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Purpose: The study aimed to identify the factors related to preventive behaviors for COVID-19 among students with healthcare-related majors in South Korea. Methods: The study was designed as a cross-sectional, descriptive study. Convenience sampling was conducted, involving students enrolled in two universities in South Korea in July 2020. In total, 229 students (women: 80.3%, average age: 20.08 ± 1.81 years) were instructed to complete an online survey, measuring risk perception, efficacy of preventive behaviors, awareness of governmental response, and practice level of preventive behaviors. Results: The average score for practice of preventive behaviors for COVID-19 was 4.24 ± 0.57. Factors related to preventive behaviors for COVID-19 were the information acquisition route, efficacy of preventive behaviors, and awareness of governmental responses to COVID-19. Conclusion: Psychosocial factors such as efficacy of preventive behaviors and awareness of governmental responses should be considered when developing strategies to encourage students with healthcare-related majors to practice preventive behaviors for infectious diseases.

Key Words: COVID-19; Government; Health behavior; Health belief model; Students

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INTRODUCTION

1. Background

Since the first confirmed case of coronavirus disease (COVID-19) was reported in 2019, the World Health Organization declared a Public Health Emergency of International Concern and announced in 2023 that the declaration remains in place until April 2023, accepting the recommendation of the Emergency Committee [1]. Such an announcement reflects the status of the world where while people have become more immune to COVID-19, the virus is still high in mortality compared to other respiratory infectious diseases, the emergence of new mutations remains uncertain, and the vaccination rate in low-income countries and high-risk groups is not yet sufficient [1]. The persisting public health crisis burdens both the social system as well as the medical sector, including the methods used to control infectious diseases. As such a public health crisis reduces people’s engagement in physical activities and interrupts healthy lifestyles, it may cause larger, more widespread social issues [2]. Therefore, it is necessary to build and maintain an optimal management system by considering various aspects of COVID-19, such as the characteristics of its spread, in order to coexist with the virus. Considering that high-risk groups, such as seniors and patients with underlying health conditions, are reported to have a high risk of developing complications due to COVID-19 [3], it is important to alleviate the social burden and maintain response measures to prevent infection and spread of the virus.

COVID-19 spreads through droplet transmission, where droplets sprayed while conversing or coughing spread the virus, or through physical contact with contaminated objects in multi-use facilities [4]. Considering such routes of transmission, it is critical to actively practice preventive behaviors at a personal level to prevent the spread of COVID-19 within communities [5]. However, an individual’s practice of health behaviors is influenced by psychosocial factors, which include their perception, emotions and social influences such as family, and workplace [6]. A previous study has identified that a diversity of psychosocial factors, including cognitive and social factors, affect an individual’s preventive behaviors for COVID-19 [7]. Psychosocial factors that can affect preventive behaviors include risk perception and efficacy. Risk perception refers to an individual’s subjective evaluation of the likelihood of experiencing negative incidents such as injury and diseases. It can be identified through the perception towards the severity of infectious diseases or individual vulnerability to infection [8]. The Health Belief Model (HBM) states that risk perception is an important factor that decides an individual’s practice of health behaviors and that a higher risk perception of a certain disease leads to higher compliance with health behaviors [9]. It has been reported that this is a key influential factor for not only behaviors related to the management of chronic diseases but also behaviors to prevent the spread of infectious diseases (e.g., vaccination and wearing a mask) such as Middle East respiratory syndrome (MERS), severe acute respiratory syndrome (SARS), and novel swine-origin influenza A (H1N1) [8,9].

Efficacy of preventive behaviors is defined as an individual perceiving that certain behaviors to prevent COVID-19 are beneficial to them. A cross-sectional study conducted on ordinary citizens reported that efficacy of preventive behaviors during the COVID-19 pandemic affected their practice of preventive behaviors [8]. Preceding studies also emphasize that trust in the effects of preventive behaviors is a core factor that affects the practice of preventive behaviors in health crises, such as the spread of an infectious disease [9].

