Abstract

Purpose: This study is a descriptive research study intended to confirm the effect of COVID-19 related efficacy of infection prevention activity, fear, and crisis communication skills on the importance of newly infectious disease response capability of the nursing students.

Method: The subjects were 266 3rd and 4th year students enrolled in the Department of Nursing at a university located in City I of Province J. The data collection was conducted from June 14 to June 27, 2020, and the data analysis method was the SPSS/WIN 23.0 using frequency, percentage, mean and standard deviation, Independent t-test, One-way ANOVA, Pearson’s correlation coefficient, and the multiple regression analysis was performed.

Results: As a result of this study, the importance of newly infectious disease response capability turned out to have a statistically significant positive correlation with the efficacy of infection prevention activity, fear, and crisis communication skills. The importance of newly infectious disease response capability included the efficacy of infection prevention activity(β=.365, p<.001), crisis communication skills(β=.212, p<.001), and fear(β=.130, p<.001).045), while the explanatory power was 30.0%.

Conclusion: This study confirmed that the nursing students' COVID-19 related efficacy of infection prevention activity, fear, and crisis communication skills were the factors influencing the importance of newly infectious disease response capability related to COVID-19. Among which, it is necessary to develop an infection prevention activity support program to strengthen the efficacy of infection prevention activity yielding the largest impact.

Keywords: COVID-19, Efficacy of Infection Prevention Activity, Fear, Crisis Communication Ability, Importance of New Infectious Disease Response Capability

1. Introduction

Since the first confirmed case of COVID-19 in Korea on January 19, 2020[1], the cumulative number of confirmed cases has been 21,236,355 as of August 13, 2022 [2], and to prevent the spread of COVID-19 infection, many human and material resources have been invested, such as by setting up screening clinics, putting in a lot of medical personnel, and securing negative pressure beds, and medical personnel who have many opportunities to come in contact with confirmed COVID-19 patients in the medical field are at risk of infection[3]. Furthermore, the nursing students who practice at hospitals for the educational process and have frequent contact with patients have a higher risk of exposure to infection than the general public, and hence, more caution is needed[4].
As such, active participation in the infection prevention activities by the nursing students who are at high risk of exposure to infection is also related to self-efficacy, while self-efficacy refers to an individual's belief in their ability to solve problems in a given situation\cite{5}. They will be confident in their ability to perceive themselves as effective and will put forth sufficient effort to achieve optimal results, which leads to successful performance\cite{6}, and it is known that self-efficacy increases when self-efficacy is high\cite{5}.

Furthermore, it may be said that it is very important to actively participate in the infection prevention activities because nursing students must comply with preventive measures to prevent the spread of COVID-19 in the field by employing medical institutions and community institutions in the future\cite{7}.

Due to the spread of COVID-19, not only social chaos and economic recession, yet also changes in daily life have become inevitable\cite{8}. Since the outbreak of COVID-19, they responded that their lives had changed and their quality of life was worse than before\cite{9}. As a result of examining the change in people's quality of life after COVID-19, 82.8% of respondents responded that their daily life was changed due to COVID-19, and their quality of life was worse than before\cite{9}. In particular, anxiety and fear about COVID-19 infection turned out to be high. Regarding the possibility of infection, the highest response was 'half-and-half' at 55.8%, and the number of subjects who responded 'high' the possibility of infection turned out to be 20.1%\cite{10}. Such results appear to be influenced by the fear of criticism from people around them when they are confirmed with COVID-19, and can also be confirmed through the results of a study in which people responded that the responsibility for the infection rests with the individual and that the infection is the person's fault\cite{11}. The problem is that this phenomenon can create a social stigma due to the fault of the individual who is responsible for the infection\cite{8}.

