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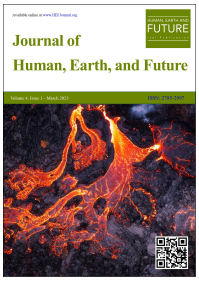

Factors Influencing the Risk Aversion in Vietnam: The Mediating Role of the Intention to Prevent COVID-19

Vu Van Dong [1], Tran Nha Ghi [2*], Nguyen Tan Trung [3], Tran Dang Khoa [3]

[1] *Faculty of Finance and Accounting, Ho Chi Minh City University of Industry and Trade, Vietnam.*

[2] *Faculty of Business Administration, Industrial University of Ho Chi Minh City, Vietnam.*

[3] *School of Management, University of Economics Ho Chi Minh City, Vietnam.*

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Abstract

The pandemic in Vietnam is increasingly escalating and spreading across provinces and cities. Therefore, Vietnam needs to implement preventive measures to control the spread of COVID-19. This study aims to examine the influencing factors, such as COVID-19 knowledge, behavior control, moral and subjective norms, the government's preventive e-guidelines, domestic social media, and environmental factors, on the intention to prevent COVID-19 and risk aversion. The study surveyed 201 Vietnamese citizens and utilized the Partial Least Squares Structural Equation Modeling (PLS-SEM) method to estimate path coefficients. The results indicate that COVID-19 knowledge, morals, and subjective norms positively impact the intention to prevent COVID-19 and risk aversion. The theoretical contribution of this study reveals that the intention to prevent the spread of COVID-19 partially mediates COVID-19 knowledge, moral and subjective norms, and risk aversion. Regarding practical implications, knowledge of COVID-19 transmission, symptoms, and preventive measures guided by healthcare experts and social networks (family, friends, and colleagues) is highly beneficial in Vietnam's efforts to combat the COVID-19 outbreak. Lastly, the study proposes some limitations and suggestions for further research.

Keywords: Covid-19 Knowledge; Behavioral Control; Moral and Subject Norms; Preventive E-guidelines; Intention to Prevent COVID-19; Environmental Factors; Social Media; Risk Aversion.

1. Introduction

COVID-19 has emerged as a formidable threat to public health and the global economy, significantly impacting human lives. It has instilled feelings of anxiety, fear, and even depression [1]. Communities worldwide have been instructed to stay at home, practice regular handwashing, avoid gatherings, maintain a distance of 1-2 meters from others (social distancing), and refrain from touching their faces to prevent the spread of COVID-19. These guidelines have been crucial in mitigating the transmission of the virus [2]. COVID-19 has caused a substantial number of fatalities worldwide, posing a severe threat to global community health [3]. In conjunction with the pandemic's immeasurable socio-economic impacts, the escalating mortality and morbidity rates have become an intricate challenge. The World Health Organization (WHO) reports a 3–4% mortality rate. Globally, as of March 7th, 2022, COVID-19 has infected 447,882,175 individuals worldwide, resulting in 6,007,317 fatalities. These figures underscore the urgent need for concerted efforts to combat the spread of the virus and mitigate its devastating consequences.

* Corresponding author: trannhaghi@iuh.edu.vn

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As of the present date, March 7th, 2022, Vietnam has recorded 4,582,058 confirmed COVID-19 cases, with 40,089 fatalities. The number of new infections in the past 14 days has significantly increased, reaching 1,747,865 cases. These statistics highlight the pressing need for continued vigilance and the implementation of effective measures to contain the spread of the virus and protect public health [4]. To curb the transmission and reduce the number of COVID-19-related deaths, the government of Vietnam has intensified its vaccination efforts. Currently, 81% of the population has received both doses of the vaccine, 83% have received at least one dose, and 42% have received the booster shot (third dose). Compared to the global average of 56.8% of the population fully vaccinated, these figures highlight the commendable efforts of the Vietnamese government in combating the spread of COVID-19 and minimizing fatalities. Figure 1 illustrates the total number of vaccine doses administered to the population as of January 30th, 2023, amounting to 270.57 million.

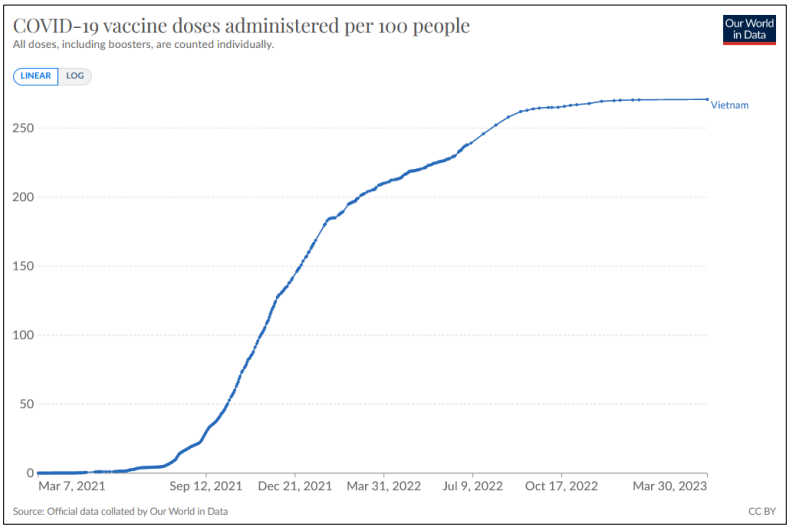

Figure 1. Covid-19 vaccine doses administered per 100 people

The number of COVID-19 cases continues to rise, with an average of 147,358 new infections reported daily. The average number of infections per million people stands at 47,626. While the global trend shows a decrease in new cases, Vietnam experiences an upward trajectory in new infections. Figure 2 illustrates the increasing trend of COVID-19 cases and new fatalities from December 2021 to March 2022. This highlights the pressing need for continued vigilance and stringent measures to curb the spread of the virus in Vietnam.

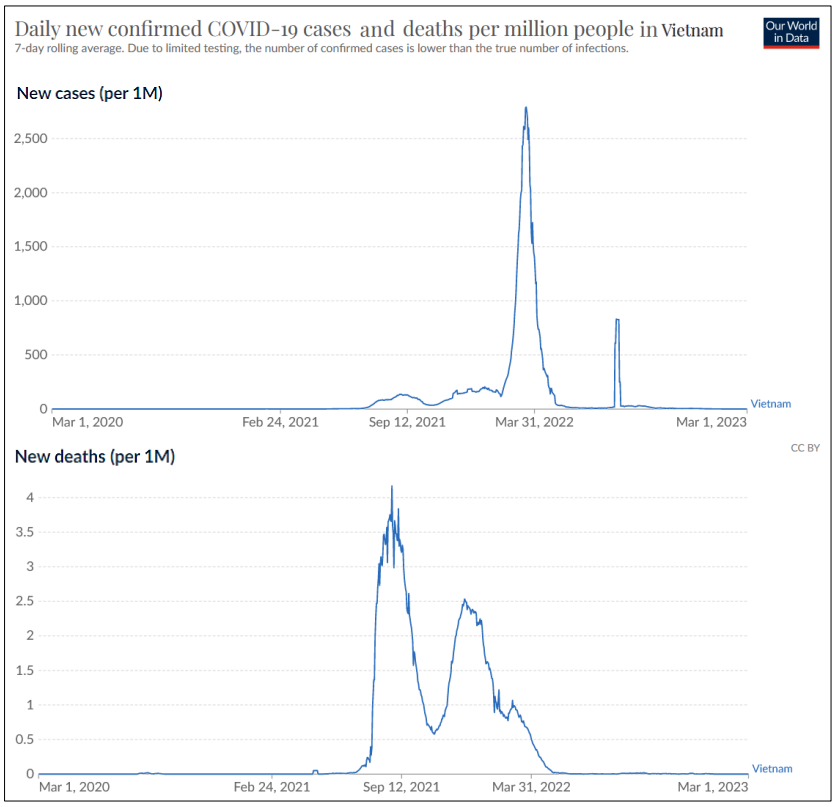

Figure 2. Vietnam's new cases and deaths

In Vietnam, the spread of the COVID-19 pandemic shows a solid upward trend. In addition to implementing the 5K measures recommended by the Ministry of Health (mask wearing, disinfection, distance keeping, no gathering, health declaration), it is crucial to enhance knowledge about COVID-19 and raise public awareness about the prevention and control efforts. In the current pandemic, the effectiveness of individual protective measures relies heavily on the community's clear understanding of COVID-19 knowledge and active adherence to the government's prevention guidelines. To effectively combat COVID-19, individuals need to have the intention to apply preventive measures. Based on practical concerns, the research question arises:

Question 1: What are the main causes of the spread of the COVID-19 pandemic?

