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Investigating factors affecting COVID-19 vaccination intention among college nursing students using health belief model

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Abstract---This study investigates the current state of vaccination against COVID-19 among nursing students and identifies the factors that affect their vaccination intention. The subjects who agreed and understood the purpose of this study were 2nd year nursing students who have not undergone clinical practice at C University in G City. Data collection online took place from August 30 to September 4, 2021. In this study, the appropriate number of samples was met by using the questionnaire answered by 137 out of 198 students in the final analysis. The data were analyzed using IBM SPSS WIN 25.0 program. As a result of the study, COVID-19 vaccination intention showed a significantly positive correlation with perceived sensitivity ($r=.573$, $p<.001$), perceived seriousness ($r=.564$, $p<.001$), perceived benefit ($r=.747$, $p<.001$), cues to action ($r=.546$, $p<.001$), self-efficacy ($r=.856$, $p<.001$) and a significantly correlation with perceived barrier ($r=-.244$, $p=.004$). Statistically, influencing factors on COVID-19 vaccination intention were self-efficacy ($\beta=.55$, $p<.001$), perceived benefit ($\beta=.28$, $p<.001$), and cues to action ($\beta=.11$, $p=.019$) accounting for 80% of the total change. In other words, the higher the self-efficacy, the higher the perceived benefit, and the higher the cues to action, the higher the vaccination intention of college nursing students. Therefore, in order to increase their vaccination intention against COVID-19, it is thought that a strategy is needed to emphasize self-efficacy and the benefit of vaccines through various educational programs, and to improve the cues to action.

Keywords---COVID-19, vaccination intention, nursing students, health belief model.

Introduction

Research Need

Coronavirus is an RNA virus that can infect alpha and beta with humans and animals, and gamma and delta with animals. In particular, SARS-CoV-2 is the cause of COVID-19, which began in China in November 2019. Clinical symptoms range from asymptomatic to severe, mainly through droplet transmission through the respiratory tract of an infected person. Korea first had a COVID-19 confirmed case on January 20, 2020, but due to the development of transportation, the World Health Organization (WHO) declared COVID-19 an international public health emergency in January 2020, raised the risk to very high in February, and declared it a pandemic in March. In October 2020, it was estimated that about 10% of the world's population was infected in consideration of asymptomatic infections [2]. It is one of the worst infectious diseases in mankind, and the fatality rate varies from 0.1% to 25% due to the global fatality rate, infection status, population age, and various factors, with deaths of nurses and teenagers in their 20s and 30s. As the situation gets worse, only vaccines emerged as a solution, and vaccinations began in December 2020 for the first time in the UK with rapid vaccine development, and vaccinations from each country are also continuing. The COVID-19 vaccination in Korea began on February 26, 2021 and 93.7% of COVID-19 confirmed patients aged 18-49 were unvaccinated, 4.2% were primary, and 2.1% were inoculated from April to August, when the inoculation was completed. Among those who were not vaccinated, 96.3% were 18-29 years old, 91.4% 30-39 years old, and 92.4% 40-49 years old. In addition, in order to evaluate the effectiveness of preventing seriousness and death from vaccination, the severity rate of unvaccinated patients among 18-49 years old was 0.85% from May to July 2021, and while the severity rate was 0.17% among those who completed vaccination [4]. In order to receive the first dose of the 70% COVID-19 vaccine, the primary goal for the formation of COVID-19 herd immunity, the participation of 18-49 year-olds was emphasized. Meanwhile, vaccination for 18-48 years old starts on August 26, 2021 and the reservation rate on August 22, 2021 was 64%, less than the government's minimum expectation of 70%. The subjects analyzed that vaccine fear (vaccinophobia), such as breakthrough infection confirmed even after completion of vaccination, anxiety due to side effects of the vaccine rather than COVID-19 infection, and distrust due to inoculation accidents, affects the reservation rate. However, in the absence of a cure for COVID-19, prevention is the best option. Since the mutant virus is spreading rapidly in a situation where the immune capacity of most vaccines is decreasing, the time has come when an additional immune response must be strengthened. The US Centers for Disease Control and Prevention (CDC) has already decided to implement a booster shot from September 2021, just like domestic experts are also vaccinated against influenza. The necessity of annual vaccination was emphasized. Accordingly, the Korean government announced plans to inoculate additional vaccines to strengthen the preventive effect for those who have been vaccinated six months after completion of the COVID-19 vaccination while the vaccination is in progress. Priority vaccinations are given to workers, residents, and patients in nursing hospitals and nursing facilities, as well as medical personnel and health care workers for confirmed COVID-19 patients. The hospital environment can infect your patients and staff through the