The fear of COVID-19 is the most common emotion experienced when an infectious disease occurs and is a factor that influences other psychological reactions, emotions, considers, and behaviors\cite{12}. The fear of infection is an emotional form that appears irrespective of age and race, and is a recognition of a specific risk\cite{13}, and as fear increases, it interferes with rational thinking and makes it impossible to take corrective actions\cite{12}. As such, the changes in life due to COVID-19 and anxiety and fear of infection can negatively affect an individual's quality of life and mental health\cite{14}.

Crisis communication refers to a communication process in which information is exchanged between individuals, organizations, and organizations to understand a specific event, predict risk outcomes, and mitigate damage\cite{15}, while comfort\cite{16} was pointed out that the organic communication of the disaster management actors was weak as the cause of the difficulties. In the 2000s, Korea experienced the epidemics of infectious diseases such as Severe Acute Respiratory Syndrome (SARS) and the Middle East Respiratory Syndrome (MERS), while the contents of 'Infectious Disease Control and Prevention Act' has been continuously supplemented\cite{17}. In particular, during the outbreak of MERS in 2015, public distrust and confusion were amplified as related information was not disclosed transparently. Thereafter, through efforts such as the establishment of a crisis communication officer's office at the Korea Centers for Disease Control and Prevention (currently the Korea Disease Control and Prevention Agency) in 2016, and the publication of "Public Health Crisis Communication Guidelines" and the "Standard Operating Procedures for Public Health Crisis Communication" in 2017\cite{18}, the government, the media, and social media and various mass media have consistently provided the information on disease and epidemiologic information, including patient movement, and encouraged compliance with control measures\cite{19}. Such activities have an impact on raising the public's confidence in coping with diseases\cite{20}.

Furthermore, sharing information through communication in such a crisis situation is considered to be an important factor for preparing for and solving newly infectious diseases in the
future, and it will be an important part for nurses who work in the medical field and have to face newly infectious diseases.

The infectious diseases are difficult to deal with, and even with solid prevention and preparation, if an initial response fails, the speed and scope of transmission of infectious diseases far exceed our expectations. Disaster response related to these infectious diseases is not carried out as initially planned, and efforts must be made to recognize the response system because various uncertainties and complexities that arise after the outbreak must be anticipated and dealt with[21]. Hence, the government's disaster response and management capabilities are very important in order to promptly respond to new disasters that are not similar to the existing disasters.

In general, disaster response capacity is defined as all activities for disaster prevention, preparation, response, and recovery[22][23]. Petak[24] classifies the disaster management process based on the time of occurrence or management of a disaster and presents four stages of Prevention, Preparedness, Response, and Recovery, which are considered as essential requirements for disaster response for major actors in the country to have disaster management capabilities[17].

However, currently in Korea, the studies related to novel infectious diseases including COVID-19 primarily focus on the factors influencing preventive behavior[7], anxiety or knowledge about infectious diseases, and performing preventive actions[25]. The studies on health communication and crisis management[Son AR et al, 2020], and the effects of infectious disease government capacity and citizenship on the response performance of infectious diseases[17] are also conducted, yet these contents are comprehensively reviewed for nursing students. Studies that can be considered are scarce.

Accordingly, how do the nursing students who will work as nurses in medical fields in the future evaluate the efficacy of infectious disease prevention activities and the fear of infectious diseases that they feel while experiencing clinical field practice, and how the nursing students evaluate their ability to communicate with infectious diseases related to infectious diseases, and as such, it is considered necessary to learn about and examine how these various factors affect the importance of infectious disease response competency, and based on such study, it is intended to provide the useful basic data for developing effective strategies to enhance the nursing students' ability to respond to emerging infectious diseases and improve their professional competency as the future nurses.

2. Purpose of Research

The purpose of this study is to determine the importance of newly infectious disease response capability by examining the extent of COVID-19 related efficacy of infection prevention activity, fear, crisis communication skills, and importance of newly infectious disease response capability of the nursing students, and analyzing the relationship between them, while the influencing factors are to be investigated. The specific purposes are as follows.

1) Examine the COVID-19 related efficacy of infection prevention activity, fear, crisis communication skills, and importance of newly infectious disease response capability of the nursing students.