Health behaviors are affected by the environment surrounding an individual and personal factors, such as their relationship with their neighbors and society [1]. Therefore, it is necessary to consider both personal and socioenvironmental factors in regards to an individual’s health behavior practice [10]. The Korean government has been promoting prevention rules and precautions for COVID-19 through various channels, while consistently sharing the status of public health and safety [11]. Considering the findings of previous research that the government’s crisis management strategies have posed a significant impact on the spread of COVID-19 [5] it seems that active governmental response to COVID-19 and relevant individual awareness are in a significant association with preventive behaviors. Therefore, this study adopted awareness of governmental response as a socioenvironmental variable as the Korean government has been making national efforts to control the spread of COVID-19 through measures.

Unlike other educational institutions, a university is where members from various regions gather based on their majors and preferences. Here, the public health crisis has isolated students from school and peer groups, greatly impacting them in both educational and sociological manners [12]. For students majoring in health care, in particular, as the curriculum includes clinical training or practice that requires face-to-face learning, COVID-19 has brought about major changes to the operation of these courses. They were also the group with the highest like-
likelyhood of being in contact with infected patients [13]. In fact, college students majoring in health care have been found to have increased levels of anxiety during the pandemic as a result of taking these courses [15]. College students majoring health care not only learn basic infection prevention measures through their curriculum but will also play a pivotal role as health specialists in public health in medical institutions and communities after graduating from school, they are members of a special group that is more interested in public health [14]. In addition, the psychosocial factors affecting health behaviors identified in this study may have differential effects depending on the characteristics of the group, and therefore need to be examined on a group-by-group basis [16]. Therefore, this study aims to carry out an in-depth examination of the preventive behaviors of college students majoring in health care in South Korea. The findings of the study can be used as the basic data for the development of preventive behavior programs for new infectious respiratory diseases, including COVID-19, for college students in the field. It will also provide basic data for safety management strategies for students at universities and institutions that have a responsibility to ensure the safety of them during a pandemic.

**METHODS**

1. **Design**

This study is a cross-sectional, descriptive study to identify the factors related to health care related major students’ preventive behaviors for COVID-19.

2. **Subjects**

The target population of this study was college students with health care related majors at universities in South Korea, and the subjects were students majoring health care from two universities in one region. The subjects were selected under the following criteria: (1) must be enrolled in a health care related major (nursing, dental hygiene, occupational therapy, emergency rescue, clinical pathology), (2) gave voluntary consent to participate in the study, and (3) could be able to understand the content of the research and complete the survey. Those with psychiatric history were excluded.

Sampling of the subjects was done using convenience sampling. The researcher posted a ‘recruitment of research subjects’ document consisting of a research description and a questionnaire on the online bulletin board of the student council of each university, and collected data using an online questionnaire for those who expressed their willingness to participate. The sample size was calculated using the guideline for the logistic regression study proposed by Peduzzi et al. [17]. As a result of inputting proportions of cases to 0.5 and independent variables to 11, the minimum number of the samples was 200. The sample size for this study was determined to be 223, considering the dropout rate of 10.0%. As a result, a total of 229 subjects participated in the online survey, and there were no dropouts.

3. **Instruments**

1) **General characteristics**

The general characteristics consisted of gender, age, grade, major, self-rated health, completion of prevention education related to COVID-19, sources of information related to COVID-19, and the existence of a family member with a chronic disease.

2) **Risk perception of COVID-19**

A single-item Graphic Rating Scale (GRS) used by Park et al. [18] was adopted to measure the subjects’ risk perception of COVID-19. The subjects answered the question “How dangerous do you feel COVID-19 is?” on a scale of 0 to 10, with the higher number referring to a higher risk perception of the disease. The validity of the instrument items was validated by a group of experts (5 nursing professors, 2 public health professors, and 3 infection control nurses).