respiratory tract or the blood or secretions such as the droplet by a variety of pathogens present. College nursing students are highly likely to be mutually infected by contacting patients during clinical practice as medical professionals. Therefore, nursing students need to change their health beliefs so that they know the importance of vaccination and prevent infection as medical professionals (Jeong 2015). It is necessary to identify factors that increase college nursing students' intention to get vaccinated against COVID-19 and to form a motivation to practice health beliefs and attitudes. Self-efficacy was presented along with traditional health beliefs of perceived sensitivity, seriousness, benefits and barriers, Cues to Action (health motivation) was also added to explain health-related behavior more fully, and suggested more effective behavioral intervention than was available to health educators [12]. To this end, this study intends to apply the Health Belief Model (Shin 2020; Rosenstock et al., 1988), a model that best explains individual disease prevention and behavioral motivation, such as vaccination. Until now, it is difficult to find a study on the degree and intention of COVID-19 vaccination for college nursing students. Therefore, this study aims to provide basic data to investigate the COVID-19 vaccination status of college nursing students who have not experienced clinical practice, to identify the factors affecting vaccination intention, and to prepare strategies to increase the COVID-19 vaccination rate in the future.

Research Purpose

This is a descriptive research study to find out the factors in which perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy affect vaccination intention of college nursing students who have not undergone clinical practice.

- a) The difference in the intention to be vaccinated against COVID-19 according to the general characteristics of the subject is identified.
- b) It identifies the subject's perceived sensitivity to COVID-19 vaccination, perceived severity, perceived benefit, perceived disability, behavioral opportunity, self-efficacy, and the degree of vaccination intention.
- c) It identifies the correlation between the subject's perceived sensitivity to COVID-19 vaccination, perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy, and vaccination intention, and identifies factors affecting COVID-19 vaccination intention.

Research Methods

Conceptual Framework of the Study

The conceptual framework of this study based on the health belief model and research questions is as follows [Figure 1].

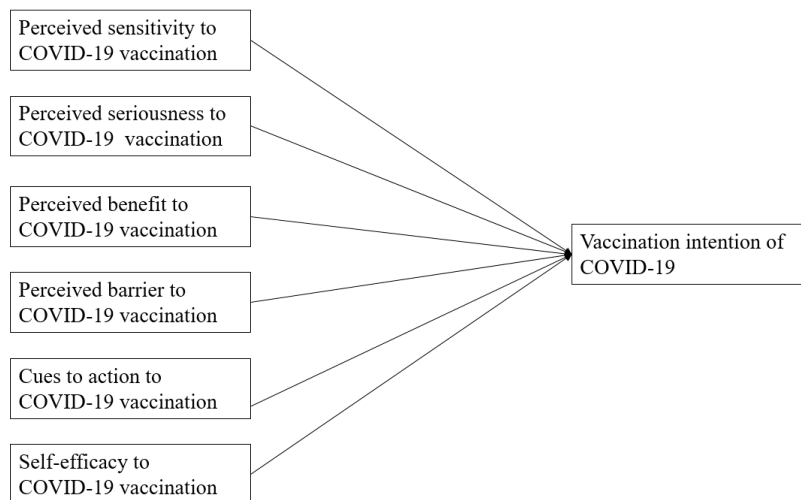


Figure 1. *Conceptual framework for intent to get vaccinated against COVID-19*

Research Design

This study investigated the perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy, and vaccination intentions against COVID-19 among 2nd year nursing students who have not undergone clinical practice. It is a descriptive research study to identify the factors that influence the intention to be vaccinated against COVID-19.

Research Subjects

This study distributed a survey online to 2nd year nursing students who have not undergone clinical practice at C University in G City from August 30 to September 4, 2021. When selecting the subjects; first-year nursing students were excluded because they were mostly learning basic liberal arts subjects, so there was no difference from general university students. In addition, the 3rd and 4th grades of nursing students were excluded because it was mandatory for them to undergo hospital clinical practice. In this study, second-year students who are learning nursing major theory and classroom practice were selected. For the study sample size, G*Power 3.1 program was used, and the required number of samples was calculated to be 128 when the effect size .2, significance level .05, power .90, and 14 predictors were set as the multiple regression analysis criteria. In this study, the appropriate number of samples was met by using the questionnaire answered by 137 out of 198 students for the final analysis.