2) Examine the importance of COVID-19 related efficacy of infection prevention activity, fear, crisis communication skills, and newly infectious disease response capacity according to the general characteristics of the nursing students.
3) Examine the correlation between the COVID-19 related efficacy of infection prevention activity, fear, and importance of newly infectious disease response capability of the nursing students.

4) Examine the factors influencing the efficacy of infection prevention activity, fear, and importance of newly infectious disease response capability of the nursing students.

3. Research Method

3.1. Research design

This study is a descriptive research study conducted to examine and understand the efficacy of infection prevention activity, fear, and importance of newly infectious disease response capability of the nursing students by analyzing the correlation between them, and the effect of efficacy of infection prevention activity and fear on the importance of newly infectious disease response capability.

3.2. Subjects of the study

The subjects of this study were 3rd and 4th year students enrolled at a university located in City I of Province J, and they were conveniently sampled for those who had experienced clinical practice at a tertiary medical institution. An online survey was conducted through URL to subjects who understood the purpose of this study and gave permission to voluntarily respond to the survey.

To obtain the number of subjects for this study, the G-power 3.1 program was used, and when a significance level of .05, a medium effect size of .15, and a power of .95 were applied, the sample size was calculated to be 178. A dropout rate of about 20% was considered and questionnaires were distributed for 270 students who desired to participate in the study additionally.

3.3. Research tools

3.3.1. Covid-19 efficacy of infection prevention activity

In this study, to measure the efficacy of infection prevention activity of COVID-19, the researchers developed it by referring to the contents of the COVID-19 prevention action presented by the Korea Disease Control and Prevention Agency[3]. Based on the five basic questions, content validity was verified from one infection control specialist and two nursing professors(Content Validity Index, CVI=.87). The CVI for each question is 1-.67, which was developed by collecting opinions of experts and modifying and supplementing them. Construction validity was verified using factor analysis using the main factor analysis and the Varimax rotation method. As a result of the verification, factor analysis was possible with KMO=0.754 and X2=385.60(p<.001), and there were no questions with a commonality of less than .50. Furthermore, as a result of main factor analysis and Varimax rotation method, it was classified as one factor, and the eigenvalue was 1.0 or more, the factor loading was 0.4 or more, and the total variance was 77.04%, thereby confirming the construct validity of this research tool.

The questions used a Likert scale ranging from 1 point of ‘not at all’ to 5 points of ‘strongly agree’, and the higher the score, the higher the efficacy of infection prevention activity for COVID-19. The reliability(Cronbach's α) calculated in this study was .831.

3.3.2. Fear for each covid-19 situation

In this study, the researchers developed based on previous studies[8] to measure the situational fear of COVID-19. Based on the 8 basic questions, content validity was verified from one infection control specialist and two nursing professors(Content Validity Index, CVI=.87). The CVI for each question is 1-.67, which was developed by collecting opinions of experts and modifying
and supplementing them. The construct validity was verified using the factor analysis using the main factor analysis and the Varimax rotation method. As a result of the verification, the factor analysis was made possible with $KMO=0.854$ and $X^2=533.272(p<.001)$, and the two questions with a commonality of less than .50 (fear of being criticized for canceling a schedule and the fear of additional confirmed cases) were deleted. As a result of performing the main factor analysis and Varimax rotation method through a total of 6 questions, it was classified as one factor. The eigenvalue was 1.0 or more, the factor loading was 0.40 or more, and the total variance was 73.93%, which verified the validity of this study tool.

The questions used a Likert scale ranging from 1 point of ‘not at all’ to 5 points of ‘strongly agree’, and the higher the score meant the larger the fear of COVID-19. The reliability (Cronbach’s $\alpha$) calculated in this study was .867.