Question 2: How can we control the spread of the pandemic and increase the intention of Vietnamese people to prevent and combat COVID-19?

Indeed, the global scientific community has shown great interest in studying the spread of the COVID-19 pandemic. For instance, Aabed & Lashin [5] have demonstrated that the growth rate of COVID-19 tends to peak in temperate regions during the outbreak, while it is relatively lower in tropical regions. Additionally, environmental factors such as air pollution, sea level, and population density positively correlate with the transmission rate of COVID-19. The research conducted by Stott [6] has highlighted the link between climate change and the emergence and spread of various infectious diseases. Furthermore, cold and dry weather conditions have been identified as favorable for the transmission of respiratory viruses, such as the flu, through droplet intermediaries. The SARS outbreak, for example, subsided as the weather warmed up and eventually ended in July 2003. The COVID-19 pandemic has indeed been observed predominantly in countries located in colder regions [7]. Chesser et al. [8] described the knowledge, beliefs, and role of social media in health crises in the United States. Approximately 43% of students confirmed a high level of health literacy. Most students learn about the COVID-19 pandemic through the Internet and social media. Most students have a basic understanding of COVID-19, while only 18% know all the symptoms associated with the disease. Hayat et al. [9] highlight the importance of community awareness regarding the symptoms of COVID-19. The authors examined public awareness of knowledge, practices, and attitudes toward COVID-19 in Pakistan. Over 60% of respondents demonstrated a good understanding of COVID-19. Knowledge of COVID-19 was significantly associated with educational level, gender, and marital status. Approximately 77% of those surveyed believed COVID-19 would be successfully controlled in Pakistan. Moreover, over 85% of respondents reported using face masks for personal protection, while more than 88% emphasized the importance of frequent handwashing. Azlan et al. [10] address the lockdown and movement control policy to curb the spread of COVID-19. The authors examine the role of knowledge, practices, and attitudes toward COVID-19 in ensuring that Malaysian society is prepared to accept measures to mitigate the outbreak. Over 80% of respondents know about COVID-19. Many participants have adhered to preventive measures such as avoiding crowds (83.4%) and practicing hand hygiene (87.8%). Surprisingly, only 51.2% of participants reported using face masks in Malaysia.

Gebretsadik et al. [11] assessed COVID-19 knowledge, practical skills, and awareness in Ethiopia using logistic regression. Over 80% of respondents knew about the disease's clinical symptoms. Approximately 72% believed that older adults with chronic illnesses were more likely to contract COVID-19. More than 90% acknowledged respiratory droplets as a significant factor in the transmission of COVID-19. Measures such as avoiding handshakes (53.8%) and practicing frequent handwashing (77.3%) were commonly reported to prevent the spread of the virus. Zhang et al. [12] examine healthcare workers' knowledge, attitudes, and practices during the COVID-19 pandemic in China. Around 89% of healthcare workers demonstrated sufficient knowledge about COVID-19, while 85% expressed concerns about contracting the virus themselves. Approximately 90% of healthcare workers reported implementing recommended measures during the pandemic. Risk factors such as job type and work experience also influence the practice and attitudes of healthcare workers.

According to Dryhurst et al. [13], the spread of COVID-19 is influenced by people's willingness to adopt preventive measures. The authors assessed the perceived risk of COVID-19 in 10 countries across Asia, Europe, and the Americas. The United Kingdom exhibited a higher level of concern compared to other countries. Significant predictors of risk perception included personal experience with COVID-19, receiving information from friends, trust in government, individual and collective efficacy, trust in healthcare experts and scientists, and knowledge of government mitigation strategies. A significant correlation was reported between risk perception and the implementation of preventive measures in all ten countries. Zhong et al. [14] reveal that the behavior of Chinese residents during the COVID-19 pandemic is influenced by their knowledge, practices, and attitudes toward the disease. Approximately 90% of respondents demonstrated accurate knowledge about COVID-19, while 97.1% expressed confidence in China's ability to overcome the pandemic. Most respondents (98.0%) reported using face masks when going outside. Raza et al. [15] explore COVID-19 knowledge, control behavior, ethical and subjective norms, government preventive guidelines, and environmental factors influencing the intention to prevent COVID-19 and risk aversion. The research findings reveal that ethical and subjective norms have a higher path coefficient. Other influential factors include government electronic guidelines for prevention, followed by COVID-19 knowledge and control behavior. The intention to prevent COVID-19 significantly and positively impacts risk aversion.

Based on the literature review, it is evident that factors such as COVID-19 knowledge, behavioral control, moral and subjective norms, government preventive e-guidelines, and environmental factors impact the intention to prevent COVID-19. However, the direct influence of these factors on risk aversion has yet to be extensively examined. Furthermore, this study supplements the research by considering the impact of "domestic social media platforms" on the intention to prevent COVID-19 and risk aversion in Vietnam. Additionally, the study examines the mediating role of the intention to prevent the disease, which is a significant contribution. Therefore, this research aims to fill the research gap by examining the influence of factors such as Covid-19 knowledge, behavioral control, moral and subjective norms, government preventive e-guidelines, and environmental factors on the intention to prevent Covid-19 and risk aversion in the context of the Covid-19 outbreak in Vietnam.

Implementing preventive measures is crucial to controlling the spread of the disease. There needs to be more knowledge of COVID-19 and preparedness for a pandemic within the population, which affects the transmission of information and access to media channels for individuals. Knowledge and behavior during a pandemic play a vital role in shaping communication policies and strategies [16]. Providing the public with guidance on practicing safe health behaviors has been proven effective in controlling disease spread. However, encouraging individuals to adopt preventive behaviors can be challenging. Rubin et al. [17] demonstrated that individuals are more likely to adhere to health-related recommendations if they perceive them to be effective.

Following the introduction, the study presents the theoretical framework, research methodology, and research findings, and concludes with managerial implications.

2. Theoretical Foundation and Research Model

2.1. Theory of Planning Behaviour

The theory of planned behavior (TPB) is a theoretical framework that illustrates the relationship between beliefs and an individual's behavior. It categorizes beliefs into three types: behavioral, normative, and control. TPB was developed from the Theory of Reasoned Action [18] to address the limitations of the previous theory, which assumed that human behavior is solely driven by rational control. TPB also incorporates the concept of self-perception or self-efficacy, abbreviated as SET. Bandura proposed SET in 1977, which originated from social cognition theory (see Figure 3).

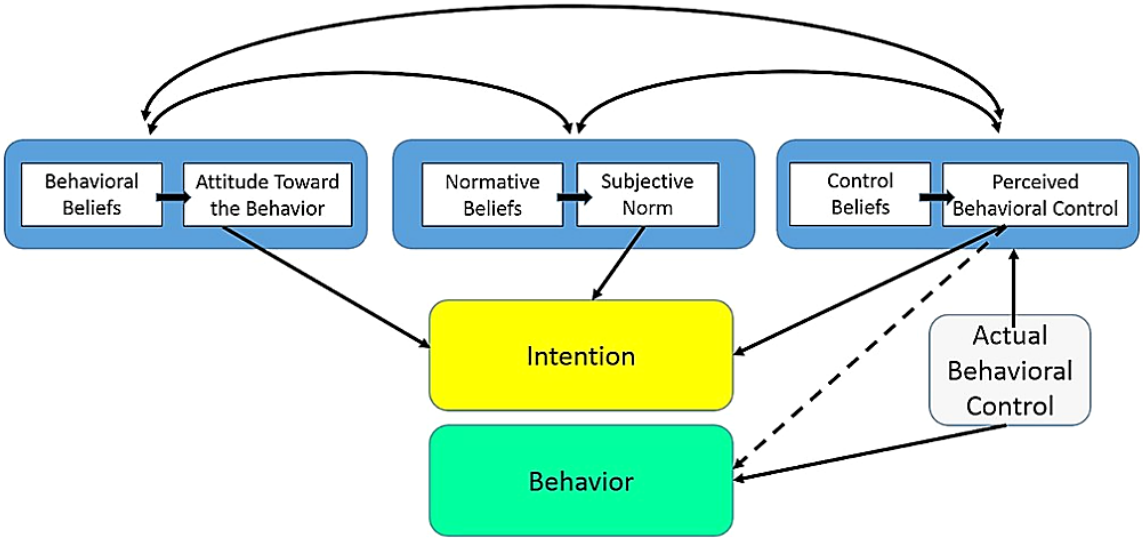

Figure 3. Theory of Planned Behavior

Corresponding to the three types of beliefs, behavioral beliefs generate an attitude towards the behavior (positive or negative), normative beliefs lead to subjective norms, and control beliefs give rise to perceived behavioral control. The TPB model assumes that behavior can be predicted or explained by the intentions to perform that behavior. Ajzen (1988) asserts that intentions are a function of three influencing factors: Attitudes toward the behavior; subjective norms; perceived behavioral control.