3) **Efficacy of preventive behaviors related to COVID-19**

In this study, efficacy of preventive behaviors related to COVID-19 refers to the perception of those behaviors’ effects. Five items (e.g., wearing a mask helps prevent COVID-19) used in the research conducted by Lee & You [8] were used to measure efficacy; authorization to use the tool was obtained from the developer. As the research by Lee & You [8] lacked explanations for the tool’s validity and reliability, this study organized a group of experts (5 nursing professors, 2 public health professors, and 3 infection control nurses) to have the content validity verified. No modifications were made to the items as the content validity was verified within 0.9-1.0 of the content validity index for individual items (I-CVI) and .98 of the average content validity index for scale (S-CVI/Ave). Cronbach’s α was .90 as a result of conducting a preliminary survey involving 40 college students to verify the tool’s reliability. Each item was measured on a 5-point Likert scale, and higher points referred to the greater perceived
effects of the preventive behavior. Cronbach’s α for the study was .88.

4) Awareness of governmental response

Five items used in the research conducted by You [19] were used to measure the awareness of governmental response, and authorization to use the tool was obtained from the developer. The tool consisted of five items (e.g., The health authorities are doing well in the prevention of COVID-19) to measure the awareness of the government’s quarantine, treatment, and information provision related to COVID-19. As You [19]’s research lacked explanations for the tool’s validity and reliability, this study organized a specialist group (5 nursing professors, 2 public health professors, and 3 infection control nurses) to have the content validity verified. No modifications were made to the items as the content validity was verified with .93 of the content validity index for individual items (I-CVI) and .90 of the average content validity index for scale (S-CVI/Ave). Cronbach’s α was .90 as a result of conducting a preliminary survey involving 40 college students to verify the tool’s reliability. Each item was measured on a 5-point Likert scale, with 5 points referring to a more positive perception towards the government’s efforts to curb the spread of COVID-19. Cronbach’s α for the study was .91.

5) Practice of preventive behaviors for COVID-19

Items developed by Park et al. [18] were used to measure the implementation of preventive behaviors. A total of six items, three items related to social distancing (e.g., I canceled or postponed meetings with friends, eating outside, sports matches, shopping, etc.) and three items related to personal quarantine (e.g., I wore a mask whenever I went out). The rate of implementation was measured on a 5-point Likert scale with 5 points referring to being more engaged in practicing preventive behaviors for COVID-19. Cronbach’s α was .76 in the research conducted by Park et al.[18], and it was .87 in this study. For the analysis in this study, since it is ideal to keep the ratio of cases similar in logistic regression analysis [17], considering that the median was 4.33 and the mean was 4.24, it was classified into a high practice group and a low practice group based on the average.

4. Ethical Considerations

The study was initiated after acquiring approval from the Institutional Review Board (IRB) of the institution (IRB No. WS-2020-09). The survey instructions clearly stated the study’s purpose, method, voluntary participation, and free withdrawal, as well as there being no disadvantages for not participating in the study, for the ethical protection of the subjects. The subjects were instructed to participate in the study voluntarily through the consent form for participation. Information that can be used to identify the subject such as name and the year of admission were not collected, and the collected information was encoded and stored on a locked personal computer.

5. Data Collection

The data for the study were collected from July 29 to August 2, 2020. After making an online survey consisting of an explanation of the study and a questionnaire, a preliminary survey was conducted on two freshmen enrolled in Woosuk University to check whether the online survey needed improvements in readability and understanding of the items before conducting the primary survey. The team posted a document stating, "Recruiting subjects for a study," on the online bulletin board of the nursing college and public health college in two universities. After explaining the purpose, method, and voluntary participation, students that understood the purpose of the study and wished to participate voluntarily were asked to fill out the consent form for participating in the online survey and then complete the survey. Subjects that completed the survey were provided with a gift.

