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### Major Article

# Motivating factors of compliance to government's COVID-19 preventive guidelines: An investigation using discrete choice model

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Key Words: Health behavior Infection Conditional logit model **Background:** The spread of coronavirus disease 2019 (COVID-19) has resulted in a worldwide pandemic. We aimed to identify the factors that motivate public compliance with the government's COVID-19 preventive recommendations.

*Methods:* Focus group interviews were conducted to identify influencing factors. The relative importance of each factor was investigated through a survey, based on a discrete choice model, from February to June, 2021 in South Korea.

**Results:** "Severity of COVID-19 symptoms" (relative importance [magnitude of attribute coefficients]: 28.40%) and "risk of infection" (27.50%) were the most influential health-related factors, followed by social consequences of infection, including "cessation of social activities due to self-quarantine" (19.77%), "risk of personal information being disclosed when infected and social criticism on the infected person" (15.78%), and "risk of spreading infection" (8.55%). Respondents behaved differently based on their socioeconomic characteristics and COVID-19 experience.

**Discussion:** The perceived severity of symptoms was a strong motivator among fragile individuals, such as women and older adults. "Cessation of social activities" was the most influential factor for those infected with COVID-19, while "risk of infection" was for those whose acquaintances were infected.

**Conclusions:** The provision of information regarding COVID-19 to the public must be tailored based on an understanding of behavioral differences.

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### BACKGROUND

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus.<sup>1</sup> Considering that the virus is transmitted through an infected person's respiratory droplets, the spread of the disease has been quick, resulting in a worldwide pandemic.<sup>2</sup> Following the World Health Organization guidelines,<sup>3</sup> the national health authorities of Korea declared preventive recommendations for the public to protect themselves and prevent the spread of COVID-19, such as wearing a mask, washing hands frequently, and social distancing. Even after the availability of COVID-19 vaccines and the

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Conflicts of interest: Sol Kwon has received a research grant from the Health Fellowship Foundation. The remaining authors have no conflicts of interest to declare. achievement of a high vaccination rate, the Korean government continues to emphasize strong preventive recommendations since they have proven effective in preventing the spread of COVID-19.<sup>4</sup> However, constant infection outbreaks in communities and group facilities in Korea suggest that individuals may not adequately follow the government's preventive recommendations.

Among the many variables influencing individuals' compliance to preventive recommendations, "choice" based on their beliefs or experience is one of the primary drivers of compliance.<sup>5</sup> Various factors influence the choice-making process, such as a lack of access to supplies and need to work in person (because of which isolation or quarantine is impossible), based on the individual's job and economic situation. Additionally, the magnitude of each factor's influence varies according to the individuals' perceived utility toward that factor.<sup>6</sup> Therefore, identifying the factors affecting compliance with preventive recommendations and decision-making processes would help prepare public education strategies for effective infection

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control. Few studies have investigated individuals' choices regarding the implementation of preventive actions. For example, Eshun-Wilson et al. investigated public preference for various government social distancing policies to contain the spread of COVID-19 in the United States.<sup>7</sup> Reed et al. determined the willingness to accept trade-offs among COVID-19 risk, social distancing restrictions, and economic impact on Americans.<sup>8</sup> In addition, the public's preference for various government policies to respond to COVID-19 has been measured in various countries, such as the United Kingdom and Australia.<sup>9,10</sup>

These previous studies are meaningful in terms of understanding public behaviors and attitudes toward infection-prevention actions. However, the findings of these studies may not be generalized to different countries because the driving forces of compliance with preventive recommendations would be affected by the severity of the pandemic, healthcare system, government policy, and social norms of each country. Additionally, prior studies did not investigate the factors affecting the implementation of preventive behaviors but instead studied their preferences toward it. Thus, the authors of this study conducted nationwide research to identify the factors affecting individuals' decision-making regarding compliance with COVID-19 preventive recommendations in South Korea. The relative influence of the identified factors was analyzed using a discrete choice model (DCM). Furthermore, how the relative influence of these factors varied according to socioeconomic characteristics and individual COVID-19 experiences was investigated.