2.2. Research Hypotheses

The apprehension of the risks posed by COVID-19 includes feelings of anxiety, fear, and depression [1]. When a pandemic outbreak occurs, people often fear the risk of infection, the impact on their health, and even their lives. They proactively take preventive measures or avoid crowded places to protect their health and the health of their loved ones and families. The COVID-19 pandemic is straining public healthcare systems and the global economy. Therefore, each

country needs to implement preventive measures to control the spread. To control COVID-19, individuals must intend to prevent and fight against it. The intention to prevent COVID-19 refers to the public's adoption of preventive measures to control the spread of the disease [19].

In the current context of the pandemic, implementing protective measures for the well-being of individuals is only viable if the community possesses a clear understanding of COVID-19. According to Raza et al. [15], the public must have specific knowledge about COVID-19, such as its nature, modes of transmission, symptoms, and preventive measures. To be more precise, COVID-19 is an illness caused by the SARS-CoV-2 virus, first identified in December 2019 in Wuhan, China. This disease spreads quickly and has rapidly disseminated worldwide. COVID-19 can be transmitted through direct contact with an infected individual and shared touchpoints, including elevators, ATMs, entrances/exits, and through direct physical contact, such as shaking hands or handling goods. Furthermore, COVID-19 can enter the body through the nose, mouth, and eyes. In addition, the symptoms of COVID-19 include fever, dry cough, sneezing, body aches, and difficulty breathing. It is important to note that COVID-19 can affect the lungs, respiratory system, and other body parts. It is crucial to practice regular disinfection and wear face masks while also limiting close contact to prevent the spread of the disease.

Given the global spread of COVID-19, it is crucial to implement various disease prevention measures. To effectively control COVID-19, individuals need to intend to prevent it. However, this intention can be influenced by various factors, such as COVID-19 knowledge, behavioral control, moral and subjective norms, government preventive e-guidelines, environmental factors, and the impact of pandemic information from domestic social media. This study aims to assess the impact of these factors on the intention to prevent COVID-19 and risk aversion. The intention to prevent the spread of the disease can be influenced by behavioral control, moral and subjective norms, and attitudes toward the behavior. Knowledge and beliefs play a significant role in determining the effectiveness of individual actions, their alignment with goals, and the anticipation of outcomes [20]. Higher levels of knowledge may be associated with increased risk awareness [21]. Neupane et al. [22] examined preventive measures, knowledge, and attitudes among poultry market workers in China. The authors affirmed that a lack of knowledge is associated with a need for more preventive measures.

H11: COVID-19 knowledge positively influences the intention to prevent COVID-19.

H12: COVID-19 knowledge positively influences risk aversion.

Indeed, behavioral control refers to an individual's positive or negative attitude towards behavior and the expectations of significant others, as well as their perception of the ease or difficulty of performing a specific behavior in the context of a pandemic. Behavioral control reflects one's awareness of the ease or difficulty of engaging in a particular behavior and whether that behavior is considered positively or negatively valued. Blue [23] confirmed the influence of behavioral control on the intention to consume healthy food and engage in physical activities among patients with diabetes. Furthermore, Kang et al. [24] also demonstrated the significant impact of perceived behavioral control on the intention to provide care for patients among nurses in South Korea. Awareness of behavioral control is essential in preventing SARS in Singapore, Toronto, and Hong Kong [25].

H21: Behavioral control positively influences intention to prevent COVID-19.

H22: Behavioral control positively influences risk aversion.

Ethical standards entail providing support in the provision of face masks and disinfectants to others when they are infected or if an individual exhibits any symptoms. It is also the individual's responsibility to inform relevant healthcare agencies and apply preventive measures for themselves and others. On the other hand, subjective standards encompass advice and preventive measures proposed by healthcare experts, which strongly influence individuals' intentions to combat COVID-19 and their level of risk perception. Furthermore, guidance and instructions from colleagues, friends, and neighbors in implementing preventive measures are crucial. People follow instructions and guidance from individuals with higher expertise and knowledge. Intentional behavior is also influenced by subjective standards, which include an individual's perception of the significance of those around them and whether a behavior should or should not be performed. These subjective standards are determined by a belief in ethical norms and the motivation to adhere to specific regulations [26]. The ethical standard is an influential factor behind preventive attitudes. Investigating the relationship between ethical standards and tobacco use, Sorensen et al. (2005) revealed a higher prevalence of tobacco use in Bihar, India, due to strong ethical and social norms that encourage its use.

H31: Moral standards and subjective norms positively impact the intention to prevent COVID-19.

H32: Moral standards and subjective norms have a positive impact on risk aversion.

The government's electronic prevention guidelines are the policies implemented to mitigate the rapid spread of COVID-19. These include the development of health declaration applications, providing guidance to the public on preventive measures and home quarantine, and implementing phased isolation policies. All these policies are communicated through electronic notifications regarding COVID-19 prevention. During social distancing, individuals

receive information about the COVID situation through television, the press, and social media. Over 70% of the population uses Facebook, making it a widely accessible platform for disseminating information. The role of media is crucial in controlling and preventing disease transmission, as it can reduce the likelihood of contact between susceptible populations [27]. Social media platforms can promote self-care practices and emphasize treatment and disease prevention measures [28].

H41: The government's prevention e-guidelines positively impact the intention to prevent COVID-19.

H42: The government's prevention e-guidelines positively impact risk aversion.

H51: Domestic social media platforms positively impact the intention to prevent COVID-19.

H52: Domestic social media platforms positively impact risk aversion.

COVID-19 transmission depends on environmental factors such as temperature, humidity, rainfall, etc. The likelihood of disease transmission is very low when the weather becomes hotter and the humidity is between 60% to 85%. High temperatures can reduce the number of viruses; high temperatures can destroy the virus. According to numerous studies, nCoV can die at high temperatures. However, no conclusion has been reached regarding the virus's inability to spread during hot weather. The virus can survive and spread rapidly in poorly ventilated environments, especially in enclosed spaces with air conditioning. Once it enters the human body, it continues to develop, and at this point, the environmental temperature no longer has an impact. Research shows that when a new pandemic erupts, the SARS-CoV-2 virus can only survive outside the body for 3-5 days, with some cases lasting up to 14 days. Stott [6] discovered a correlation between climate change and the spread of infectious diseases. Cold and dry weather conditions favor the transmission of viral diseases through tiny droplets, such as the flu. The SARS outbreak decreased as the weather warmed and ended in July 2003 [7]. The use of masks is crucial in protecting healthcare workers in hospitals and can help reduce the spread of a pandemic like COVID-19. Scarano et al. [29] argue that as temperatures rise, compliance with wearing N95 masks decreases, and discomfort increases compared to surgical masks.

H61: Environmental factors have an inverse impact on the intention to prevent COVID-19.

H62: Environmental factors have an inverse impact on risk aversion.

Risk-averse individuals will have to confront the "prevention elasticity with risk" need, meaning that as the percentage of risk increases, the percentage of self-protective behaviors will also increase [21]. Generally, it is believed that people tend to make rational decisions to avoid risks [30].

H7: Intention to prevent COVID-19 has a positive impact on risk aversion.

The proposed research model that was used to achieve the study's aims is shown in Figure 4.

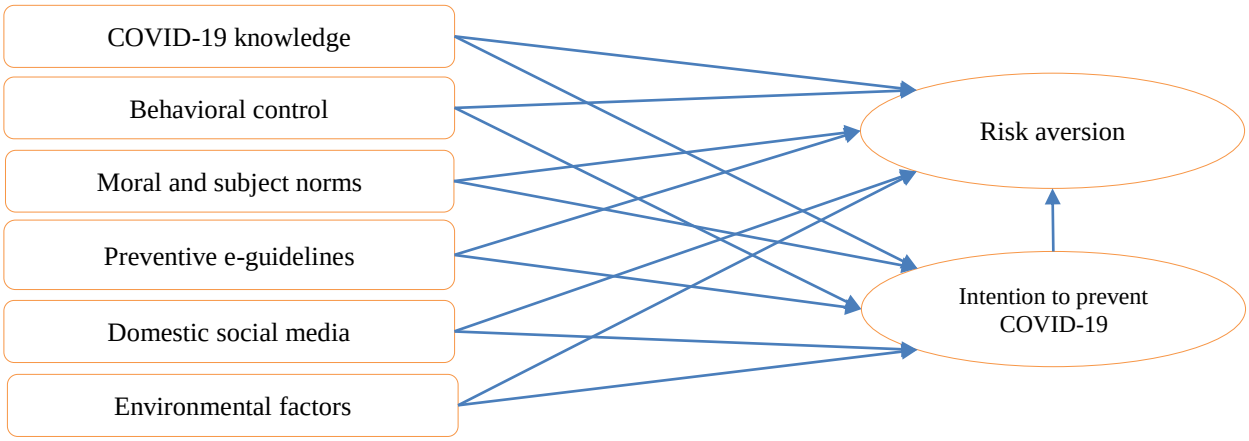

Figure 4. Proposed research model

3. Methodology

This study was conducted in two phases: a preliminary study and a formal study (Figure 5).