Research Tools

General characteristics. The general characteristics consisted of a total of seven items: gender, age, vaccination presence, vaccine type, vaccination side effects, previous post-vaccination side effects, and health status.

Perceived sensitivity. In the tool developed by (Koh 2012), the flu was changed to COVID-19 and used. It is a 5-point Likert scale with a total of four questions, rate

ranging from 'strongly agree' with five points to 'not at all' with one point, with a higher score indicating a higher perceived sensitivity to COVID-19 vaccination. In the study of Ko, the Cronbach's $\alpha=.837$ while the reliability in this study was Cronbach's $\alpha=.878$ [Table 1].

Perceived seriousness. In the tool developed by (Koh 2012), the flu was changed to COVID-19 and used. It is a 5-point scale with a total of four questions, rate ranging from 'strongly agree' with five points to 'not at all' with one point, with a higher score indicating a higher perceived seriousness to COVID-19 vaccination. In Ko, the Cronbach's $\alpha=.827$ while the reliability in this study was Cronbach's $\alpha=.726$ [Table 1].

Perceived benefit. In the tool developed by (Koh 2012), the flu was changed to COVID-19 and used. It is a 5-point scale with a total of four questions, rate ranging from 'strongly agree' with five points to 'not at all' with one point, with a higher score indicating a higher perceived benefit related to COVID-19 vaccination. In the study of Ko, the Cronbach's $\alpha=.746$ while the reliability in this study was Cronbach's $\alpha=.870$ [Table 1].

Perceived barrier. One of the tools developed by (Koh 2012) was modified and used with one sentence 'I think that vaccination puts a burden on the government and health insurance finances (vaccination cost)'. It is a 5-point scale with a total of four questions, rate ranging from 'strongly agree' with five points to 'not at all' with one point, with a higher score indicating a higher perceived barrier related to COVID-19 vaccination. In Koh, the Cronbach's $\alpha=.715$ while the reliability in this study was Cronbach's $\alpha=.574$ [Table 1].

Cues to action. The tool developed by (Woo 2016) was used. It is a 5-point scale with a total of three questions, rate ranging from 'strongly agree' with five points to 'not at all' with one point, with a higher score indicating a higher cues to action related to COVID-19 vaccination. In the study of Woo, the Cronbach's $\alpha=.77$ while the reliability in this study was Cronbach's $\alpha=.612$ [Table 1].

Self-efficacy. Based on the tool developed by (Ko 2012), modified and improved by (Kim et al., 2017), flu was modified to COVID-19 for this study and used. Among them, one question was modified and used to say, "I can receive regular vaccinations (booster shots) if necessary for the prevention of infectious diseases (COVID-19)." It is a 5-point scale with a total of five questions, with rate ranging from 'strongly agree' with five points to 'not at all' with one point. The higher the score, the higher the self-efficacy related to the COVID-19 vaccination. The Cronbach's α in the study of Koh was .802 and .941 in (Kim et al., 2017), while in this study, the reliability was .941 [Table 1].

Vaccination intention. Based on the tool developed by (Ko 2011), modified and improved by (Kim et al., 2017), flu was modified to COVID-19 for this study and used. It is a 5-point scale with a total of four questions, with rate ranging from 'strongly agree' with five points to 'not at all' with one point. A higher score indicates a higher intention to vaccinate against COVID-19. The Cronbach's α in the study of Ko was .875 and .918 in Kim, Heo, Lim and Park [13], while in this study, the reliability was .890 [Table 1].

Table 1
The reliability of tools

Tool	Number of items	Cronbach's α in the original study	Cronbach's α in the current study
Perceived sensitivity	4	.837	.878
Perceived seriousness	4	.827	.726
Perceived benefit	4	.746	.870
Perceived barrier	4	.715	.574
Cues to action	3	.77	.612
Self-efficacy	5	Ko (.802) Kim, Heo, Lim and Park (.941)	.941
Vaccination intention	4	Ko (.875) Kim, Heo, Lim and Park (.918)	.890

Ethical Consideration of Research Objects

In this study, the researcher explained the purpose and content online, guaranteed anonymity, and explained the ethical aspects of the study that the survey could be stopped if unwanted, to which they agreed. They answered using the Google Online Questionnaire, and the time required for the questionnaire was about 10 minutes.