### 3.3.3. Crisis communication of the health authorities

In this study, to measure the efficacy of infection prevention activity of COVID-19, the researchers developed it by referring to the contents of the COVID-19 prevention action presented by the Korea Disease Control and Prevention Agency[3]. Based on the five basic questions, content validity was verified from one infection control specialist and two nursing professors (Content Validity Index, CVI=.87). The CVI for each question is 1-.67, which was developed by collecting opinions of experts and modifying and supplementing them. The construct validity was verified using the factor analysis using the main factor analysis and the Varimax rotation method. As a result of the verification, the factor analysis was made possible with $KMO=0.818$ and $X^2=929.603(p<.001)$, and there were no questions with a commonality of less than .50. Furthermore, as a result of main factor analysis and Varimax rotation method, three factors were classified, and the eigenvalue of 1.0 or more, factor loading was 0.40 or more, and the total variance was 72.33%, which verified the construct validity of this research tool.

The questions used a Likert scale ranging from 1 point of ‘not at all’ to 5 points of ‘strongly agree’, and the higher the score, the higher the crisis communication of the health authorities about COVID-19. The reliability (Cronbach’s $\alpha$) calculated in this study was .852.

### 3.3.4. Importance of new infectious disease response capability

In this study, to measure the importance of newly infectious disease response capability, it was developed by this researcher based on previous studies[26]. Based on 10 basic questions, content validity was verified from one infection control specialist and two nursing professors (Content Validity Index, CVI=.87). The CVI for each question is 1-.67, which was developed by collecting opinions of experts and modifying and supplementing them. Construction validity was verified using the factor analysis by performing the main factor analysis and the Varimax rotation method. As a result of the verification, the factor analysis was made possible with $KMO=0.878$ and $X^2=846.566(p<.001)$, and two questions with a commonality of less than .50 (strengthening the sense of community and strengthening the convergence of public opinion) were deleted. As a result of main factor analysis and Varimax rotation method through a total of 8 questions, which were classified into two factors. The eigenvalue was larger than 1.0, the factor loading was larger than 0.40, and the total variance was 67.49%, which verified the validity of this research tool.

The questions used a Likert scale ranging from 1 point of 'not at all important' to 5 points of 'very important', and the higher the score, the higher the importance of newly infectious disease response capability. The reliability (Cronbach’s $\alpha$) calculated in this study was .880.

### 4. Method of Data Collection

The data collection of this study was conducted from June 14 to June 27, 2020, and an online
questionnaire was distributed through the department representative. Before starting the online questionnaire, the purpose and duration of the study were explained, and the participants were informed that they can participate in line with their voluntary will and that they can discontinue working on the questionnaire at any time. Furthermore, it was explained that the contents of responses to the questionnaire are treated anonymously and are not used for any other purpose than the research purpose. A link to the online questionnaire was distributed to a total of 270 people, of which 268 responded to the questionnaire, yet the responses of 266 people - excluding 2 who responded insincerely - were used as final analytical data.

5. Method of Data Analysis

The collected data were analyzed using the SPSS 23.0 as follows.

1) The general characteristics of the subjects were calculated as real numbers and percentages.

2) Efficacy of infection prevention activity, fear, crisis communication skills, and importance of newly infectious disease response capability according to general characteristics were analyzed using independent t-test and one-way ANOVA, and post-mortem verification was conducted using Scheffé test for analysis.

3) The relationship between the efficacy of infection prevention activity, fear, crisis communication skills, and the importance of newly infectious disease response capacity was analyzed using the Pearson’s correlation coefficient.

4) The multiple regression analysis was used to determine the effect of the subject’s efficacy of infection prevention activity, fear, and crisis communication skills on the importance of newly infectious disease response capability.

6. Results

6.1. General characteristics of the study subjects

The general characteristics of the subjects were 236 women(88.7%) by gender, and 128(48.1%) of the subjects aged 20-24. There were 148(55.6%) grades without clinical practice experience, and 118(44.4%) subjects with clinical practice experience. Regarding their usual health status, 161 people(60.5%) responded 'healthy'. Meanwhile, 164 people(61.7%) had experiences in education related to COVID-19, 135 people(50.8%) were vaccinated against influenza in 2019, and 208 people(78.2%) were willing to be vaccinated in the future.