3.1. Preliminary Study

The research utilized a group discussion method involving 15 individuals living and working in Vietnam during the COVID-19 outbreak. Drawing upon the research of Raza et al. [15] and Xie et al. [31], the study developed a draft scale for the research concepts in the theoretical model. Based on the feedback received, the researchers refined the scale to conduct a preliminary quantitative assessment to test the reliability and content validity of the scales.

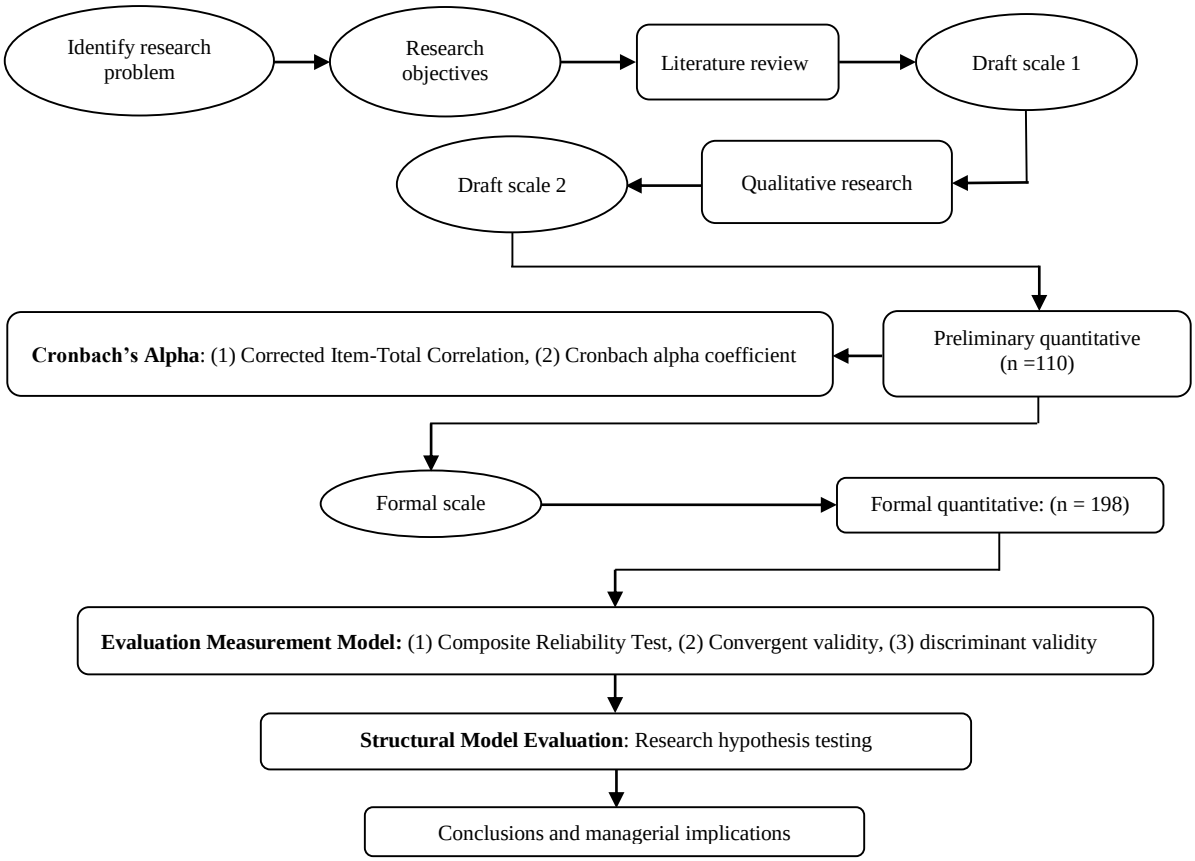

Figure 5. Research process

3.2. Formal Study

Preliminary Quantitative Assessment:

The study conducted a preliminary quantitative assessment with a sample size of 110 observations to test the reliability of the scales using Cronbach's Alpha coefficient. The scales in this study have been adjusted and developed, thus necessitating the need for a preliminary quantitative assessment.

Formal Quantitative Assessment:

Survey Participants: The questionnaire was sent online through a link to the general public. Two hundred-one responses were received and used in the formal research study.

***Sampling Method*:** The sample for the formal research study was collected using a convenient sampling method, conducting an online survey through Google Forms 365. After obtaining consent and survey support, the survey link was sent to the participants. The survey was conducted from January 3, 2022, to January 7, 2022. The survey results can be accessed through the provided link.

***Data Analysis Method*:** Using the PLS-SEM software, the scales will be evaluated through measurement model analysis and linear structural equation modeling. The research utilizes the Partial Least Squares-Structural Equation Modeling (PLS-SEM) technique for data processing, as it allows for small sample sizes. In assessing the measurement model, the research analyzes the reliability using Cronbach's Alpha, composite reliability, and average variance extracted to test the reliability and convergent validity of the scales. In evaluating the structural model, the research employs PLS Bootstrapping with 5000 resamples using the determination coefficient (R^2) and predictive relevance (Q^2) to test the research hypotheses.

3.3. Scale Measurement

The theoretical model has eight research concepts: Covid-19 knowledge, behavior control, moral norms and subjective standards, prevention electronic guidelines, social media, environmental factors, intention to prevent Covid-19, and risk aversion (Table 1). The above scales are inherited from the study of Raza et al. [15], while the social media scale is inherited from the study of Xie et al. [31]. Observed variables are measured using a 5-level Likert scale: (1) Strongly Oppose, (2) Oppose, (3) Neutral, (4) Agree, and (5) Strongly Agree.

Table 1. Scale of research concepts in the model

Constructs	Symbols	No. observations	Scale source
Covid-19 Knowledge	COK	7	Raza et al. [15]
Behavior control	BC	3	Raza et al. [15]
Moral norms and subjective norms	MSN	6	Raza et al. [15]
Government Preventive Electronic Guidance	PEG	4	Raza et al. [15]
Social Media	IPID	4	Xie et al. [31]
Environmental factors	EF	3	Raza et al. [15]
Intentions to prevent Covid-19	IPC	5	Raza et al. [15]
Risk aversion	RA	5	Raza et al. [15]

3.4. Preliminary Quantitative Results

Preliminary results show that the scales in the study model all have Cronbach's Alpha (α) coefficient greater than 0.6. Specifically, the α coefficient of risk aversion is 0.904, the intention to prevent the COVID-19 is 0.946, COVID-19 knowledge is 0.922, behavior control is 0.930, moral standards and subjective standards are 0.955, the Government's electronic guidance is 0.966, environmental factors are 0.911, social media is 0.962. By the standards of Hair et al. [32], the scales are all guaranteed reliability.

4. Results and Discussion

4.1. Research Sample Statistics

The survey participants primarily consisted of females, with 144 responses, accounting for 72.7% of the total, while males accounted for 54 responses, representing 27.3% (Table 2 and Figure 6).

