mild to moderate predictive power of intention to prevention from COVID-19. Therefore, it is necessary to perform interventions to increase awareness to promote health behaviors, inducing the benefits of preventative behaviors increasing the perceived self-efficacy, and thus overcoming the barriers to preventive behaviors from COVID-19. It is suggested to decreasing the fatalistic beliefs.

## Recommendation

Concurrently, COVID-19 is a major health problem and an important and challenging issue in public health. The issue of COVID-19 should be studied in other issues and other target groups. It is divided into policy and academic recommendations. Policy recommendations are training, is organized to educate personnel in the field of public health, village health volunteer, family health leader and community leader. Especially apply in the home isolation for infected patient. As for the academic recommendations, we include curricula for teaching in schools and universities. In addition, the manual

will guide people's behavior. In future research, the control factors predicting of preventive diseases should be studied.

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**Table 1** Socio-demographic characteristics of participants (n=422).

| Variables | n | % |
|---|---|---|
| **Sex** | | |
| Male | 165 | 39.1 |
| Female | 257 | 60.9 |
| **Education** | | |
| Uneducated | 18 | 4.3 |
| Primary school | 162 | 38.4 |
| High school | 69 | 16.4 |
| Diploma | 50 | 11.8 |
| Bachelor degree | 123 | 29.1 |
| **Salary per months** (THB) | | |
| ≤ 3,000 | 125 | 29.6 |
| 3,001 - 6,000 | 151 | 35.8 |
| 6,001 – 9,000 | 98 | 23.2 |
| 9,001 – 12,000 | 19 | 4.5 |
| 12,001 – 15,000 | 13 | 3.1 |
| > 15,000 | 16 | 3.8 |
| **Marital status** | | |
| Single | 142 | 33.6 |
| Married | 273 | 64.7 |
| Divorced | 7 | 1.7 |
| **Occupational** | | |
| unemployed | 33 | 7.8 |
| Student | 101 | 23.9 |
| Trade | 43 | 10.2 |
| Serve the public | 12 | 2.8 |
| Farmers | 119 | 28.2 |
| General contractor | 85 | 20.1 |
| Business profile | 6.9 | 6.9 |
| **Previously known COVID-19** | | |
| Yes | 357 | 84.6 |
| No | 65 | 15.4 |
| **Previously received knowledge about COVID-19** | | |
| Yes | 359 | 85.1 |
| No | 63 | 14.9 |

**Table 2.** Variables of the knowledge, stress and PMT of COVID-19 (n=422)

| Variables | Item number | Cronbach's alpha (n=30) | Range of score | Crude mean (SD) |
|---|---|---|---|---|
| Knowledge | 10 | 0.633 | 0-30 | 27.13 (3.29) |
| Perceived threat | 9 | 0.640 | 1-45 | 39.79 (3.45) |
| Perceived severity | 10 | 0.686 | 1-50 | 43.48 (4.34) |
| Response efficacy | 8 | 0.838 | 1-40 | 33.86 (3.46) |
| Self-efficacy | 9 | 0.748 | 1-45 | 38.00 (3.91) |
| Intention | 10 | 0.739 | 0-50 | 45.21 (3.80) |
| Stress | 8 | 0.890 | 0-24 | 4.70 (4.12) |

**Table 3.** Level of factors to prevention COVID-19 is classified into number and percentage. (n=422)

| Variables | Level | | |
|---|---|---|---|
| | Low | Medium | High |
| Knowledge | 1 (0.2) | 10 (2.4) | 411 (97.4) |
| Perceived threat | 0 (0.0) | 5 (1.1) | 417 (98.9) |
| Perceived severity | 0 (0.0) | 4 (0.9) | 418 (99.1) |
| Response efficacy | 0 (0.0) | 25 (5.9) | 397 (94.1) |
| Self-efficacy | 0 (0.0) | 17 (4.0) | 405 (96.0) |
| Intention | 0 (0.0) | 7 (1.6) | 415 (98.4) |
| Stress | 294 (69.7) | 101 (24.0) | 27 (6.2) |

**Table 4.** Pearson Correlation coefficients between variables and COVID-19 (n=422).

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Knowledge | 1 | | | | | | |
| 2. Perceived threat | 0.14** | 1 | | | | | |
| 3. Perceived severity | 0.21** | 0.57** | 1 | | | | |
| 4. Response efficacy | 0.10 | 0.51** | 0.69** | 1 | | | |
| 5. Self-efficacy | 0.08 | 0.46** | 0.63** | 0.72** | 1 | | |
| 6. Intention | 0.15** | 0.48** | 0.61** | 0.56** | 0.56** | 1 | |
| 7. Stress | -0.06 | -0.25** | -0.16** | -0.25** | -0.17** | -0.20** | 1 |

* p-value<.05, ** p-value<.001