Data Analysis Method

The analysis of the collected data used the IBM SPSS 25.0 program.

- 1) The general characteristics of subjects were analyzed by frequency, percentage, mean, and standard deviation.
- 2) Perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention related to COVID-19 vaccination used mean and standard deviation.
- 3) The analysis of perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention related to the general characteristics of the subjects was analyzed by t-test, ANOVA, and Scheffe test.
- 4) Pearson correlation was used to correlate the subjects' perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention.
- 5) Factors influencing COVID-19 vaccination intention were analyzed using multiple regression.

Results

General Characteristics of Subjects

Looking at the general characteristics of the subjects, there were 27 male students (19.7%) and 110 female students (80.3%), and their average age was 23.47 years. There were 63 subjects (46.0%) who were not vaccinated against COVID-19, 62 subjects (45.3%) received the first dose, and 12 subjects (8.8%) received the second dose. Among the subjects vaccinated against COVID-19, 56 (75.7%) were vaccinated with Pfizer-BioTech vaccine the most and 23 (31.1%) responded that there was a vaccine side effect after being vaccinated against COVID-19. After the previous vaccination, 125 (91.2%) answered that there were no side effects and 104 (75.9%) answered that they were in good health [Table 2].

Table 2
General characteristics of subjects (N=137)

Characteristics	Categories	N (%)	M±SD
Gender	Male	27 (19.7)	23.47±4.63
	Female	110 (80.3)	
Age(yr)	≤25	108 (78.8)	
	26~30	22 (16.1)	
	≥31	7 (5.1)	
COVID-19 vaccination	No	63 (46.0)	
	1st Vaccination	62 (45.3)	
	2nd Vaccination	12 (8.8)	
COVID-19 vaccines type (n=74)	Pfizer-BioTech	56 (75.7)	
	Moderna	15 (20.3)	
	Others	3 (4.0)	
Side effects after vaccination (n=74)	Yes	23 (31.1)	
	No	51 (68.9)	
Side effects after the previous vaccination (ex, flu, hepatitis vaccine, etc.)	Yes	12 (8.8)	
	No	125 (91.2)	
	Healthy	104 (75.9)	
Health status	Moderate	30 (21.9)	
	Poor	3 (2.2)	

Differences in COVID-19 Vaccination intention by Subjects

There was no statistically significant difference in the intention to get vaccinated against COVID-19 according to the general characteristics of the subjects [Table 3].

Table 3
Differences in COVID-19 vaccination intention by subjects (N=137)

Characteristics	Categories	N (%)	M±SD	t/F (p)
Gender	Male	27 (19.7)	3.83±0.89	-.787 (.433)
	Female	110 (80.3)	3.96±0.72	
Age	≤25	108 (78.8)	3.97±0.74	.614 (.542)
	26~30	22 (16.1)	3.77±0.85	
	≥31	7 (5.1)	4.00±0.76	
COVID-19 vaccination	No	63 (46.0)	3.82±0.69	2.358 (.099)
	1st Vaccination	62 (45.3)	3.98±0.84	
	2 nd Vaccination	12 (8.8)	4.31±0.56	
COVID-19 vaccines type (n=74)	Pfizer-BioTech	56 (75.7)	3.96±0.84	2.537 (.086)
	Moderna	15 (20.3)	4.10±0.60	
	Others	3 (4.0)	5.00±0.00	
Side effects after vaccination (n=74)	Yes	23 (31.1)	3.97±0.91	-.475 (.636)
	No	51 (68.9)	4.06±0.76	
Side effects after the previous vaccination (ex, flu, hepatitis vaccine, etc.)	Yes	12 (8.8)	3.79±0.71	-.691 (.491)
	No	125 (91.2)	3.95±0.76	
	Healthy	104 (75.9)	3.99±0.79	
Health status	Moderate	30 (21.9)	3.78±0.63	1.303 (.275)
	Poor	3 (2.2)	3.58±0.63	

Descriptive statistics of research variables

Descriptive statistical results for variables included in this study are as follows. Subject's perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy, and vaccination intention are on a five-point scale, ranging from one to five points. Perceived sensitivity averaged 4.10±0.74 points, perceived seriousness averaged 3.92±0.69, perceived benefit averaged 3.65±0.75 points, and perceived barrier averaged 2.83±0.59 points. The average cues to action was 3.89±0.71 points, the average self-efficacy was 4.08±0.78 points, and the subject's vaccination intention was 3.94±0.76 points [Table 4].