6. Data Analysis

The collected data were analyzed as written below using the SPSS/WIN 24.0 program. The general characteristics were analyzed through descriptive statistics, using frequency, percentage, average, and standard deviation. Risk perception of COVID-19, efficacy of preventive behaviors, awareness of governmental response, and practice of preventive behaviors were analyzed through descriptive statistics. The differences in preventive behaviors for COVID-19 according to the general characteristics, risk perception, efficacy of preventive behaviors, and awareness of governmental response were analyzed using χ² test and independent t-test. Fisher’s exact test was performed to determine differences by grade. Subsequently, a binary logistic regression analysis was conducted to identify the predictor of preventive behaviors for COVID-19. The results were presented as odds ratio (OR) and 95% confidence intervals (CIs). All p values < .05 were considered to be indicating statistical significance.
## RESULTS

### 1. General Characteristics, Risk Perception, Efficacy of Preventive Behaviors, Awareness of Governmental Response, and Practice of Preventive Behaviors

Among the subjects, 80.3% were women students and the average age was 20.08±1.81 years. Looking at the participant's major, students studying dental hygiene accounted for 32.3%, and nursing students accounted for 30.6%. 93.5% of the respondents replied that they were in a healthy state, and 76.9% of the respondents received education related to COVID-19. Also, 33.2% had a family member diagnosed with a chronic disease (Table 1).

The average risk perception of COVID-19, efficacy of preventive behaviors efficacy of preventive behaviors, and average awareness of governmental response were 8.35±1.55, 4.53±0.58, and 4.00±0.60, respectively. The average practice of preventive behaviors was 4.24±0.57 (Table 2).

### 2. Differences in the Practice of Preventive Behaviors for COVID-19 Based on General Characteristics

The differences in practice of preventive behaviors for COVID-19 according to general characteristics are shown in Table 1. Women students were found to be more engaged in practicing preventive behaviors than men students ($\chi^2=4.24$, $p=.039$), and students who acquired information about COVID-19 from the Korea Disease Control and Prevention Agency (KDCA) were more likely to practice preventive behaviors than students who did not ($\chi^2=5.36$, $p=.021$).

### 3. Differences in the Practice of Preventive Behaviors for COVID-19 according to Risk Perception, Efficacy of Preventive Behaviors, and Awareness of Governmental Response

The practice of preventive behaviors for COVID-19 showed a statistically significant difference in risk percep-

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### Table 1. The Differences of Preventive Behaviors COVID-19 by Characteristics ($N=229$)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>Total ($n=229$)</th>
<th>Low group ($n=111$)</th>
<th>High group ($n=118$)</th>
<th>$\chi^2$ ($p$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Men</td>
<td>45 (19.7)</td>
<td>28 (25.2)</td>
<td>17 (14.4)</td>
<td>4.24 (.039)</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>184 (80.3)</td>
<td>83 (74.8)</td>
<td>101 (85.6)</td>
<td></td>
</tr>
<tr>
<td>Age (year)</td>
<td>18</td>
<td>32 (14.0)</td>
<td>16 (14.4)</td>
<td>16 (13.6)</td>
<td>3.28 (.349)</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>72 (31.4)</td>
<td>29 (26.1)</td>
<td>43 (36.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>63 (27.5)</td>
<td>35 (31.5)</td>
<td>28 (23.7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\geq$21</td>
<td>62 (27.1)</td>
<td>31 (28.0)</td>
<td>31 (26.3)</td>
<td></td>
</tr>
<tr>
<td>Year in college</td>
<td>1st year</td>
<td>84 (36.7)</td>
<td>41 (36.8)</td>
<td>43 (36.4)</td>
<td>NA (.719)†</td>
</tr>
<tr>
<td></td>
<td>2nd year</td>
<td>72 (31.4)</td>
<td>32 (28.8)</td>
<td>40 (33.9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3rd year</td>
<td>70 (30.6)</td>
<td>37 (33.3)</td>
<td>33 (28.0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4th year</td>
<td>3 (1.3)</td>
<td>1 (0.9)</td>
<td>2 (1.7)</td>
<td></td>
</tr>
<tr>
<td>Major department</td>
<td>Dental hygiene</td>
<td>74 (32.3)</td>
<td>35 (31.5)</td>
<td>39 (33.1)</td>
<td>8.27 (.082)</td>
</tr>
<tr>
<td></td>
<td>Nursing</td>
<td>70 (30.6)</td>
<td>26 (23.4)</td>
<td>44 (37.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occupational therapy</td>
<td>39 (17.0)</td>
<td>23 (20.7)</td>
<td>16 (13.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emergency rescue</td>
<td>30 (13.1)</td>
<td>16 (14.4)</td>
<td>14 (11.9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clinical pathology</td>
<td>16 (7.0)</td>
<td>11 (10.0)</td>
<td>5 (4.2)</td>
<td></td>
</tr>
<tr>
<td>Perceived health status</td>
<td>Healthy</td>
<td>214 (93.5)</td>
<td>105 (94.6)</td>
<td>109 (92.4)</td>
<td>0.46 (.497)</td>
</tr>
<tr>
<td></td>
<td>Un-healthy</td>
<td>15 (6.5)</td>
<td>6 (5.4)</td>
<td>9 (7.6)</td>
<td></td>
</tr>
<tr>
<td>COVID-19 education</td>
<td>Yes</td>
<td>176 (76.9)</td>
<td>85 (76.6)</td>
<td>91 (77.1)</td>
<td>0.00 (.923)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>53 (23.1)</td>
<td>26 (23.4)</td>
<td>27 (22.9)</td>
<td></td>
</tr>
<tr>
<td>Sources of information:</td>
<td>KDCA</td>
<td>43 (18.8)</td>
<td>14 (12.6)</td>
<td>29 (24.6)</td>
<td>5.36 (.021)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>186 (81.2)</td>
<td>97 (87.4)</td>
<td>89 (75.4)</td>
<td></td>
</tr>
<tr>
<td>Chronic disease in the</td>
<td>Yes</td>
<td>76 (33.2)</td>
<td>34 (30.6)</td>
<td>42 (35.6)</td>
<td>0.63 (.425)</td>
</tr>
<tr>
<td>cohabitation family</td>
<td>No</td>
<td>153 (66.8)</td>
<td>77 (69.4)</td>
<td>76 (64.4)</td>
<td></td>
</tr>
</tbody>
</table>