Table 2. Sample characteristics

Characteristics		Frequency	(%)
Gender	Male	54	27.3%
	Female	144	72.7%
Age	Under 25	183	92.4%
	25-40	12	6.1%
	41-60	2	1.0%
	Over 60	1	0.5%
Education	Below Intermediate	6	3.0%
	Intermediate	11	5.6%
	College	17	8.6%
	Undergraduate degree	162	81.8%
	Master	0	0%
	Doctor	2	1.0%
Profession	Worker	7	3.5%
	Teacher	1	0.5%
	State officials	2	1.0%
	Office staff	9	4.5%
	Housework	3	1.5%
	Student	166	83.8%
	Driver	1	0.5%
	Others	9	4.5%
Place of residence	Rural	39	19.7%
	Town	159	80.3%

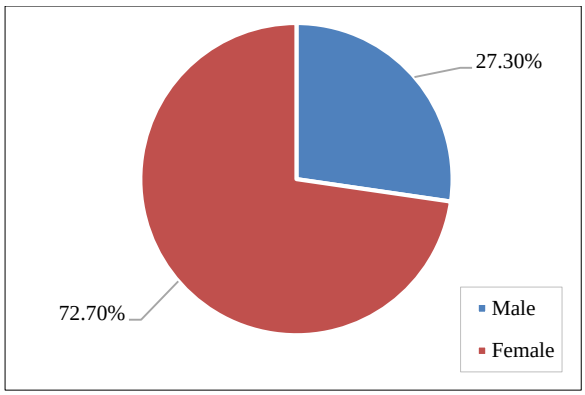

Figure 6. Gender ratio

In terms of age distribution, 183 participants were under the age of 25, accounting for 92.4%; 12 participants were between the ages of 25 and 40, representing 6.1%, 2 participants were between the ages of 41 and 60, accounting for 1%, and 1 participant was over the age of 60, representing 0.6% (Figure 7).

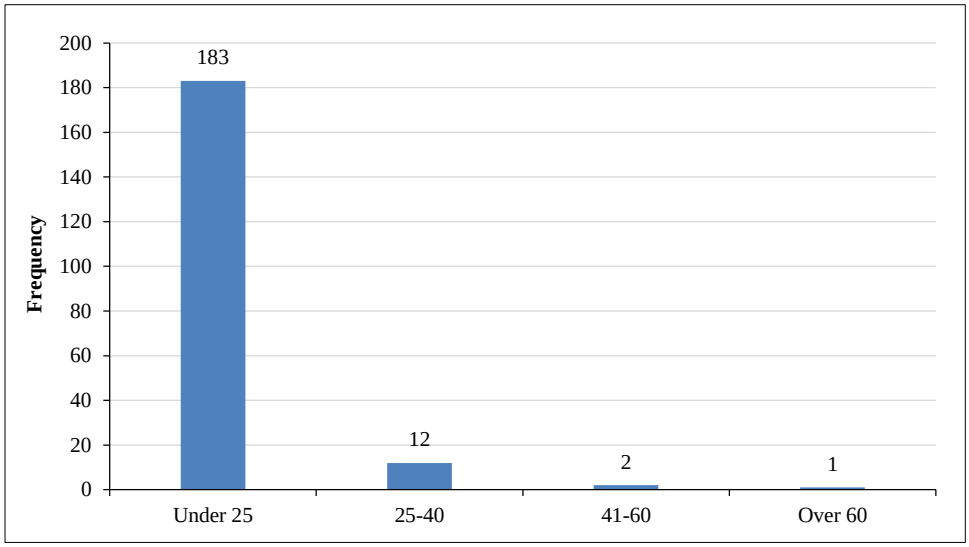

Figure 7. Age distribution

Regarding educational background, 6 participants had education below the intermediate level (3%), 11 participants had intermediate education (5.6%), 17 participants had college education (8.6%), 182 participants had university education (81.8%), and 2 participants held doctoral degrees (1%) (Figure 8).

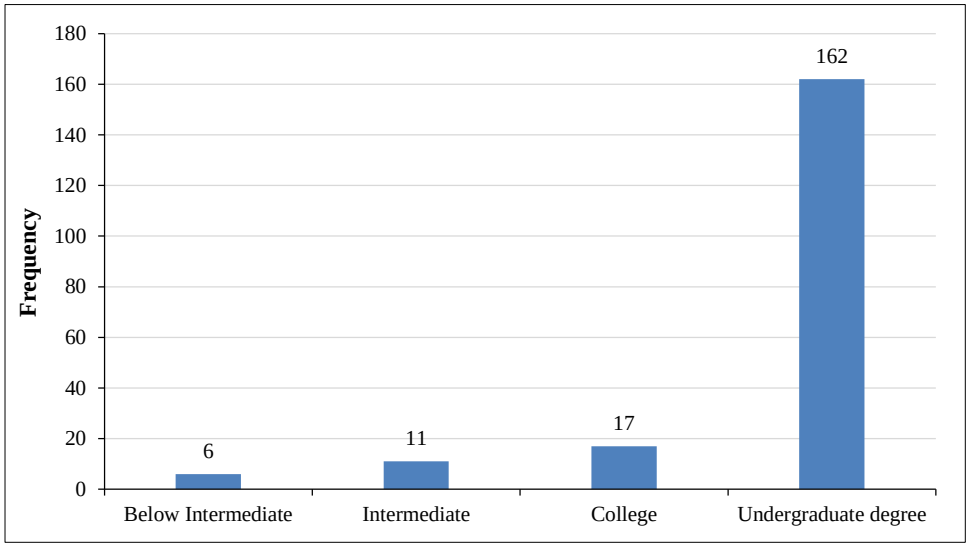

Figure 8. Distribution of educational qualifications

Most survey participants were students, with 166 individuals accounting for 83.8%, while the remaining 16.2% represented various other professions, including workers, teachers, government officials, office staff, and homemakers (Figure 9).

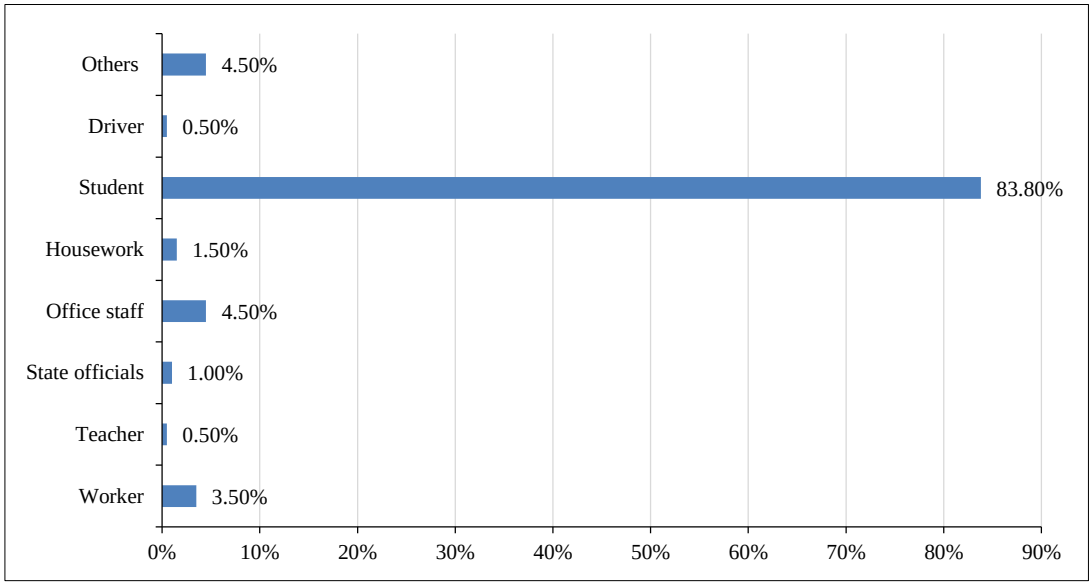

Figure 9. Occupation ratio

The survey participants were predominantly from urban areas, with 159 individuals representing 80.3%, while 39 were from rural areas, accounting for 19.7% (Figure 10).

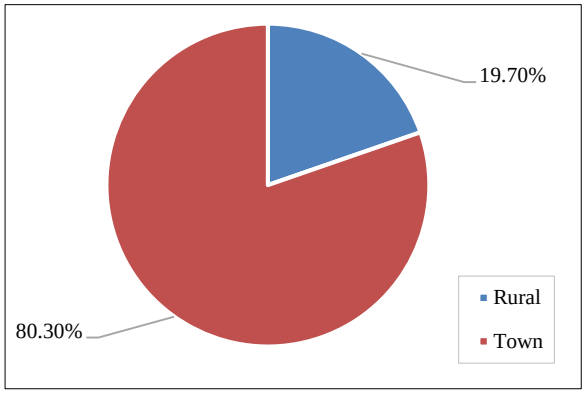

Figure 10. Residence ratio

4.2. Common Bias Method

Due to the potential for response bias and the threat to the validity of the results caused by the Common Method Bias, the study employed Harman's test to assess method bias. A factor was extracted using exploratory factor analysis (EFA) through the "principal axis factoring" technique in SPSS. The results revealed four factors with eigenvalues greater than 1, and the first factor explained 48.24% of the variance. These findings indicate no evidence of method bias, as the first factor does not account for most of the variance [33].