Table 4
Descriptive statistics of research variables (N=137)

Variables	M±SD	Mini	Max	Range
Perceived sensitivity	4.10±0.74	1.75	5	1-5
Perceived seriousness	3.92±0.69	2.25	5	1-5
Perceived benefit	3.65±0.75	1.75	5	1-5

Perceived barrier	2.83±0.59	1	5	1-5
Cues to action	3.89±0.71	2	5	1-5
Self-efficacy	4.08±0.78	2	5	1-5
Vaccination intention	3.94±0.76	2	5	1-5

Degree of perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention on COVID-19

The subjects' perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention were analyzed [Table 5]. Looking at the health beliefs by area, the average score for each item of perceived sensitivity to vaccination was 'Infectious disease (COVID-19) is a disease that anyone can get ' with the highest score of 4.49±0.67, and 'I think there is a high risk of infectious diseases (COVID-19) in everyday life' with the lowest score of 3.86±0.96.' The average score for each item of perceived seriousness to vaccination was 'I think that infectious diseases (COVID-19) are highly contagious' was the highest score of 4.33±0.73, and 'I think that if you get an infectious disease (COVID-19), your interpersonal relationships will be disrupted' with the lowest score of 3.61±1.09. The average score for each item of perceived benefit to vaccination was 'Vaccination is more economical to prevent infectious diseases (COVID-19)' was the highest score of 3.88±0.81, and 'I think vaccination will help you lead an active daily life ' with the lowest score of 3.45±0.89. The average score for each item of perceived barrier to vaccination was 'I am concerned about the side effects of vaccination (fever, pain, edema, etc.)' was the highest score of 3.88±0.85, and 'I think vaccination is a time burden' with the lowest score of 2.33±0.95. The average score for each item of cues to action to vaccination was 'A close acquaintance or family member has been vaccinated ' was the highest score of 4.50±0.65, and 'I have been told by a medical professional about the importance of vaccination ' with the lowest score of 3.32±1.10. The average score for each item of self-efficacy to vaccination was 'I am confident in practicing vaccination' was the highest score of 4.23±0.83, and 'I can vaccinate even if it costs money ' with the lowest score of 3.87±0.95. The average score for each item of vaccination intention was 'I am willing to explore information about vaccination against infectious diseases (COVID-19) in the future ' was the highest score of 4.01±0.81, and 'I am willing to recommend the vaccination against infectious disease (COVID-19) to my acquaintances ' with the lowest score of 3.83±0.95.

Table 5

Degree of perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention of COVID-19(N=137)

Variables	Items	M±SD
Perceived sensitivity	1. I think there is a high risk of infectious diseases (COVID-19) in everyday life.	3.86±0.96
	2. Infectious disease (COVID-19) is a disease that anyone can get.	4.49±0.67
	3. I am worried about getting an infectious	3.93±0.93

	disease (COVID-19).	
	4. Whenever I hear about an infectious disease (COVID-19), I think that I can also get an infectious disease (COVID-19).	4.12±0.86
Perceived sensitivity average		4.10±0.74
	5. I think that daily life is difficult if you get an infectious disease (COVID-19).	4.12±0.83
Perceived seriousness	6. I think that if you get an infectious disease (COVID-19), your interpersonal relationships will be disrupted.	3.61±1.09
	7. I think that infectious diseases (COVID-19) are highly contagious.	4.33±0.73
	8. If you don't get vaccinated, it's easy to miss the timing of treatment and you think it can lead to a serious condition.	3.64±1.01
Perceived seriousness average		3.92±0.69
	9. Vaccination is effective in maintaining health.	3.78±0.89
Perceived benefit	10. I think that vaccination can sufficiently prevent infectious diseases (COVID-19).	3.50±0.96
	11. Vaccination is more economical to prevent infectious diseases (COVID-19).	3.88±0.81
	12. I think vaccination will help you lead an active daily life.	3.45±0.89
Perceived benefit average		3.65±0.75
	13. I don't think vaccination has any preventive effect.	2.53±0.89
Perceived barrier	14. I think vaccination is a time burden.	2.33±0.95
	15. I think that vaccination puts a burden on the government and health insurance finances (vaccination cost).	2.58±0.89
	16. I am concerned about the side effects of vaccination (fever, pain, edema, etc.).	3.88±0.85
Perceived barrier average		2.83±0.59
	17. I have been told by a medical professional about the importance of vaccination.	3.32±1.10
Cues to action	18. A close acquaintance or family member has been vaccinated.	4.50±0.65
	19. A close acquaintance or family member advised me to vaccinate.	3.84±1.01
Cues to action		3.89±0.71
	20. I am confident in practicing vaccination.	4.23±0.83
Self-efficacy	21. I will get vaccinated	3.87±0.95
	22. I can take the time to get vaccinated.	4.18±0.77