153 people(57.5%) and 138 people(51.9%) responded that they obtain the information on COVID-19 primarily from the mass media(newspapers and TV) and the Internet(SNS, etc.), each respectively <Table 1>.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>30(11.3)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>236(88.7)</td>
</tr>
<tr>
<td>Age(years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;19</td>
<td></td>
<td>70(26.3)</td>
</tr>
<tr>
<td>20-24</td>
<td></td>
<td>128(48.1)</td>
</tr>
<tr>
<td>25-30</td>
<td></td>
<td>34(12.8)</td>
</tr>
<tr>
<td>&gt;31</td>
<td></td>
<td>34(12.8)</td>
</tr>
<tr>
<td>Clinical practice experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-clinic</td>
<td></td>
<td>148(55.6)</td>
</tr>
<tr>
<td>Clinic</td>
<td></td>
<td>118(44.4)</td>
</tr>
</tbody>
</table>
6.2. Efficacy of infection prevention activity, fear, crisis communication ability, importance of new infectious disease response capabilities according to the general characteristics of the subjects

There were statistically significant differences in terms of the efficacy of infection prevention activity according to the general characteristics of the subjects by gender(t=-2.22, p=.036) and whether they had experiences in education related to COVID-19(t=2.25, p=.025), while fear turned out to have significant differences in terms of gender(t=-2.37, p=.024), age group(t=6.68, p=.048), clinical practice experience(t=-2.07, p=.039), education experience related to COVID-19(t=2.05, p=.041), presence or absence of influenza vaccination(t=2.43, p=.016), and the intention to vaccinate in the future for influenza(t=3.30, p=.001).

Furthermore, crisis communication skills had significant differences in terms of clinical practice experience(t=-2.13, p=.034), health status(F=4.58, p=.004), and education experience related to COVID-19(t=2.29, p=.023), and the presence or absence of influenza vaccination(t = 3.15, p = .002), and the importance of newly infectious disease response capabilities had significant differences in terms of the presence or absence of education experience related to COVID-19(t = 2.28, p = .024), and the intention to vaccinate for influenza in the future(t=3.04, p=.003) <Table 2>.

Table 2. Efficacy of infection prevention activity, fear, crisis communication skills, and the importance of newly infectious disease response capability according to general characteristics.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>Efficacy of infection prevention activity</th>
<th>Fear</th>
<th>Crisis communication skills</th>
<th>Importance of newly infectious disease response capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>4.65±0.43</td>
<td>4.22±0.55</td>
<td>3.97±0.48</td>
<td>4.06±0.41</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>4.37±0.70</td>
<td>3.87±0.78</td>
<td>3.87±0.71</td>
<td>4.56±0.55</td>
</tr>
<tr>
<td>Age(years)</td>
<td>&lt;19</td>
<td>4.62±0.49</td>
<td>4.13±0.59</td>
<td>3.91±0.51</td>
<td>4.59±0.41</td>
</tr>
<tr>
<td></td>
<td>20-24</td>
<td>4.68±0.40</td>
<td>4.33±0.54</td>
<td>3.97±0.56</td>
<td>4.65±0.44</td>
</tr>
<tr>
<td></td>
<td>25-30</td>
<td>4.66±0.41</td>
<td>4.37±0.51</td>
<td>4.04±0.48</td>
<td>4.63±0.42</td>
</tr>
</tbody>
</table>
6.3. Relationship among the efficacy of infection prevention activity, fear, crisis communication ability, and the importance of new infectious disease response capability

The importance of newly infectious disease response capability of the subjects turned out to have a significant correlation with the efficacy of infection prevention activity (r = .500, p < .001), fear (r = .368, p < .001), and crisis communication skills (r = .388, p < .001), which all had a statistically significant difference <Table 3>.