COVID-19=Coronavirus disease 2019; KDCA=Korea Disease Control and Prevention Agency; † Fisher’s exact test.
4. Factors Related to the High Practice of Preventive Behaviors for COVID-19

To identify factors related to the high practice of preventive behaviors for COVID-19, a logistic regression analysis was conducted with gender and sources of information for COVID-19 (KDCA) - general characteristics that showed a significant difference in relation to the practice of preventive behaviors - as well as the three major variables (risk perception of COVID-19, efficacy of preventive behaviors, and awareness of governmental response) as independent variables.

Factors related to the high practice of preventive behaviors for COVID-19 include acquiring COVID-19 information from KDCA, efficacy of preventive behaviors, and awareness of governmental response. It was identified that students who acquire information about COVID-19 from the KDCA were more likely to engage in preventive behaviors than those who did not (OR 2.31, 95% CI=1.01~5.61, p=.048). Furthermore, it appeared that the efficacy of preventive behaviors (OR 15.24, 95% CI=6.62~34.04, p<.001) and the awareness of governmental response (OR 1.84, 95% CI=1.04~3.24, p=.034) were relevant with the practice of preventive behaviors for COVID-19 (Table 3).

DISCUSSION

This study aimed to identify the factors related to health care related major students’ preventive behaviors for COVID-19 and provide the findings as the basic data for the development of educational programs for the capacity improvement of preventive behaviors in response to new infectious diseases in the future.

Significant factors related to the practice of preventive behaviors for COVID-19 were identified as the information acquisition route, efficacy of preventive behaviors, and awareness of governmental response.

For the sources of COVID-19 information, students that acquired information from the KDCA were found to be more active in practicing preventive behaviors. In the case of SARS, which was a similar virus to COVID-19, people who thought they were getting information from reliable sources were not highly anxious about the disease and actively practiced preventive behaviors [5].