	23. I can receive regular vaccinations (booster shots) if necessary for the prevention of infectious diseases (COVID-19).	3.98±0.90
	24. I can get vaccinated even if I am afraid of getting an injection.	4.13±0.86
Self-efficacy average		4.08±0.78
	25. I am willing to explore information about vaccination against infectious diseases (COVID-19) in the future.	4.01±0.81
Vaccination intention	26. I am willing to consult with medical staff regarding vaccination against infectious diseases (COVID-19).	3.93±0.81
	27. I am willing to be vaccinated	3.97±0.92
	28. I am willing to recommend the vaccination against infectious disease (COVID-19) to my acquaintances.	3.83±0.95
Vaccination intention average		3.94±0.76
Average overall health beliefs		3.77±0.49

Correlations among perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention on COVID-19

The correlations among the subjects' perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention related to COVID-19 were analyzed. The COVID-19 vaccination intention showed a significantly positive correlation with perceived sensitivity ($r=.573$, $p<.001$), perceived seriousness ($r=.564$, $p<.001$), perceived benefit ($r=.747$, $p<.001$), cues to action ($r=.546$, $p<.001$), self-efficacy ($r=.856$, $p<.001$), and a significantly negative correlation with perceived barrier ($r=-.244$, $p=.004$) [Table 6].

Table 6
Correlations among perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy and vaccination intention on COVID-19 (N=137)

Variables	Perceived sensitivity $r(p)$	Perceived seriousness $r(p)$	Perceived benefit $r(p)$	Perceived barrier $r(p)$	Cues to action $r(p)$	Self-efficacy $r(p)$	Vaccination intention $r(p)$
Perceived sensitivity	1						
Perceived seriousness	.680. ($<.001$)	1					

SS						
Perceived benefit	.476 (.001)	.598 (.001)	1			
Perceived barrier	-.024 (.783)	-.058 (.500)	-.296 (.001)	1		
Cues to action	.268 (.002)	.357 (.001)	.397 (.001)	-.048 (.581)	1	
Self-efficacy	.532 (.001)	.485 (.001)	.661 (.001)	-.314 (.001)	.524 (.001)	1
Vaccination intention	.573 (.001)	.564 (.001)	.747 (.001)	-.244 (.004)	.546 (.001)	.856 (.001)

Influencing Factors of COVID-19 Vaccination intention

Factors affecting the intention of nursing students to be vaccinated against COVID-19 were identified. A stepwise multiple regression analysis was performed including the perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy related to COVID-19 vaccination that showed a significant correlation with vaccination intention. In the basic assumption for multiple regression analysis, the correlations between independent variables are independent of each other, and the Durbin-Watson statistic is 2.014, which is close to 2, satisfying the mutual independence of the residuals. Also, as a result of checking for multicollinearity, the tolerance limit (Tolerance) was 0.40 to 0.82, which was less than 1.0. The variance inflation factor (VIF) was 1.22-2.50, which did not exceed 10, so it was confirmed that there was no problem. The test results to satisfy the assumption of residuals satisfied linearity, normality, mutual independence, and equal variance. The regression model for the subject's intention to be vaccinated against COVID-19 was found to be significant ($F=92.31$, $p<.001$), and the adjusted coefficient of determination was .80. The factors affecting nursing students' intention to get vaccinated against COVID-19 were as follows. Total amount of change in the order of self-efficacy ($\beta=.55$, $p<.001$), perceived benefit ($\beta=.28$, $p<.001$), and cues to action ($\beta=.11$, $p=.019$) which was 80% was explained [Table 7].

