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COVID-19 Preventive action Intention Determinants

-Focused on the Expanded Health Belief Model-

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ABSTACT

The world is experiencing a COVID-19 pendemic fear. Accordingly, Korean university students, who were active in k quarantine, studied what they think about the COVID-19 pendemic.Perceived sensitivity, perceived seriousness, perceived benefit, and perceived disability, which are the main variables of the health belief model, were measured. In addition, questions about self-efficacy, subjective norms, and preventive behavior intention were read and answered online. It was done in a way. This study focused on the perceived sensitivity and perceived severity, perceived benefit, perceived disability, self-efficacy, and extended variables of subjective norms of the health belief model. Perceived sensitivity had a negative effect on preventive behavior intention. it is judged that the more information about COVID-19, the less active it will be in infection prevention actions. Therefore, hypothesis 1 was adopted. The perceived severity had a positive effect on preventive behavior. This means that as the number of COVID-19 infections increases and the number of local outbreaks increases, more proactive actions will be taken. Hypothesis 2 was also adopted. The perceived benefit did not affect the intention of preventive behavior, which seems to have little effect on mask hand washing. Hypothesis 3 was rejected. Perceived disability also did not affect preventive behavior intention, which means that the prolonged COVID-19 infection was not significantly affected by increased indifference to infection and the cost of prevention such as masks.Hypothesis 4 was also rejected. Self-efficacy had a positive effect on the intention of preventive behavior, which means that they are positively and proactively engaged in their own prevention efforts, and their satisfaction with these behaviors is high. The results of this study are expected to be helpful in effectively explaining the preventive behavioral intention of risk of diseases such as COVID-19.

Keywords:COVID19; Extended HBM; Health belief model; Preventive action determinants; Self-efficacy; Subjective norm

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INTRODUCTION

The world's COVID-19 pandemic is affecting all sectors, including society and economy. According to the announcement by the Korea Centers for Disease Control and Prevention, as of August 28, 2020, a total of 19 patients with COVID-19 virus infection in all countries totaled 24,309,589, of which 828,414 died, accounting for 3.4%. The number of cases by country is the

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highest in the United States, 5,860,397, 3,761,391 in Brazil, and 3,3310,234 in India, and 24,309,589 patients with COVID-19 virus infection worldwide (CDC Korea,2020). In Korea, 19,077 patients occurred, and only 316 deaths were reported as a successful case of quarantine (MOHW Korea,2020). Such results in Korea are recorded as exemplary cases for preventing infectious diseases around the world, which is called k quarantine as a result of the people's relatively good adherence to infectious disease prevention rules such as wearing masks, washing hands, and keeping social distances. Until now, studies on COVID-19 have been conducted only a year after the outbreak of COVID-19, so most of the studies on the corona 19 infection itself, and few studies on communication about Corona 19 have been conducted. This study attempted to study from a communication perspective on what college students think about covid-19 and health about the global pendemic situation. This health belief model was developed by American psychologists(Rosenstock I.M. *etal.*,1988). The health belief model is a model that predicts health prevention behavior by presenting the evaluation of perceived risk and disease prevention behavior as major variables. The initial model consisted of an evaluation of the perceived threat to disease and preventive behavior as psychological factors predicting health prevention behavior. After that, behavioral cues and the concept of self-efficacy were added to enhance the explanatory power of the model (Rosenstock I.M. *etal.*,1988). A detailed description of each variable is as follows. First, perceived sensitivity is a belief in the likelihood that an individual will be infected with a specific disease (Champion,V.L. *etal.*,2008). This increases the intention to take preventive action if individuals are sensitive to the possibility of contracting the disease (Cho,S.Y.,2011). Applying this to COVID-19, the higher the perceived sensitivity, the higher the willingness for prevention and screening. Second, perceived severity is the perception of how serious it will be if you have a disease or if you do not receive treatment. Or, if you already have a disease, it is serious about death, disability pain, loss of job socially, problems in family life and social relations, etc. when left untreated, and the combination of sensitivity and severity is perceived threat. appear. In other words, the more serious you think about COVID-19, the higher your intentions for prevention and screening will rise. Third, perceived benefits are those expected through prevention and screening actions. The higher the perceived benefit, the higher the intention for prevention and examination. Fourth, perceived disability refers to the difficulty an individual feels in performing the prevention/checkup behavior. For example, the cost of the prevention and checkup behavior, possible side effects, discomfort, and lack of time can be cited (Champion.V.L.,*etal.*,2008). Fifth, self-efficacy refers to the level of belief of an individual who can perform and control actions necessary for a situation (Bandura.A.,1977). Sixth, subjective norm means perception of the surrounding environment and pressures of others in decision making (Ajzen,I.,1991). In fact, in previous studies, subjective norms had an important influence in predicting intentions for specific actions (N.M. Askelson *etal.*,2010). Based on these previous studies, the research hypothesis was established as follows.

