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A Study on the Impact of COVID-19 SMS on Preventive Behavior-Focused on the Confirmed Patients Notification SMS-

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Abstract

Background/Objectives: The Republic of Korea is still a good example of k-prevention which SMS played a big role in real time. Therefore, the effect of SMS and covid 19 preventive behavior was studied.

Methods/Statistical analysis: The survey respondents were focused on university students in the Chungnam region of Korea. The number of survey respondents was 135, 53 male students, 39.3%, and 82 female students, 60.7%. Looking at the distribution by grade, the fourth year was the most with 66 students and 48.9%, followed by the third year with 29 students and 21.5%, and the second year with 22 students and 16.3%.

Findings: Looking at the table3 shaded areas, the CFA result of AVE.5 or less and CR.7 or less, perceived sensitivity and perceived disability, did not secure concentration validity. -As a result of CFA, the main concepts for this study were found to be inappropriate for analyzing the research model. Accordingly, analysis is performed using regression analysis rather than structural equations. The diagonal matrix for each factor in italics is the variance extraction index. The correlation between subjective norm and behavioral intention was highest (r=.703), perceived benefit (r=.655), perceived seriousness (r=.493), perceived sensitivity (r=.491) It also shows a significant relationship with the back. However, there was no significant relationship between perceived disability and behavioral intention. As a result of conducting multiple regression analysis of the concepts constituting the health belief model as an independent variable with behavioral intention as a dependent variable, self-efficacy (β=.439, p<.001) and perceived benefit (β=.321, p) Only<.001) appears to have a significant effect.

Improvements/Applications: The SMS is helpful in preventing one's own health that the perceived benefit affects the preventive behavior. Therefore, the local governments that send the SMS is helpful in the position of the recipient.

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Keywords: Health Belief Model, Notification SMS, Confirmed Patients, Self efficacy, Preventive action, CDC Korea

1. Introduction

In January 2020, the WHO announced the outbreak of a new coronavirus disease to be a Public Health Emergency of International Concern[1]. The Republic of Korea has set an example around the world as an excellent case for preventing corona with k-prevention. As of April 9, 2021, the Korea Corona 19 Vaccination Response Promotion Team announced that 1,113,666 people had received the first vaccination, and 52,136 people had completed the second vaccination. Of the primary vaccinations, 911,228 people received the AstraZeneca vaccine and 2,242,383 Pfizer vaccines. The vaccination rate of Korea's total population is 2.1%, lower than the Asian average of 2.69%[1]. Looking at the current status of COVID-19 vaccinations around the world compiled by Oxford University's Martin School, Korea's vaccination rate relative to the population was 2.1% as of April 7, 2021, ranking only 35 out of 37 OECD countries [2]. The average vaccination rate in Asia is 2.69%, the European average is 13.8%, the North American average is 21.4%, and the South American average is 7.8%. Meanwhile, the authorities said that the number of deaths was decreasing despite the increase in the total number of confirmed cases due to fewer patients in nursing hospitals and nursing facilities due to the effect of vaccination that began in February[3].

The Korean government plans to complete vaccinations for 1.2 million people by the first half of the world despite unstable vaccine supply and demand. However, controversy over the side effects of blood clots from the AstraZeneca vaccine raised concerns about disruption to the plan. AstraZeneca vaccine accounts for about 60% of the amount of vaccines introduced in the second quarter. If AstraZeneca vaccination withholding for those under the age of 60 continues, it will be difficult to

achieve the 12 million vaccination target within the second quarter. The authorities said that 7 million doses of the Pfizer vaccine will be delivered within the second quarter, and that Janssen, Modena, and NovaVax vaccines are also in discussions for early introduction within the second quarter [4].

HBM was created by American psychologists[5]. The health belief model 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. And now, behavioral cues and the concept of self-efficacy were added to enhance the explanatory power of the model [5]. Each variable is as follows. First, perceived sensitivity is a belief in the likelihood that an individual will be infected with a specific disease[6]. This increases the intention to take preventive action if individuals are sensitive to the possibility of contracting the disease[7]. 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. Third, perceived benefits are those expected through prevention and checking actions. The higher the perceived benefit, the higher the intention for prevention and examination. Fourth, Perceived barrier 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[6]. Fifth, self-efficacy refers to the level of belief of an individual who can perform and control actions necessary for a situation[8]. Sixth, subjective norm means perception of the surrounding environment and pressures of others in decision making[9]. In fact, in previous studies, subjective norms had an important influence in predicting intentions for specific actions[10].