Table 7. Influencing Factors of COVID-19 Vaccination intention (N=137)

Variables	B	S.E	β	t	p
(constant)	-1.404	1.093		-1.285	.201
Self-efficacy	.431	.047	.554	9.160	<.001
Perceived benefit	.285	.058	.284	4.957	<.001
Cues to action	.157	.066	.110	2.384	.019
$R^2=.810$, Adj. $R^2=.801$, $F=92.308$ ($p<.001$)					

Discussion

Since COVID-19 has had an unprecedented impact on the society as a whole, as future medical professionals, nursing students must have the right beliefs and attitudes compared to other majors to acquire accurate knowledge (Ko 2011; Kim 2021; Bae 2020). As a result of the study, the higher the self-efficacy, the higher the perceived benefit, and the higher the cues to action, the higher the vaccination intention of nursing students for COVID-19 vaccination. COVID-19 vaccination intention showed a significantly correlation with perceived sensitivity ($r=.573$, $p<.001$), perceived seriousness ($r=.564$, $p<.001$), perceived benefit ($r=.747$, $p<.001$), cues to action ($r=.546$, $p<.001$), self-efficacy ($r=.856$, $p<.001$), and a significantly negative correlation with perceived barrier ($r=-.244$, $p=.004$). The factors affecting nursing students' intention to get vaccinated against COVID-19 were as follows. Total amount of change in the order of self-efficacy ($\beta=.55$, $p<.001$), perceived benefit ($\beta=.28$, $p<.001$), and cues to action ($\beta=.11$, $p=.019$) which was 80% was explained. As a result of this study, it was found that self-efficacy was the most influential factor on the intention of vaccination against COVID-19. A person with a high sense of self-efficacy believes in their own choices and abilities and can obtain better positive results, which is an important factor in determining their behavior (Yoon et al., 2020; Kim 2019; Kim et al., 2020).

Comparing with other vaccination-related studies that applied the health belief model, (Shin 2020) found that vaccination intentions were affected in the order of cues to action, self-efficacy, and perceived benefit, which was the same in this study. In the study of flu vaccination intention, (Kim et al., 2017) found that perceived seriousness, perceived benefit, cues to action and self-efficacy influenced flu vaccination intention. In addition, (Ko 2011) was similar to this study as perceived vulnerability, perceived seriousness, perceived benefit, self-efficacy, and perceived barrier were related in the tuberculosis vaccination intention study and self-efficacy was the highest influencing factor. In addition, (Ko 2012) showed that self-efficacy and perceived seriousness had an influence on cervical cancer prevention behavior intention, and perceived sensitivity and perceived barrier were not significant, showing similar results to this study. As a result of comparing the COVID-19 prevention intention study applying the health belief model, (Gim et al., 2020) found that perceived seriousness, perceived vulnerability, and perceived benefit were related to preventive behavioral intention and were not related to perceived barrier. (Hong et al., 2021) also showed the same results as in this study, as it was related to perceived seriousness, perceived vulnerability, and perceived benefit, but perceived barrier has no effect. It is understood that the vaccination intention was felt more than the perceived barrier as various support was provided for prevention as the infection situation worsened and many of the disability-related parts such as side effects, time burden and financial burden were resolved.

Conclusion

This study investigated the effects of perceived sensitivity, perceived seriousness, perceived benefit, perceived barrier, cues to action, self-efficacy, and vaccination intention to COVID-19 among 2nd year nursing students who have not undergone

clinical practice. This is a descriptive research study to understand the relationship and to examine the factors that influence vaccination intention. As a result of the study, the higher the self-efficacy, the higher the perceived benefit, and the higher the cues to action, the higher the vaccination intention of nursing students for COVID-19 vaccination.

Furthermore, in order to increase the intention of college nursing students to be vaccinated against COVID-19, a strategy to emphasize self-efficacy and the benefits of vaccines through various educational programs and improve the opportunity to act is considered necessary. In particular, it is believed that continuous efforts are needed to minimize risks such as vaccine management and side effects at the government level and to put vaccination into action by emphasizing its benefits. In addition, it will be possible to minimize the risk of additional infections such as secondary, tertiary and Nth infections to nursing students as well as patients and medical staff by improving positive perceptions on COVID-19 vaccination. Based on the above research results, this study suggests the following. First, since it was limited to one region in one country and targets only the second- year college nursing students, it is necessary to compare the results with general college students or foreign college students in the future. Second, it is necessary to check the reliability of the study by adding various variables that can increase the vaccination intention for COVID-19. Third, it is suggested to develop and apply strategies that can improve self-efficacy, perceived benefits, and cues to action.

Conflict of Interest

The author declares no conflict of interest.

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