Research Hypothesis 1.
Perceived sensitivity to COVID-19 will have a positive (+) effect on COVID-19 prevention behavioral intention.
Research Hypothesis 2.
The perceived severity of COVID-19 will have a positive (+) effect on the COVID-19 preventive behavior intention.
Research Hypothesis 3.
The perceived benefit of COVID-19 will have a positive (+) effect on the COVID-19 preventive behavior intention.
Research Hypothesis 4.
Perceived impairment for COVID-19 will negatively affect the COVID-19 preventive behavioral intention.
Research Hypothesis 5.
Subjective norms for COVID-19 will have a positive (+) effect on COVID-19 preventive

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behavioral intentions.
Research Hypothesis 6.
Self-efficacy against COVID-19 will have a positive (+) effect on COVID-19 prevention behavioral intention.

MATERIALS & METHODS

As shown in table1, a survey was conducted through Google Survey for 2 weeks from June 15, 2020. The survey respondents were focused on university students in the Chungnam region of Korea. As shown in Table 1, the number of survey respondents was 176, 73 male students, 41.5%, and 103 female students, 58.5%. Looking at the distribution by grade, the second year was the most with 70 students and 39.8%, followed by the fourth year with 61 students and 34.7%, and the third year with 36 students and 20.5%. Showed the least.

Table 1: Characteristics of research subjects

Clasification		No. of cases	%
Total		176	100.0
Gender	Male	73	41.5
	Female	103	58.5
Grade	1Grade	9	5.1
	2Grade	70	39.8
	3Grade	36	20.5
	4Grade	61	34.7

Measurement

Perceived sensitivity, perceived seriousness, perceived benefit, and perceived disability, which are the main variables of the health belief model, were measured. In addition, questions about self-efficacy, subjective norms, and preventive behavior intention were read and answered online. It was done in a way. Questions were revised and supplemented based on previous studies, and were measured on a 1-5 Likeard scale. In addition, demographic variables such as grade and gender and the degree of awareness of the severity of COVID-19 were measured as control variables. The health belief model consists of perceived sensitivity and perceived severity, perceived benefit and perceived disability. In this study, the perceived sensitivity was manipulated to a degree of likelihood that COVID-19 19 could increase preventive behavior against COVID-19 19, and the perceived severity was manipulated to the degree of severity of the negative consequences that could occur due to COVID-19 19. I did. Therefore, previous studies (B.K. Lee *etal.*,2008; Z.Sheng.,2015) were referenced.

Variables

It consisted of 3 questions of perceived sensitivity and 3 questions of perceived severity, and each question was measured from '1 point: not at all' to '5 points: very yes' through a 5-point likert scale. Looking at the main questions, in the case of perceived sensitivity: ①I am relatively more likely to be affected by COVID-19 than others, ②I am always living in an environment exposed to COVID-19, ③I am at risk of COVID-19. It is likely to be exposed, and the perceived severity is as follows. ①COVID-19 can affect my health, ②COVID-19 can affect my maintaining a

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healthy life, ③Neglecting COVID-19 can put my health at risk. The perceived benefit was measured to the extent that wearing a mask helps prevent COVID-19, and was composed of a total of 3 questions. Each question was measured from '1 point: not at all' to '5 points: very much' through a 5-point likert scale, and the main questions are as follows.①I think wearing a mask is effective in preventing COVID-19 19 infection, ②I think wearing a mask can help prevent diseases caused by COVID-19 19, ③I think wearing a mask can protect the respiratory system. The main question of perceived disability is, after asking the question,'What is the biggest difficulty in relation to COVID-19 preventive behavior?' ①COVID-19 19 prolongation, ② Management of masks, etc. It consisted of discomfort or behavior constraints. The subjective norms consisted of 2 questions. Each question was measured from '1 point: not at all' to '5 points: very much' using a 5-point likert scale. The main questions are as follows. ①My friends think I should wear a mask to prevent COVID-19 ②My family thinks that I should wear a mask to prevent COVID-19.

Self-efficacy consisted of a total of 3 questions. Each question was measured from 1 point: not at all to 5 points: very yes through a 5-point likert scale, and the higher the overall average score, the higher the self-efficacy was evaluated.The main questions are as follows. ①I am not difficult to wear a mask to block COVID-19, ②I am not difficult to wear a mask to prevent diseases caused by COVID-19, ③I am not difficult to wear a mask to protect the respiratory system not. The COVID-19 preventive action intention was composed of a total of 3 questions, and was measured from 1 point: not at all to 5 points: very yes through a 5-point likert scale Therefore, the higher the overall average score, the higher the intention to prevent COVID-19 is evaluated. The main questions are as follows. ①I am willing to wear a mask to reduce the health impact of COVID-19 on days when the COVID-19 alert is high, ②I will refrain from going out to reduce the health impact of COVID-19 during COVID-19 There is, ③I am willing to refrain from meetings and public places to reduce the health impact of COVID-19.