### Table 2. Preventive Behaviors COVID-19 by Major Variables

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total M±SD</th>
<th>Low group (n=111) M±SD</th>
<th>High group (n=118) M±SD</th>
<th>t (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk perception</td>
<td>8.35±1.55</td>
<td>8.04±1.60</td>
<td>8.64±1.44</td>
<td>-3.01 (.003)</td>
</tr>
<tr>
<td>Efficacy of preventive behaviors</td>
<td>4.53±0.58</td>
<td>4.21±0.63</td>
<td>4.82±0.29</td>
<td>-9.46 (&lt;.001)</td>
</tr>
<tr>
<td>Awareness of governmental response</td>
<td>4.00±0.60</td>
<td>3.82±0.59</td>
<td>4.17±0.57</td>
<td>-4.64 (&lt;.001)</td>
</tr>
<tr>
<td>Preventive behaviors COVID-19</td>
<td>4.24±0.57</td>
<td>3.75±0.38</td>
<td>4.70±0.25</td>
<td>-21.76 (&lt;.001)</td>
</tr>
</tbody>
</table>


### Table 3. Factors related to High Preventive Behaviors for COVID-19

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men (ref.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>1.77</td>
<td>0.74~4.21</td>
<td>.196</td>
</tr>
<tr>
<td>Sources of information: KDCA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No (ref.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.31</td>
<td>1.01~5.61</td>
<td>.048</td>
</tr>
<tr>
<td>Risk perception</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.13</td>
<td>0.89~1.42</td>
<td>.291</td>
</tr>
<tr>
<td>Efficacy of preventive behaviors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15.24</td>
<td>6.62~35.04</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Awareness of governmental response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.84</td>
<td>1.04~3.24</td>
<td>.034</td>
</tr>
</tbody>
</table>

x²(p)=93.04 (<.001), Nagelkerke's R²=0.44, Hosmer–Lemeshow x²=7.99 (p=.434)

CI=confidence interval; COVID-19=coronavirus disease 2019; KDCA=Korea Disease Control and Prevention Agency; OR=odds ratio; ref.=reference.
Factors Related to the Practice of Preventive Behaviors for COVID-19 among Students with Healthcare-related Majors

study conducted on university students in Portugal reported that subjects who acquired official information from the websites of public organizations had a better understanding of health information related to COVID-19 than those who used social media as their information resource [22]. As such, it was discovered that people who accepted information from public organizations with public confidence were more likely to practice effective preventive behaviors for COVID-19. Hence, one strategy should be to provide knowledge about public hygiene in messages to students based on the guidelines from public organizations with public confidence in cases of new infectious diseases to encourage students to practice preventive behaviors.

In this study, efficacy of preventive behaviors was identified as the biggest relevant factor to the practice of preventive behaviors for COVID-19. This finding is similar to efficacy of preventive behaviors being a significant influential factor in the general population’s practice of preventive behaviors for COVID-19 [8]. Health-related efficacy refers to an individual’s belief in their ability to solve an issue in a given situation, and higher self-efficacy is reported to increase the practice of self-management [28]. The transtheoretical model states that people perform health behaviors by making decisions through the effects and losses created in the course of various changes [29]. Among the phases of change, efficacy is the most important factor in the phase where people consider practicing health behaviors [30]. Trust in the effects of preventive behaviors was emphasized as a major factor that influences people’s practice of preventive behaviors in public health crisis situations like the spread of a new infectious disease [31]. It is, therefore, necessary to encourage students majoring in health care to have trust in the effects of preventive behaviors for COVID-19 by providing objective and accurate knowledge about those behaviors to boost the efficacy of preventive behaviors.

Next, this study identified that the awareness of governmental response is in relation to preventive behaviors. This finding is in line with the results of previous research, which reported that people’s positive awareness of governmental response led to the more active practice of preventive behaviors [32]. When the government provided information about infectious diseases quickly, accurately, and transparently, the treatment of COVID-19 patients and people’s practice of preventive behaviors improved [33]. It is widely discussed in studies that the success of a government policy is in a very high causal relationship with the target group’s acceptance of the policy [34]. Policy acceptance is defined as a subjective term, referring to whether the target group will have a positive or negative (resistant) acceptance of the policy [30]. Hence, the public’s positive policy acceptance is a highly critical variable in the overall policy process as the level of public acceptance influences the postponement and implementation of the policy [27].