4.3. Evaluation of the Measurement Model

Table 3 presents Cronbach's alpha reliability, Composite Reliability (CR), Average Variance Extracted (AVE) tests of the scales in the model. All measurement scales in the study have Cronbach's Alpha (α) coefficients and composite reliability exceeding the minimum threshold allowed: $\alpha_{\text{Risk aversion}} = 0.911$; $\alpha_{\text{Intention to prevent Covid-19}} = 0.929$; $\alpha_{\text{COVID-19 Knowledge}} = 0.928$; $\alpha_{\text{Environmental factors}} = 0.975$, $\alpha_{\text{Social Media}} = 0.959$, $\alpha_{\text{Moral norms and subjective norms}} = 0.948$, và $\alpha_{\text{Electronic Guidance}} = 0.97$. Composite reliability (CR): $CR_{\text{Risk aversion}} = 0.935$; $CR_{\text{Intention to prevent COVID}} = 0.946$; $CR_{\text{COVID-19 Knowledge}} = 0.943$; $CR_{\text{Environmental factors}} = 0.922$, $CR_{\text{Social Media}} = 0.97$, $CR_{\text{Moral norms and subjective norms}} = 0.959$, và $\alpha_{\text{Electronic Guidance}} = 0.977$ are all greater than 0.6 [32]. The majority of the scales in this study were in the range of [0.75-0.95], so the scales achieved good reliability. According to the average variance extract (AVE) of the scales are all greater than 0.5: $AVE_{\text{Risk aversion}} = 0.744$; $AVE_{\text{Intention to prevent COVID-19}} = 0.778$; $AVE_{\text{COVID-19 Knowledge}} = 0.702$; $AVE_{\text{Environmental factors}} = 0.798$, $AVE_{\text{Social Media}} = 0.89$, $AVE_{\text{Moral norms and subjective norms}} = 0.794$, and $\alpha_{\text{Electronic Guidance}} = 0.893$. Therefore, the scales in the research model are reliable according to the standards of Hair et al. [32].

Table 3. Test the scales

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
BC	0.935	0.936	0.958	0.885
COK	0.928	0.934	0.943	0.702
EF	0.875	0.906	0.922	0.798
IPC	0.929	0.93	0.946	0.778
IPID	0.959	0.959	0.97	0.89
MSN	0.948	0.954	0.959	0.794
PEG	0.970	0.97	0.976	0.893
RA	0.911	0.928	0.935	0.744

The results displayed in Table 4 indicate that the factor loadings of all retained observed variables are above 0.7, except for the observed variables "Social distancing is crucial in preventing the spread of Covid-19" and "RA4- I avoid crowded places and stay at home" which have slightly lower but not significantly different loadings below 0.7. These findings are reflective in nature and advisory in nature; they do not have mandatory significance. Removing these two observed variables would compromise the content validity of the measurement scale. Therefore, these observed variables are included in the formal study. Thus, the observed variables used in the research model meet the convergence criteria according to Hair et al. [32].

Table 4. Statistical indicators of scales

Symbols	Items	Mean	SD	Loading factors
BC1	I possess the skills to implement preventive measures against Covid-19.	3.934	0.894	0.926
BC2	I am capable of implementing preventive measures.	4.040	0.881	0.940
BC3	I believe that I will continue to adhere to preventive measures as long as the pandemic persists.	4.035	0.884	0.955
COK1	Covid-19 is transmitted between individuals through close contact.	4.162	0.890	0.861
COK2	Covid-19 is transmitted through common touchpoints such as elevators, ATMs, and entrances.	4.051	0.957	0.822
COK3	Covid-19 is transmitted between individuals through direct physical contact, such as shaking hands and handling goods.	4.086	0.968	0.830
COK4	Common symptoms of Covid-19 include fever, dry cough, sneezing, body aches, and difficulty breathing.	4.298	0.886	0.905
COK5	Covid-19 can be prevented if we know the importance of frequent handwashing and maintaining personal hygiene.	4.081	0.939	0.836
COK6	Covid-19 enters the body through the nose, mouth, and eyes.	4.222	0.877	0.903
COK7	Social distancing is crucial in preventing the spread of Covid-19.	3.848	1.038	0.689
EF1	I believe that the transmission of COVID-19 is influenced by environmental factors such as temperature, humidity, rainfall, and others.	3.803	1.008	0.903
EF2	I think it can be challenging to use masks for COVID-19 prevention during the summer season.	3.525	1.254	0.858
EF3	I believe that the transmission of COVID-19 decreases as the temperature rises.	3.616	1.089	0.917
IPC1	I am determined to implement preventive measures if any future outbreaks occur.	4.212	0.862	0.848
IPC2	I am willing to undergo quarantine to prevent the spread of a pandemic.	4.237	0.921	0.894
IPC3	I intend to propose preventive measures to others.	4.131	0.866	0.852
IPC4	I plan to adopt a healthy lifestyle even after the pandemic subsides.	4.207	0.895	0.905
IPC5	I am planning to implement preventive measures for Covid-19 during the current outbreak.	4.227	0.861	0.910
IPID1	The impact of pandemic-related information from social media platforms such as Facebook, Zalo, Viber, and others can be significant	3.843	0.922	0.924
IPID2	The impact of pandemic-related information from television can be influential in spreading awareness and delivering updates to a large resident	3.909	0.900	0.964
IPID3	The impact of pandemic-related information from the press can have a profound effect on public perception and understanding of the situation.	3.884	0.905	0.957
IPID4	The impact of pandemic-related information from phone messages can be informative	3.798	0.974	0.926
MSN1	I am currently implementing preventive measures as advised by healthcare experts.	4.101	0.847	0.920
MSN2	I have encouraged my colleagues, friends, and neighbors to adopt preventive measures as well.	4.015	0.873	0.921
MSN3	I take the responsibility of ethical conduct to prevent others from getting infected if I were to contract the disease.	4.101	0.853	0.927

MSN4	My moral obligation includes providing masks and disinfectants to others if I become infected.	3.848	1.014	0.790
MSN5	If I experience any symptoms, it is my duty to inform the relevant health authorities.	4.162	0.884	0.897
MSN6	I have the responsibility to apply preventive measures not only for myself but also for others.	4.172	0.877	0.885
PEG1	I have the responsibility to apply preventive measures not only for myself but also for others.	3.995	0.924	0.931
PEG2	The government's electronic guidelines on prevention are proactive.	4.030	0.915	0.972
PEG3	The government's electronic guidelines on prevention are motivated by encouragement.	3.975	0.950	0.961
PEG4	The government's electronic guidelines are the primary source for implementing preventive measures.	3.965	0.950	0.953
PEG5	If I experience any symptoms, it is my duty to inform the relevant health authorities.	4.131	0.872	0.904
RA1	I am currently implementing preventive measures to keep myself healthy.	4.318	0.896	0.919
RA2	I am implementing preventive measures to keep my children/parents/siblings/spouse healthy.	4.338	0.866	0.932
RA3	I advise my children/parents/siblings/spouse to apply preventive measures.	4.308	0.865	0.856
RA4	I avoid crowded places and stay at home.	4.000	1.030	0.672
RA5	I am practicing social distancing.	3.586	1.247	0.906

Table 5 presents the results of validating the discriminatory value of latent variables in the model using the Fornell-Larcker criterion according to Fornell & Larcker [34]. The results show that all the square root values of Average Variance Extracted (AVE) for each research variable are more significant than the correlation coefficient between that variable and the remaining variables in the model. Therefore, the measurement scales of the research variables all demonstrate discriminant validity.

Table 5. Discriminant validity testing (Fornell – Lacker

	BC	COK	EF	IPC	IPID	MSN	PEG	RA
BC	0.941							
COK	0.798	0.838						
EF	0.514	0.606	0.893					
IPC	0.779	0.785	0.519	0.882				
IPID	0.660	0.659	0.547	0.655	0.943			
MSN	0.857	0.807	0.550	0.840	0.682	0.891		
PEG	0.774	0.777	0.586	0.770	0.741	0.828	0.945	
RA	0.764	0.818	0.539	0.825	0.609	0.831	0.761	0.862

4.4. Structural Model Evaluation

The results of the model estimation by the Bootstrapping method with a sample size of 5000 are shown in Figure 11 and Table 5.