RESULTS AND DISCUSSION

The statistical package AMOS 18.0 was used to verify this study, and the maximum likelihood estimation method was used. In order to verify the research model, the measurement model was verified, the suitability of the concept composition was examined, and the structural model was analyzed. As shown in Table 2, as a result of examining the skewness and kurtosis of variables included in the model to verify the multivariate normal distribution, it was confirmed that the normal distribution did not exceed the general standards of skewness 3.0 and kurtosis 10.0.

As shown in Table 2, Chromebach's alpha value must exceed 0.7 to secure the degree of internal consistency. The perceived sensitivity of the health belief model was .778, the perceived seriousness was .840, the perceived benefit was .875, and the perceived disability was .754, which exceeded the standard and secured internal consistency. The self-efficacy was .914, the subjective norm was .889, and the preventive behavior intention was .819, ensuring internal consistency.

Table 2: Descriptive statistics and reliability analysis results of major variables

Variable		No. of First items	No. of final items	Ave.	Standard Deviation	Skewness	Kurtosis	Cronbach's α
HBM Model	Perceived susceptibility	3	2	2.901	1.070	0.181	-0.610	.778
	Persived severity	3	3	4.328	0.789	-1.417	2.610	.840
	Perceived benefit	5	5	4.385	0.555	-0.692	-0.110	.875

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	Perceived barrier	3	3	2.807	0.981	0.236	-0.521	.754
Self-efficacy		6	6	4.562	0.593	-1.522	2.255	.914
Subjective norm		6	6	4.590	0.525	-1.207	0.724	.889
Preventive Action Intention		5	5	4.536	0.504	-1.232	1.071	.819

Table 3: Confirmatory factor analysis result

	SF	EV	SE	CR	SMC	Concept Reliability	AVE
Perceived susceptibility	0.867	0.380	-	-	0.752	.547	.713
	0.738	0.570	0.128	6.006	0.545		
Perceived severity	0.841	0.283	-	-	0.708	.703	.759
	0.886	0.167	0.079	11.967	0.785		
	0.684	0.378	0.073	9.545	0.467		
Perceived benefit	0.706	0.247	-	-	0.499	.755	.833
	0.739	0.232	0.117	9.126	0.546		
	0.828	0.128	0.105	10.148	0.686		
	0.874	0.099	0.108	10.612	0.764		
	0.682	0.249	0.111	8.442	0.464		
Perceived barrier	0.507	0.974	-	-	0.257	.552	.738
	0.827	0.518	0.304	5.996	0.684		
	0.814	0.449	0.268	6.031	0.662		
Self efficacy	0.783	0.224	-	-	0.614	.745	.884
	0.903	0.065	0.065	13.864	0.815		
	0.658	0.354	0.094	9.264	0.433		
	0.881	0.099	0.073	13.402	0.776		
	0.917	0.063	0.068	14.181	0.842		
	0.664	0.343	0.093	9.363	0.441		
Subjective norm	0.684	0.225	-	-	0.468	.773	.883
	0.695	0.270	0.131	8.627	0.483		
	0.683	0.168	0.101	8.488	0.466		
	0.710	0.185	0.111	8.806	0.504		
	0.785	0.222	0.139	9.657	0.616		
	0.894	0.069	0.109	10.85	0.800		
Preventive Action Intention	0.790	0.104	-	-	0.624	.670	.826
	0.866	0.078	0.092	12.755	0.750		
	0.635	0.245	0.113	8.714	0.404		
	0.575	0.443	0.145	7.774	0.331		

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	0.586	0.336	0.128	7.938	0.344		

As shown in Table 3, in order to examine the convergent validity of the latent variable through confirmatory factor analysis, construct reliability (CR) and average variance extracted (AVE) are calculated. I did. Concentrated validity indicates the degree of correlation between two or more measurement items for one latent variable, and if the conceptual reliability is 0.7 or more and the average variance extraction index is 0.5 or more, it is judged that there is a concentration validity.
In Table 3, first looking at the conceptual reliability of the research variables, the perceived sensitivity factor, which is a health belief model factor, was .547, the perceived severity factor was .703, the perceived benefit factor was .755, and the perceived obstacle factor was. 552, self-efficacy was .745, subjective normative factor was .773, and preventive behavior factor was .670, respectively. All research variables showed high conceptual reliability of 0.7 or more. Next, looking at the mean variance extraction value, the perceived sensitivity factor, which is a health belief model factor, was .713, the perceived severity factor was .759, the perceived benefit factor was .833, and the perceived obstacle factor was .738. The efficacy was .884, the subjective normative factor was .883, and the preventive behavior factor was .826, respectively. All study variables showed a high AVE value of 0.5 or higher. Through such conceptual reliability and review of the average variance extraction value, the concentration validity of the research variables was confirmed. In addition, when looking at the discriminant validity of the research variables, discriminant validity indicates how different one latent variable is actually from the other, and the evaluation method is the most conservative method. If it is greater than the square of the coefficient, it is considered to have discriminant validity.