In this way, in a situation where covid19 is at the point of re-supplying, pay more attention to the notification SMS of the confirmed case. In the case of disaster messages, CBS (cell Broadcasting Service) is a batch transmission method that does not identify individual GPS. Unlike text, simultaneous transmission uses a simultaneous transmission method. Texts are sent to cell phones with signals in all cities. When a person residing in Seoul visits another area, they receive the local notification SMS, not the Seoul-related disaster message. The disadvantage of using SMS is that it is difficult to send mass messages based on location and it takes a long time to send a large number of messages. Also, the cost is considerable. In some cases, disaster texts come incorrectly. Live in Seoul, but there are also notification SMS about Gyeonggi-do. This is an error that occurs because texts are sent around the base station. The radio waves from the base station reach a maximum of 15 km if there are no obstacles. If the location of the recipient is at the border of a city/county or there are several base stations around, the text sent from each base station is received at once. The fact that there are also kinds of disaster texts. Notification SMS is divided into emergency, emergency, and safety according to the degree of risk. First of all, the corona-related disaster message that we are currently receiving is the safety information message, the lowest level. Messages that can be rejected are mainly related to the route of confirmed persons, refraining from meetings on weekends, and measures to reduce emergency fine dust [3]. The purpose of this study is to conduct research on the effects of the notification letters of corona confirmed patients on preventive behaviors through this study.

Research Hypothesis 1.
Perceived sensitivity has a positive impact on preventive behavior intention
Research Hypothesis 2.
Perceived severity has a positive impact on preventive action intention
Research Hypothesis 3.
Perceived benefit has a positive impact on preventive action intention
Research Hypothesis 4.

Perceived disability has a positive impact on preventive behavior intention
Research Hypothesis 5.

Subjective norms have a positive impact on preventive behavioral intentions
Research Hypothesis 6.

Perceived self-efficacy positively influences preventive behavior intention

2. Materials and Methods

As shown in table 1, a survey was conducted through Google Survey for 3 weeks from November 9, 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 135, 53 male students, 39.3%, and 82 female students, 60.7%. Looking at the distribution by grade, the fourth year was the most with 66 students and 48.9%, followed by the third year with 29 students and 21.5%, and the second year with 22 students and 16.3% showed the least. In addition, when looking at each major, business and economics were the most with 53 students, 39.3%, followed by 42 students in the humanities and social sciences, followed by 31.1%, and 20 students in the arts and physicals fields, respectively, 14.8%.

Table 1: Characteristics of research subjects

Classification		No. of cases	%
Total		135	100.0
Gender	Female	82	60.7
	male	53	39.3
Grade	1Grade	18	13.3
	2Grade	22	16.3
	3Grade	29	21.5
	4Grade	66	48.9
Major	Humanities & Social Sciences	42	31.1
	Business & Economics	53	39.3
	Engineering	20	14.8
	Arts & Physical Education	20	14.8

Measurement

The survey was conducted through a Google survey, and the major variables of the health belief model were perceived sensitivity, perceived seriousness, perceived benefit, and perceived variables. In addition, the effects of perceived subjective norms and perceived self-efficacy on preventive behavior were investigated. Questions were revised 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 could increase preventive behavior against COVID-19 and the perceived severity was manipulated to the degree of severity of the negative consequences that could occur due to COVID-19.