Table 6. Hypothesis test results

Hypotheses	Path coefficients	Bootstrapping	STDEV	T	P Values	Conclusion
		Direct effects				
H11	COK → IPC	0.241**	0.097	2.410	0.016	Accepted
H12	COK → RA	0.318***	0.089	3.517	0.000	Accepted
H21	BC → IPC	0.083	0.087	0.996	0.319	Rejected
H22	BC → RA	-0.004	0.088	0.019	0.985	Rejected
H31	MSN → IPC	0.439***	0.118	3.847	0.000	Accepted
H32	MSN → RA	0.272**	0.134	2.110	0.035	Accepted
H41	PEG → IPC	0.12	0.093	1.185	0.236	Rejected
H42	PEG → RA	0.092	0.094	0.855	0.393	Rejected
H51	IPID → IPC	0.061	0.051	1.235	0.217	Rejected
H52	IPID → RA	-0.063	0.048	1.336	0.182	Rejected
H61	EF → IPC	-0.013	0.042	0.337	0.736	Rejected
H62	EF → RA	0.022	0.037	0.556	0.578	Rejected
H7	IPC → RA	0.309***	0.091	3.443	0.001	Accepted

Indirect effects					
EF → IPC → RA	-0.004	0.013	0.333	0.739	
COK → IPC → RA	0.075*	0.039	1.860	0.063	Accepted
BC → IPC → RA	0.025	0.028	0.952	0.341	
PEG → IPC → RA	0.035	0.029	1.192	0.233	
IPID → IPC → RA	0.019	0.017	1.123	0.262	
MSN → IPC → RA	0.138**	0.059	2.402	0.016	Accepted

Notes: *** p < 0.01, ** p < 0.05, * p < 0.1

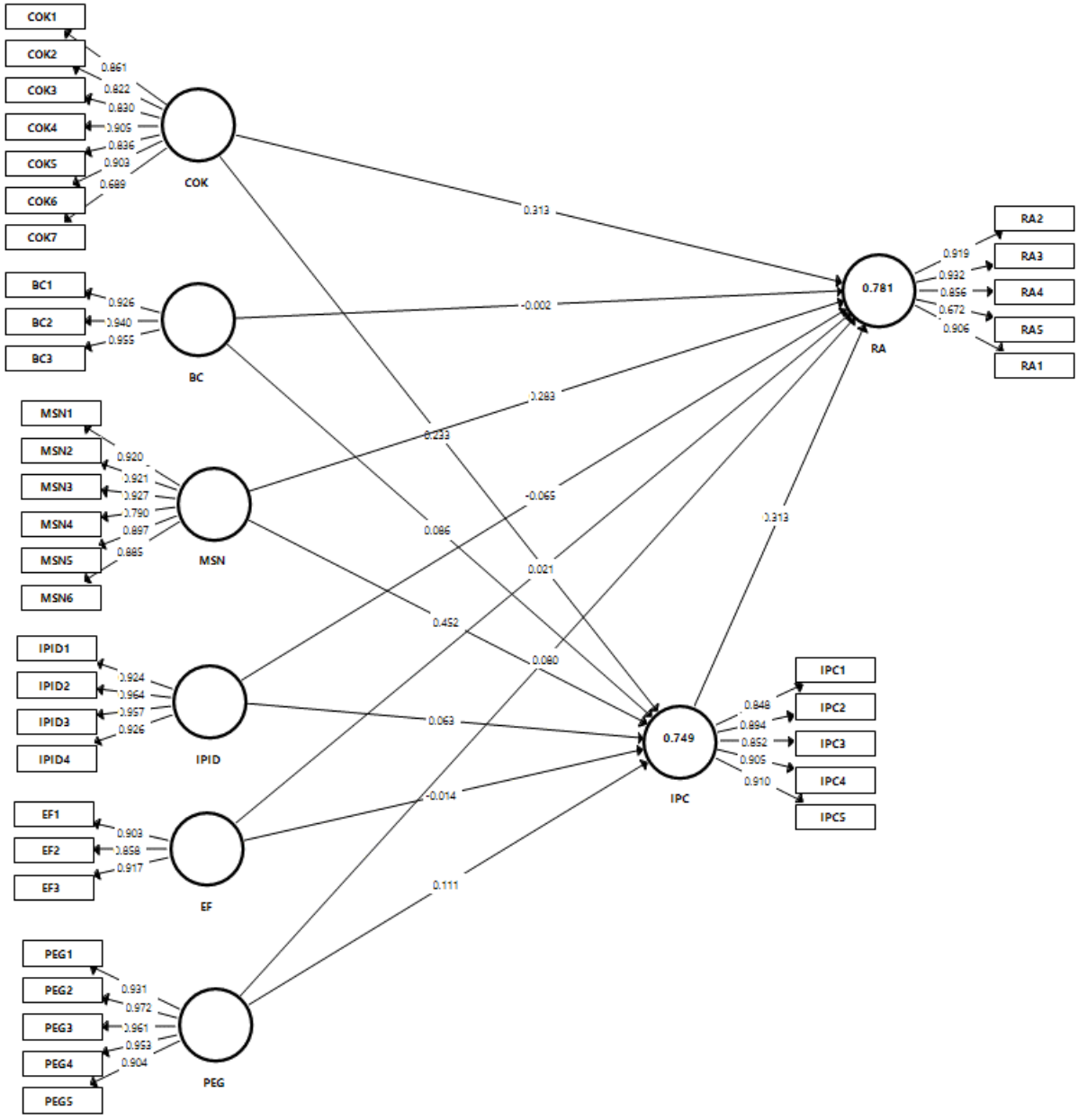

Figure 11. PLS-SEM estimation results

The quality of the proposed model is evaluated through R2 values and Stone-Geisser Index values (Q^2). $R^2_{\text{Intention to prevent COVID-19}}$= 0.749, $R^2_{\text{Risk aversion}}$= 0.781 are greater than 0.26, According to the evaluation criteria proposed by Cohen (2013), coefficient determination is considered strong. The Stone-Geisser values of Q^2 for the preventive intention variable (0.565) and the risk aversion variable (0.563) exceed the threshold of 0.35. According to the evaluation criteria proposed by Chin [35], the model's adequacy is assessed as substantial.

The test results indicate that Hypothesis H11, which states that knowledge of Covid-19 positively impacts the intention to prevent Covid-19 (H11: B = 0.241, p = 0.016 < 0.05), is accepted. Similarly, Hypothesis H12, which states that knowledge of Covid-19 positively impacts risk aversion (H12: B = 0.318, p = 0.000 < 0.01), is also accepted.

The test results indicate that the control behavior does not significantly impact the intention to prevent Covid-19 and risk aversion. Therefore, Hypotheses H21 and H22 are rejected. Next, Hypotheses H31 and H32 state that ethical standards and subjective norms have a positive and statistically significant impact on the intention to prevent Covid-19 and risk aversion (H31: B = 0.439, p = 0.000 < 0.01; H32: B = 0.272, p = 0.035 < 0.05), are accepted. Additionally, Hypotheses H41, H42, H51, H52, H61, and H62, which represent relationships that are not statistically significant (p > 0.1), are sequentially rejected. Finally, Hypothesis H7, stating that the intention to prevent Covid-19 positively impacts risk aversion (B = 0.309, p = 0.001 < 0.01), is accepted.

The Confidence Interval (CI) using the Bootstrapping procedure with 5000 samples was calculated to examine the mediating role of the intention to prevent the spread of the pandemic. The point estimates of the relationships with mediating effects always fall within the confidence intervals and do not include the value of zero, indicating that the point estimates are statistically significant (p < 0.001). From the test results, it is evident that the intention to prevent Covid-19 partially mediates the relationship between COVID-19 knowledge and risk aversion (Indirect effect: B = 0.075, p = 0.063 < 0.1), with the confidence interval (95%, CIs = 0.013; 0.166) not including zero. Similarly, the intention to prevent Covid-19 partially mediates the relationship between moral standards and subjective norms, and risk aversion (Indirect effect: B = 0.138, p = 0.016 < 0.5), with the confidence interval (95%, CIs = 0.041; 0.269) not including zero.

4.5. Discussion

The research findings indicate two factors influencing the intention to prevent Covid-19 and risk aversion: Covid-19 knowledge, moral standards and subjective norms. These results are consistent and similar to the findings from previous studies. For example, the study conducted by Rubin et al. [17] explored the factors influencing the intention to prevent Covid-19 and risk aversion in Pakistan. The research findings also demonstrated that knowledge of Covid-19 and moral standards and subjective norms significantly impact the intention to prevent Covid-19 and risk aversion.