Table 3. Correlation among efficacy of infection prevention activity, fear, crisis communication ability, and the importance of new infectious disease response capability.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Efficacy of infection prevention activity</th>
<th>Fear</th>
<th>Crisis communication skills</th>
<th>Importance of newly infectious disease response capability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r(p)</td>
<td>r(p)</td>
<td>r(p)</td>
<td>r(p)</td>
</tr>
<tr>
<td>Efficacy of infection prevention activity</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear</td>
<td>.488 (&lt;.001)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crisis communication skills</td>
<td>.371 (&lt;.001)</td>
<td>.351 (&lt;.001)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Importance of newly infectious disease response capability</td>
<td>.500 (&lt;.001)</td>
<td>.368 (&lt;.001)</td>
<td>.388 (&lt;.001)</td>
<td>1</td>
</tr>
</tbody>
</table>

6.4. Effect of the efficacy of infection prevention activity, fear, crisis communication ability, importance of new infectious disease response capabilities
The multiple regression analysis was used to determine the influencing factors on the importance of newly infectious disease response capability of the nursing students. Before performing the multiple regression analysis, the correlation coefficient values with efficacy of infection prevention activity, fear, and crisis communication skills, which are independent variables of importance of newly infectious disease response capabilities, ranged from .368 to .500 (p < .001) to .80, and in the case of tolerance, it was confirmed to be .716 to .825, which was 0.1 or more. Furthermore, the variance inflation factor (VIF) ranged from 1.213 to 1.396, which turned out to be less than the reference value of 10, indicating that there was no multicollinearity of all independent variables. Examining the Durbin-Watson’s statistics, which tests the autocorrelation of errors, it is 1.828, thereby confirming that there is no autocorrelation. Next, as a result of analyzing using the Cook’s distance statistics for the influence analysis, there were no subjects with a score of 1.0 or higher. As a result of the residual analysis, the linearity of the model, normality of the error term, and homoscedasticity were confirmed, and hence, the regression model turned out to be significant (F=38.78, p<.001).

As a result of the multiple regression analysis performed, efficacy of infection prevention activity (β=.365, p<.001), fear (β=.130, p<.001), and crisis communication skills (β=.212, p<.001) were the factors significantly influencing the importance of newly infectious disease response capability, with a total explanatory power of 30.0%. The factor most influencing the importance of newly infectious disease response capability was the efficacy of infection prevention activity <Table 4>.

Table 4. Influence factors on the importance of newly infectious disease response capabilities(N=266).

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t(p)</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.050</td>
<td>.237</td>
<td></td>
<td>8.64(&lt;.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacy of infection</td>
<td>0.325</td>
<td>.054</td>
<td>.365</td>
<td>6.01(&lt;.001)</td>
<td>.716</td>
<td>1.396</td>
</tr>
<tr>
<td>prevention activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear</td>
<td>0.083</td>
<td>.043</td>
<td>.130</td>
<td>1.92(.045)</td>
<td>.728</td>
<td>1.373</td>
</tr>
<tr>
<td>Crisis communication skills</td>
<td>0.177</td>
<td>.047</td>
<td>.212</td>
<td>3.75(&lt;.001)</td>
<td>.825</td>
<td>1.213</td>
</tr>
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<td></td>
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</tr>
<tr>
<td>Durbin-Wason’s d=1.828, Adj R² = .300(R²=.308), F=38.78(p&lt;.001)</td>
<td></td>
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</tbody>
</table>

Note: N=266.

7. Discussion

This study examined the COVID-19 related efficacy of infection prevention activity, fear, and the importance of newly infectious disease response capability of the nursing students, confirmed the correlation between them, and examined the influencing factors on the importance of newly infectious disease response capability, and it is intended to be used as the basic data for the systematic operation of COVID-19-related infection prevention activities and educational programs for the nursing students preparing for their future as medical professionals.