Variables

The perceived vulnerabilities were manipulated to the extent that the confirmation of the notification letter of the COVID 19 confirmed person was likely to be infected with COVID 19. The questionnaire composition is 1. I have a relatively higher probability of being affected by the notification letter of COVID 19 than others. 2. I am always exposed to COVID 19, so be sure to check the notification letters for confirmed cases. 3. I am highly likely to be exposed to the risk of COVID 19, so be sure to check the local notification letter when moving to the area. The perceived severity was manipulated to a degree of severity for the negative consequences that may occur to individuals due to the COVID 19 confirmed notification letter. 1. The COVID 19 confirmed notification letter may affect my health. 2. COVID 19 confirmation letter messages can have an effect on maintaining my healthy life. 3. Neglecting the notification letter of the COVID 19 confirmed person could endanger my health. The perceived benefit was fabricated to the extent that the notification letters of COVID 19 confirmed patients believe that they are helpful in preventing COVID 19 infection, and the composition of the questionnaire is 1. I think that the notification SMS of COVID 19 confirmed patients are effective in blocking COVID 19 infection. 2. I think the COVID 19 confirmed notification SMS is helpful in preventing COVID 19 infection. 3. I can protect my health by paying attention to the notification SMS of COVID 19 confirmed cases. The perceived disability was manipulated by the inconvenience or burden that occurs when the notification SMS of the COVID 19 confirmed person performs COVID 19 preventive actions. 2. When moving to an area, the notification SMS of the confirmed patient reduces the preventive behavior. 3. I don't see the notification text during important times such as class. The subjective norms were manipulated to the extent that they believed that people who were considered important to them would want them to act on COVID 19 prevention. 1. My friends will think that I should pay attention to COVID 19 confirmed notification SMS to prevent COVID 19. 2. My family will think I should pay attention to the COVID 19 confirmed notification SMS. The self-efficacy was manipulated to the extent that the notification letter for COVID 19 confirmed patients was fabricated to the extent that they believed that they could effectively prevent the coronavirus in advance, and consisted of three questionnaires. 1. It is not difficult for me to check the confirmation SMS to prevent COVID 19. 2. It is not difficult for me to check the notification SMS of the local confirmed case when moving to the area to prevent COVID 19 infection. 3. To prevent COVID 19 infection, I frequently check the notification SMS for confirmed cases. The intention of prevention behavior was manipulated by the individual's willingness to perform the actions to minimize the COVID 19 infection prevention, and the questionnaire was composed of three. 1. I will pay more attention to the COVID 19 confirmed notification SMS to prevent COVID 19 infection as the number of confirmed COVID 19 increases. 2. I am willing to refrain from going out to prevent COVID 19 infection when the number of COVID 19 confirmed cases increases. 3. When the number of COVID 19 confirmed cases increases, I will pay attention to the notification SMS of local confirmed cases to prevent COVID 19 infection when moving to the area.

3. Results and Discussion

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

Health Belief Model	Perceived sensitivity	3	3	3.185	0.977	-0.181	-0.690	.760
	Perceived severity	3	3	3.247	1.024	-0.210	-0.388	.818
	Perceived benefit	3	3	3.467	0.951	-0.545	-0.158	.864
	Perceived barrier	3	3	3.035	0.824	-0.455	0.145	.839
Self - efficacy		3	3	3.196	1.058	-0.313	-0.279	.797
Subjective norm		2	2	3.709	0.875	-0.436	0.102	.775
Preventive action intention		3	3	4.032	0.835	-0.873	1.058	.836

As shown in table 2, when looking at skewness (.873~.181) or kurtosis (1.058~.102) based on absolute values, the assumption of normality is not violated. Collinearity problems such as tolerance limits (.473~.898) and VIF (1.119~2.113) were not found.

Table 3: Confirmation factor analysis results

	SF	EV	SE	CR	SMC	AVE	CR
Perceived sensitivity	0.412	0.948			0.257	.521	.636
	0.950	0.150	0.551	4.879	0.624		
	0.818	0.504	0.478	4.792	0.630		
Perceived severity	0.762	0.561			0.717	.519	.718
	0.778	0.495	0.115	8.570	0.783		
	0.791	0.625	0.133	8.696	0.458		
Perceived benefit	0.851	0.327			0.456	.660	.759
	0.872	0.281	0.086	11.855	0.554		
	0.760	0.453	0.085	9.951	0.176		
Perceived barrier	0.865	0.314			0.652	.328	.688
	0.565	0.770	0.161	3.855	0.756		
	-0.313	1.303	0.138	-2.812	0.244		

Self - efficacy	0.857	0.345			0.317	.577	.781
	0.773	0.552	0.108	8.565	0.045		
	0.923	0.127			0.287		
Subjective norm	0.896	0.173	0.075	13.068	0.040	.598	.704
	0.536	1.121	0.118	6.630	0.672		
Preventive action intention	0.900	0.213			0.276	.722	.771
	0.558	0.463	0.067	7.128	0.039		
	0.947	0.100	0.061	16.088	0.020		

Looking at the table3 shaded areas, the CFA result of AVE.5 or less and CR.7 or less, perceived sensitivity and perceived disability, did not secure concentration validity. -As a result of CFA, the main concepts for this study were found to be inappropriate for analyzing the research model. Accordingly, analysis is performed using regression analysis rather than structural equations.