The remaining factors, such as behavior control, government electronic guidance, environmental factors, and the impact of social media, did not significantly influence the intention to prevent Covid-19 and risk aversion. These research findings differ from previous studies, such as Rubin et al. [17]. In their study, behavior control and government electronic guidance were found to impact the intention to prevent Covid-19 and risk aversion. However, the environmental factor, as indicated by Rubin et al. [17], did not have an impact on the intention to prevent Covid-19 and risk aversion. Based on the practical context in Vietnam, these factors can be explained as follows:

Behavior control*:* In the early stages of the pandemic, people were uncertain about this type of disease, which caused them to feel anxious and worried. Upon discovering the outbreak, they took proactive measures to prevent the spread of the disease, such as stockpiling food and essential items and even isolating themselves from society [36]. However, a critical issue to be addressed here is the discriminatory treatment towards those infected with Covid. This behavior creates negative perceptions of infected people, leading to a reluctance to seek healthcare and report their health status. As a result, the disease continues to spread, and the number of fatalities increases. However, at present, the behavior of the population has completely reversed. People are no longer concerned about the disease and are entirely complacent about the risk of infection. They even fail to implement basic preventive measures such as wearing masks, sanitizing, and avoiding crowded places. The government has implemented numerous policies and penalties for violations of disease prevention measures. However, it has been challenging to control the population's behavior effectively. For instance, administrative fines ranging from 1 to 3 million VND have been imposed for actions such as not wearing masks, not sanitizing, not practicing social distancing, and not declaring health status (Decree 124, dated December 28, 2021). Additionally, according to Decree 117 issued by the government, individuals who engage in the following behaviors may face fines ranging from 5 to 10 million VND: concealing their own or others' disease status when infected with a declared infectious disease, not implementing or refusing to implement hygiene, disinfection, and sterilization measures in outbreak areas. This demonstrates that the government's implementation of behavior control measures has not been effective or that controlling behavior has had little impact on the intention to prevent Covid-19 and risk aversion among the population.

Electronic prevention guidelines from the Government: Throughout the pandemic, the Government has implemented various policies to prevent the spread of the disease, including electronic prevention guidelines. However, this measure has proven to be ineffective. Specifically, during the recent outbreak, the Government urged citizens to download the Blue App to trace individuals who had close contact with F0. However, many people hesitated to download the app for fear of losing their personal information. They also expressed concerns about their activities being monitored and their personal lives being affected. In addition, the Government encouraged citizens to declare their health status and domestic travel by scanning barcodes or downloading apps such as PC-Covid and Health Monitoring Diary. However, these declarations were merely perfunctory, as there was no guarantee that citizens would provide truthful information. Moreover, the Government's monitoring and enforcement efforts could have been more active. For instance, when the social distancing period ended due to the severe impact of the pandemic on people's lives and the economy, many

unemployed individuals could not afford rent or food. Consequently, they chose to return to their hometowns to seek refuge. When passing through checkpoints, they only needed to present a vaccination certificate and complete a health declaration on the PC-Covid app. This process was simply a matter of filling in pre-existing information in the system. However, if individuals intended to conceal their illness and provide false information, it would be difficult for the Government to detect. This lax approach has contributed to the virus's rapid spread in rural areas. Therefore, it is evident that the Government's electronic prevention guidelines have not significantly impacted the intention to prevent COVID-19 and alleviate concerns about potential risks.

Social media: During the pandemic, everyone can access information about the COVID situation through news outlets, television, and social media platforms such as Facebook and Zalo. Every day, specific and transparent information about the number of infections, deaths, and recoveries from COVID-19 in Vietnam and worldwide is readily available on social media. For example, during the social distancing period in Vietnam, when everyone had to stay home, people relied on television, social media platforms, and other news sources to stay informed about the social situation and the pandemic. Therefore, it is easy for everyone to stay updated on COVID-19 information. The factor of media coverage does not have a significant impact or influence on the intention to prevent COVID-19 and alleviate people's concerns about the risks involved.

The environmental factor: As previous research by Raza et al. [15] has shown, the environmental factor does not impact the intention to prevent COVID-19. Environmental factors such as air pollution, sea level, and population density are present, but they are beyond our control. In the specific context of Vietnam, each region has a different climate. For example, the northern region experiences cold weather, while the southern region has hot and dry weather. It is impossible to change these characteristics, and it would be unreasonable to expect people in the southern region to wear protective gear all day in the scorching heat. Wearing masks alone can already make breathing difficult for them. Vietnam has densely populated cities and sparser rural areas. It is impractical to ask urban residents to relocate to rural areas to balance population density, as this would only lead to further spread of the disease. Based on these reasons, the environmental factor does not significantly influence the intention to prevent the disease and alleviate people's concerns about the risks involved.

5. Conclusion and Managerial Implications

5.1. Conclusion

COVID-19 has become a significant threat to public health and the global economy, profoundly impacting human lives. The public is compelled to implement preventive measures to control the spread of the disease. In the current pandemic situation, applying protective measures can only be feasible if the community clearly understands COVID-19 knowledge and positively responds to the guidance provided by economic experts. It is essential to fulfill the duty of health declaration, adhering to moral and subjective standards.

The study under scrutiny examines the impact of various influencing factors, such as COVID-19 knowledge, behavioral control, ethical and subjective standards, government electronic prevention guidelines, the influence of media, and environmental factors on the intention to prevent COVID-19 and alleviate concerns about the risks involved. This study utilized an online survey method to gather information from 201 respondents. The research findings reveal that two crucial factors, COVID-19 knowledge, and ethical and subjective standards, significantly influence the intention to prevent COVID-19 and alleviate concerns about the risks involved. Additionally, the novel findings of this study, in comparison to previous research, have confirmed the mediating role of the intention to prevent COVID-19. The intention to prevent COVID-19 partially mediates COVID-19 knowledge, moral and subjective standards, and risk aversion. Therefore, the Vietnamese Government should improve these two factors to enhance the intention to prevent COVID-19 and alleviate concerns about the risks involved.

5.2. Managerial Implications

5.2.1. Increasing Covid-19 Knowledge for Residents

Disseminating knowledge about Covid-19 to the public is crucial. For instance, people should know that Covid-19 can be transmitted through direct contact with an infected person or via shared touchpoints such as elevators, ATMs, and entrances. It can also enter the body through direct contact with respiratory droplets, such as shaking hands or handling packages. Common symptoms of Covid-19 include fever, dry cough, sneezing, body aches, and difficulty breathing. Moreover, Covid-19 can be prevented by practicing regular handwashing, maintaining personal hygiene, and implementing social distancing measures. It is essential to widely disseminate information about Covid-19 to increase the intention to prevent and fear the associated risks, especially for children aged 5 to 11.

Relevant knowledge regarding the transmission, symptoms, and preventive measures of Covid-19 is highly beneficial. Covid-19 serves as a driving force behind the intention to prevent and avoid risks in Vietnam. It is

recommended that the government ensures public awareness of the pandemic. The government should incorporate education on various viral diseases' causes, symptoms, and preventive measures into civic education programs. Additionally, the government should ensure the availability of preventive healthcare items such as masks, sanitizers, and vaccines to meet public demand.

5.2.2. Enhancing Moral and Subjective Standards

Health experts should guide the public on adequately using protective equipment such as masks and sanitizers. Advice and preventive measures proposed by healthcare professionals significantly impact the intention to prevent Covid-19 and the fear of risks among the population. Furthermore, advice and guidance from colleagues, friends, and neighbors on implementing preventive measures are also crucial. Therefore, individuals need to maintain a network of connections to support and exchange information with each other, thus increasing the intention to fight against the pandemic.

Regarding ethical standards, the government should encourage individuals with COVID-19 symptoms to immediately contact healthcare professionals to protect their health and prevent the spread of the virus to others.

5.3. Limitations and Further Research Directions

Firstly, the convenience sampling method used in this study limits the representativeness of the sample population. Therefore, in future research, it is necessary to employ alternative sampling methods, such as stratified sampling, to address the limitations of convenience sampling.

Secondly, the survey participants in this study were predominantly students. Therefore, in future research, it is crucial to diversify the sample population to improve the overall representativeness of the study.

Lastly, due to the limitations of the research sample, it is advisable to increase the sample size in future studies to enhance the reliability of the overall sample population.

6. Declarations

6.1. Author Contributions

Conceptualization, V.V.D.; methodology, T.N.G.; software, T.N.G.; formal analysis, T.N.G.; investigation, N.T.T.; writing—review and editing, T.N.G.; visualization, N.T.T.; supervision, T.D.K. All authors have read and agreed to the published version of the manuscript.

6.2. Data Availability Statement

The data presented in this study are available in the article. Survey results link: https://docs.google.com/spreadsheets/d/1MmDlq7H5obGLGQRem2_I6yjSqibCleX4/edit?usp=sharing&ouid=100935022845011446058&rtpof=true&sd=true .

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6.5. Institutional Review Board Statement

Not applicable.

6.6. Informed Consent Statement

All the study participants signed an informed consent agreeing to provide data and availability for the survey.

6.7. Declaration of Competing Interest

The authors declare that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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