In this study, 161 nursing students (60.5%) responded that the subjective evaluation of their usual health status was ‘healthy’. 164 people (61.7%) had experience in education related to COVID-19, 135 people (50.8%) who were vaccinated against influenza in 2019, and 208 people (78.2%) who were willing to vaccinate in the future. It may be considered that the nursing students’ awareness of infectious diseases and their understanding of health care for COVID-19 is high due to the nationwide spread and rapid prevalence of COVID-19 infection after 2020, which is believed to be the case with the study of Jeong Y & Park J & Kim H [27]. This suggests
that it is necessary to provide information through infection control education so that the nursing students who are preparing for their future as medical professionals can manage their own health through an accurate understanding of infectious diseases such as COVID-19.

153 people (57.5%) and 138 people (51.9%) responded that they were primarily getting information on COVID-19 from the mass media (newspapers and TV) and the Internet (Social Networking Service; SNS), respectively. It is believed that it is necessary to provide information related to COVID-19 using social media that the students can easily access as well as publicity activities through active broadcasting at the government level about COVID-19.

In the case of the difference in terms of the COVID-19 related efficacy of infection prevention activity according to the general characteristics of the subjects, it turned out that there was a significant difference in the education experience related to COVID-19. This is a similar result to a study [28][29] that demonstrated that self-efficacy was improved after infection control education was implemented using simulation for nurses. It is considered that it is possible to increase the COVID-19 related efficacy of infection prevention activity by providing education on the continuous infection control through the development of a systematic education program.

According to the general characteristics of the subjects, the communication skills for COVID-19 was higher when they had clinical practice experience, COVID-19 related education, influenza vaccination, and plan to vaccinate for influenza in the future. Such results demonstrate that given the COVID-19 situation, the nursing students who are conducting face-to-face or contactless practice in the case of clinical practice have no choice but to respond promptly to information related to COVID-19 from the government and health authorities, and respond sensitively to such information, and hence, it is considered that the government and health authorities regarding disaster and crisis situations determine that they are communicating with the public properly. Furthermore, it is considered that the nursing students who come into contact with subjects with weak immunity are generally well practiced with influenza vaccination, and are responding to and increasing sensitivity to government guidelines for such health management activities. Hence, in the case of the nursing students, clinical practice is conducted in a group of subjects vulnerable to infection, and hence, it is necessary to educate on the prevention of COVID-19-related infectious diseases so that immediate responses to COVID-19-related situations may be achieved through organic communication between hospitals, schools, and students.

As a result of confirming the correlation between the importance of newly infectious disease response capability related to COVID-19 in this study, efficacy of infection prevention activity, fear, and crisis communication skills demonstrated a positive correlation with the importance of infectious disease response capability. Since the studies on the importance of newly infectious disease response capability related to COVID-19 are still inadequate, the previous studies related to preventive behavior were referred to. The results of this study were similar to those of previous studies related to COVID-19 [7][25][27][29][30], and the previous studies related to the Middle East Respiratory Syndrome and H1N1 influenza [31][32]. As in the study [33] which claimed that the higher the self-efficacy, the higher the health behavior performance and the higher the possibility of triggering a behavior change according to the individual will, in the study of Kim Y & Song Y, self-efficacy appears to be a complete mediator in the relationship between the organizational culture of infection control and the performance of standardistic guidelines, and the efficacy of infection prevention activity in this study is also considered to be related to the importance of newly infectious disease response capability. Furthermore, the results of the study [33] which claimed that fear had a significant positive correlation with the perception or anxiety of the risk of infection related to COVID-19 [33] and the study that demonstrated the largest influence on preventive actions related to COVID-19 in the case of crisis communication skills [27] were similar. This is a situation where the prolonged COVID-19, the explosive increase in confirmed cases, and the spread of re-infection are repeated several times,
and is also an unstable social atmosphere and a state of significant confusion, and in this situation, they trust the fast and accurate response system proposed by the government and standardize it, and hence, it is considered that it is the case because such atmosphere is created. For this reason, the nursing students, who must undergo clinical practice during the curriculum, are actively practicing awareness and activities to prevent infection, demonstrating a correlation with the importance of the nursing students’ ability to respond to newly infectious diseases. New infectious diseases, which range from the Severe Acute Respiratory Syndrome (SARS), avian influenza, Middle East Respiratory Syndrome (MERS), and COVID-19, a respiratory syndrome caused by SARS-CoV-2 infection, face the risk of exposure to the virus on the rise, and the importance of the ability to respond to newly infectious diseases is increasing more than ever before. When comparing the results of this study with the results of previous studies, it was difficult to make an accurate comparison due to the different diseases and the lack of studies on the importance of newly infectious disease response capability related to COVID-19. Hence, as in this study, a continuous follow-up study is recommended on the efficacy of infection prevention activity, anxiety, and crisis communication skills, which has been suggested to be correlated with the importance of COVID-19-related infectious disease response capability.