Table 4: Correlation results

Classification		Health Belief Model				Self - efficacy	Subjective norm	Preventive action intention
		Perceived sensitivity	Perceived severity	Perceived benefit	Perceived barrier			
Health Belief Model	Perceived sensitivity	*.521*						
	Perceived severity	0.591***	*.519*					
	Perceived benefit	0.462***	0.474***	*.660*				
	Perceived barrier	-0.095	0.033	-0.068	*.328*			
Self - efficacy		0.453***	0.542***	0.507***	0.141	*.598*		
Subjective norm		0.531***	0.499***	0.626***	-0.154	0.542***	*.577*	
Preventive action intention		0.491***	0.493***	0.655***	-0.069	0.454***	0.703***	*.722*

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

The diagonal matrix for each factor in italics is the variance extraction index. The correlation between

subjective norm and behavioral intention was highest (r=.703), perceived benefit (r=.655), perceived seriousness (r=.493), perceived sensitivity (r=.491) It also shows a significant relationship with the back. However, there was no significant relationship between perceived disability and behavioral intention.

Table 5: Multiple regression analysis results

Path	β	S.E.	t-value	Diagnosis of collinearity	
				Tolerance	VIF
Perceived susceptibility → PAI	.070	.065	.927	.562	1.780
Perceived severity → PAI	.098	.064	1.261	.535	1.868
Perceived benefit → PAI	.321	.068	4.172***	.548	1.824
Perceived barrier → PAI	.029	.061	.477	.894	1.119
Subjective norm → PAI	-.035	.079	-.460	.549	1.823
Self - efficacy → PAI	.439	.061	5.293***	.473	2.113

R^2=.584, Adjusted R^2=.564, F=29.926, p<.000

As a result of conducting multiple regression analysis of the concepts constituting the health belief model as an independent variable with behavioral intention as a dependent variable, self-efficacy (β=.439, p<.001) and perceived benefit (β=.321, p) Only <.001) appears to have a significant effect.

4. Conclusion

Looking at the above research results, it is determined that the confirmed patient's notification SMS is helpful in preventing one's own health that the perceived benefit affects the preventive behavior. Therefore, the local governments that send the confirmed patients notification SMS will send information that is helpful in the position of the recipient. In the future, it is said that KakaoTalk will be switched to notifications, so it is sent in the form of card news to convey the feeling of receiving information benefits to recipients who are bored with text messages for a long time. It also appears that self-efficacy affects preventive behavior, which means that individuals have the belief that they can overcome covid-19. This means that he pays attention to the confirmed patients notification SMS himself, observes the quarantine rules well, and is taking the initiative in social distancing campaigns. However, as the duration of the covid-19 situation is prolonged, fatigue may accumulate and become uncomfortable, so it is considered important to develop various types of content to prevent this. The limitation of this study was that it was not possible to reflect the opinions of various age groups because the study was centered on university students. I hope that future research will develop into a research that collects opinions of all age groups.

5. Acknowledgment

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6. References

1. World Health Organization (WHO). Mental Health and Psychosocial Considerations during the COVID-19 Outbreak. Available online: https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf (accessed on 17 April 2020).

2. https://www.oxfordmartin.ox.ac.uk/search?q=covid19+vaccine

3. http://ncov.mohw.go.kr/

4. https://www.bbc.com/korean/news-56687547

5. Rosenstock, I. M., Strecher, V. J., & Becker, M. H., 1988. Social learning theory and the health belief model. *Health Education Quarterly,* 15(2), 175-183.

6.Champion, V. L., & Skinner, C. S., 2008. The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath(Eds.), Health behavior and health education. *Theory,research, and practice (4th ed,),* SanFrancisco, CA, US: Jossey Bass., 45-65.

7. Cho, S. Y., 2011. Predicting women's cervical cancer prevention behaviors extending health belief model. *Advertising Research*, 91, 348-.377.
http://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE02499940
[Accessed: 8 Aug.2020]

8. Bandura, A., 1977. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review,* 84(2), 191-215.

9. Ajzen, I., 1991. The theory of planned behavior. *Organizational behavior and human decision processes,* 50(2), 179-211.

10. N. M. AskeIson, S. Campo, J. B. Lowe, S. Smith, L. K.Dennis & J. Andsager., 2010. Using the theory of planned behavior to predict mothers' intention to vaccinate their daughters against HPV. *The Journal of School Nursing*, 26(3) , 194-202. DOI: 10.1177/1059840510366022