Table 4: Correlation result

Clasification		HBM				Self efficacy	S..N	P.A.I.
		Perceived susceptibility	Perceived severity	Perceived benefit	Perceived barrier			
HBM	Perceived susceptibility	*.547*						
	Perceived severity	0.368***	*.703*					
	Perceived benefit	0.018	0.171*	*.755*				
	Perceived barrier	0.176*	-0.007	-0.084	*.452*			
Self -efficacy		-0.001	0.180*	0.453***	-0.163*	*.745*		
Subjectve norm		0.046	0.263***	0.559***	-0.062	0.761***	*.773*	
Preventive Action Intention		-0.053	0.273***	0.480***	-0.039	0.736***	0.738***	*.670*

* p<.05, ** p<.01, *** p<.001.

Looking at the correlation analysis as shown in Table 4, the self-efficacy, which is a variable of the extended health belief model, is .736, and the subjective norm is .738, showing a high correlation. The perceived severity was .273 and the perceived benefit was .480, indicating a correlation. On the other hand, perceived sensitivity and perceived disability did not affect preventive behavior intention. There was no correlation for perceived obstacles such as perceived sensitivity due to excessive interest in disease or cost of mask management.

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Table 5: Regression analysis result

Path	β	S.E.	t-value
Perceived susceptibility → PAI	-.142	.023	-2.359*
Perceived severity → PAI	.185	.029	3.215**
Perceived benefit → PAI	.092	.050	1.510
Perceived barrier → PAI	.021	.036	.411
Self - efficacy → PAI	.486	.059	5.841***
Subjective norm → PAI	.410	.071	4.708***

GFI=.624, CFI=.684, NFI=.629, RMR=.056

* p<.05, ** p<.01, *** p<.001.

As shown in Table 5,the route analysis results are as follows. Perceived sensitivity had a negative effect on preventive behavior intention. In other words, it is judged that the more information about COVID-19, the less active it will be in infection prevention actions. Therefore, hypothesis 1 was adopted. The perceived severity had a positive effect on preventive behavior. This means that as the number of COVID-19 infections increases and the number of local outbreaks increases, more proactive actions will be taken. Hypothesis 2 was also adopted. The perceived benefit did not affect the intention of preventive behavior, which seems to have little effect on mask hand washing. Hypothesis 3 was rejected. Perceived disability also did not affect preventive behavior intention, which means that the prolonged COVID-19 infection was not significantly affected by increased indifference to infection and the cost of prevention such as masks. Hypothesis 4 was also rejected.Self-efficacy had a positive effect on the intention of preventive behavior, which means that they are positively and proactively engaged in their own prevention efforts, and their satisfaction with these behaviors is high. Hypothesis 5 was adopted. Subjective norms also had a positive effect on COVID-19 prevention behavioral intentions. Here, the operational definition of subjective norms was the degree that people who thought they were important to me wished for me. Therefore, it means that you voluntarily wear a mask in front of people who are considered important. Hypothesis 6 was adopted.

CONCLUSION

This study examined the determinants that influence the intention to prevent COVID-19 through the expansion of the health belief model. The main results are briefly presented as follows. First, the perceived sensitivity to COVID-19 had a statistically significant positive (+) effect on preventive behavior intention. Second, it was found that the perceived severity of COVID-19 had a statistically significant positive (+) effect on the intention to prevent action. Third, perceived benefit did not have a statistically significant positive (+) effect on preventive behavior intention. Fourth, the perceived disability did not have a statistically significant effect on the intention of preventive behavior. Fifth, it was found that subjective norms had a statistically significant positive (+) effect on preventive behavior intention. Sixth, it was found that self-efficacy had a statistically significant and positive effect on preventive behavior intention. This study examined college students' attitudes toward disease prevention through the search for determinants of COVID-19 prevention behavior. The results of this study are expected to be helpful in effectively explaining the preventive behavioral intention of risk of diseases such as COVID-19. However, the limitation of this study is that, considering that COVID-19 is a problem of society as a whole, the limitation of the sample to college students acts as a limitation to the generalization of the study. In consideration of this, subsequent studies will expand the sample more broadly and examine the determinants affecting the COVID-19 preventive behavioral intention, which will lead to a more extensive study.

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