Although significance was lost in the multivariate analysis, a significant difference was identified in gender and risk perception regarding the practice of preventive behaviors for COVID-19 in the univariate analysis. It was found that women students were more engaged in practicing preventive behaviors for COVID-19 than men students. Previous studies have also reported that women are more likely to practice preventive behaviors than men as they have higher disease susceptibility [20]. For women, the risk perception increased if there was greater uncertainty, like with COVID-19 [20], which led to their greater anxiety about emerging infectious diseases [21]. There is a need for an educational program that reflects such gender-based differences in the acceptance of preventive behaviors. Risk perception of COVID-19 was identified to be in relation to the practice of preventive behaviors in the previous research [3,22]. The influence of risk perception on health activities has steadily been verified through the HBM [23]. As it is impossible to control risk completely, health education needs to be in place to boost understanding of possible risks as well as how to choose and practice recommended behaviors [24]. How people perceive such a risk plays a critical role in the social spread of the risk [25]. Risk perception differs by the information an individual accepts. In particular, information literacy, which refers to an individual’s ability to access and utilize necessary information, is known to be influential in risk perception as well as changes in health-related behaviors [26]. Previous studies about risk perception and preventive behaviors report that groups with a high level of rule compliance and low personal autonomy, such as children, regard preventive behaviors as a social rule and practice them well, regardless of how much they perceive risk [27]. In other words, risk perception is highly important in groups of college students with relatively high autonomy as they are freer from rule compliance. For college students, who have greater autonomy than teenagers, risk perception can be used as a key target to boost preventive behaviors [8].

This study has a number of limitations. First, the findings of the study are insufficient for generalization as the subjects only involved students enrolled in two universities. Yet, this study tried to reflect the characteristics of student groups by surveying students with health care re-
lated majors. The researchers suggest conducting repeated studies involving various regions and environments to increase the representativeness of the findings. Also, as a cross-sectional study, the study does not suggest a direction for causal relationships. Finally, in this study, the one item GRS was used to measure risk perception for COVID-19. While this is efficient for researchers and participants, it is limited in its ability to capture the complexity of the psychological dimensions. We suggest repeated studies using validated and reliable instruments to measure risk perception for COVID-19 in the future.

Regardless of the limitations, it is meaningful that this study identified factors that affect the practice of preventive behaviors for COVID-19 in groups of students majoring in health care. Identifying factors related to the preventive behaviors of students with health care related majors is important for the prevention of an infectious disease’s spread in the community as they will be in charge of public health in medical institutions in communities after graduation. It is expected that the findings of this study are used as basic evidence for the development of educational programs for infectious disease prevention targeting students majoring in health care. Based on the results of this study, it is necessary to develop a multidimensional integrated program that considers psychosocial factors in addition to simply providing knowledge and training in infection-related education.

CONCLUSION

This study showed that the practice of preventive behaviors for COVID-19 related to sources of information, efficacy of preventive behaviors, and awareness of governmental response among health care related major students. Based on the results of this study, it is necessary for the government to promptly provide accurate information about any infectious disease in the future and be prepared with uniform and consistent guidelines in response to it, in order to promote infection prevention behaviors among students majoring in health care. In addition, the students will be able to play the role of healthcare providers who provide and motivate patients to practice higher levels of infection prevention behaviors in the medical field after graduation if they are supported by the development and application of customized programs such as disaster response drills in the undergraduate curriculum to increase the efficacy of their infection prevention behaviors.

CONFLICTS OF INTEREST

The authors declared no conflict of interest.

AUTHORSHIP


DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

REFERENCES

7. Chen CYC, Lei M. Psychosocial factors associated with mask-wearing behavior during the COVID-19 pandemic. Psychol-


30. Violant-Holz V, Gallego-Jimenez MG, Gonzalez-Gonzalez CS,