As a result of the regression analysis performed to confirm the impact on the importance of COVID-19-related infectious disease response capacity, efficacy of infection prevention activity, anxiety, and crisis communication skills turned out to have a significant influence on the importance of COVID-19-related infectious disease response capacity, and among which, the largest impact was caused by the efficacy of infection prevention activity, while the total explanatory power was 30.0%. As in the study which demonstrated that medical students were able to prevent the MERS infection by stopping practice at medical institutions at the time of the outbreak of the MERS and performing infection prevention activities through wearing a mask, washing hands, strengthening personal hygiene, and checking daily body temperature, it will be necessary to develop an active education program to strengthen the implementation of standardistic guidelines[34]. Furthermore, it is considered that efforts should be made to improve the importance of newly infectious disease response capability experienced by the nursing students during clinical practice by providing guidelines for the infection prevention activities based on the patient safety management activities prior to the start of their clinical practice.

By applying a systematic and efficient education program for newly infectious diseases to nursing students who will become medical professionals, it is recommended that an education system is needed to strengthen the importance of responding to newly infectious diseases and to utilize them directly or indirectly for the clinical field.

8. Conclusion and Recommendations

8.1. Conclusion & recommendations of the study

In this study, the COVID-19 related efficacy of infection prevention activity, fear, and crisis communication skills of the nursing students were examined as the factors influencing the importance of newly infectious disease response capability, and the total explanatory power was 30.0%. In particular, much effort should be made to enhance the efficacy of infection prevention activity related to COVID-19, which has the largest impact on the importance of newly infectious disease response capability, and accordingly, interventions regarding the development and application of educational programs for the nursing students. This study is meaningful in that it examined the factors influencing the importance of newly infectious disease response capability. However, there are limitations in generalization to the research conducted for the nursing students at a university located in City I. Based on the results of this study, it is recommended that repeated studies are needed based on diverse variables such as COVID-19 related efficacy of
the infection prevention activity, fear, and crisis communication skills to strengthen the nursing students’ ability to respond to newly infectious diseases.

9. References

9.1. Journal articles


[26] Lohiniva AL & Sane J & Sibenberg K & Puumalainen T & Salminen M. Understanding Coronavirus...


9.2. Thesis degree


9.3. Additional references


## 10. Appendix

### 10.1. Author’s contribution

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<tr>
<th>Initial name</th>
<th>Contribution</th>
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<tbody>
<tr>
<td><strong>Lead Author</strong></td>
<td>Set of concepts ✔&lt;br&gt;Design ✔&lt;br&gt;Getting results ✔&lt;br&gt;Analysis ✔&lt;br&gt;Make a significant contribution to collection ✔&lt;br&gt;Final approval of the paper ✔&lt;br&gt;Corresponding ✔&lt;br&gt;Play a decisive role in modification ✔&lt;br&gt;Significant contributions to concepts, designs, practices, analysis and interpretation of data ✔&lt;br&gt;Participants in Drafting and Revising Papers ✔&lt;br&gt;Someone who can explain all aspects of the paper ✔</td>
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