#### **METHODS**

### Questionnaire development using the DCM

The DCM is a stated preference survey method that measures respondents' preferences for various alternatives constructed by combining two or more attributes.<sup>11</sup> It measures the overall utility of alternatives or partial utility of each attribute by selecting a specific alternative.<sup>12</sup> This approach has been widely used in healthcare to evaluate the relative importance of alternatives or attributes in decision-making processes related to health outcomes or healthcare services.<sup>13</sup> In the DCM, respondents are assumed to be rational decision-makers who make choices to maximize utility. When two options exist, the DCM assumes that an individual is willing to exchange one attribute with another at a given level.<sup>14</sup>

An experimental design refers to the process of creating choice alternatives by combining attribute levels. In the DCM, two or more alternatives created through an experimental design are presented

to respondents in pairs, and then only one alternative needs to be selected, thereby measuring the utility of the alternative chosen or each attribute.<sup>12</sup> The process of constructing an experimental design used in this study was as follows. First, focus group interviews (FGIs) were conducted on February 25 and 26, 2021, with 12 people divided into two age groups (20-30s and 40-50s) to identify potential factors (attributes) that affect their decisions to comply with the COVID-19 preventive action recommended by the Korean government. The FGI participants were recruited from the panel members of a professional survey institution named "Embrain" (http://www.embrain.com/eng). This institution has a nationwide research panel of more than one million people. Therefore, it represents the general population by reflecting the distribution of sex, age, and residence of the Korean population.<sup>15</sup> Second, after selecting the factors voted by the FGI participants as having the most significant influence, the levels of each factor were determined based on discussions among the FGI participants and the COVID-19 status in South Korea in May 2021. Third, choice alternatives, which are specific combinations of attributes and their levels, that respondents will evaluate in the survey (Fig 1) were created using SAS 9.4 (SAS Institute Inc., Cary, NC). Fourth, an online survey was conducted from May 28 to June 2, 2021, to identify the relative importance of each factor in decision-making in compliance with the government's preventive advice related to COVID-19. A total of 1,031 panel members from "Embrain" aged 20 years and over participated in the survey. Respondents were asked a series of questions on which of the two alternatives would lead to better compliance with preventive recommendations. Additionally, the survey collected information on socioeconomic characteristics and experience with the COVID-19 infection. This study was approved by the Institutional Review Board (IRB) of Yonsei University [IRB No. 7001988-202201-HR-1080-06].

### Data analysis

DCM analysis follows the random utility theory (RUT), which through probability describes an individual's choice and explains preference as an indirect function of utility. This function is formulated<sup>16</sup> as follows:

$$U_{ij} = \beta X_{ij} + \gamma_j Z_i + \varepsilon_{ij} \ (i = 1, 2, ..., I, j = 1, 2, ..., J)$$
(1)

Where  $U_{ij}$  is the utility of alternative *j* chosen by respondent *i*;  $X_{ij}$  is the vector of regressors for the attributes of alternative *j* evaluated by respondent *i*; and  $Z_i$  is the vector of regressors for the characteristics

1. Of the two alternatives, please choose the one in which you are more likely to comply

with COVID-19 personal quarantine rules.



□ Alternative 1 □ Alternative 2

Fig 1. Example of choice alternatives.

of respondent *i*, with the corresponding parameter vectors  $\beta$  and  $\gamma$ , respectively, and is the random component  $\varepsilon_{ij}$ .

The probability  $P_{ij}$  of respondent *i* choosing alternative *j* is given as follows:

$$P_{ij} = \frac{\exp(\beta X_{ij} + \gamma_j Z_i)}{\sum_{j=1}^{J} \exp(\beta X_{ij} + \gamma_j Z_i)}, \ (i = 1, 2, \dots, I, j = 1, 2, \dots, J)$$
(2)

In this study, the utility of each attribute was measured using a conditional logit model, which assumes that the distribution of error terms in the RUT follows a type 1 extreme value distribution and is independent of responders and alternatives.<sup>16</sup> The parameters in the conditional logit model were estimated using the maximum likelihood method based on the responses of all participants. We also conducted subgroup analyses according to the respondents' socioeconomic characteristics and COVID-19 experiences to investigate how the motivating factors varied across subgroups.

### RESULTS

#### Questionnaire development using the DCM

#### Results of FGIs

A total of 12 participants were recruited equally by gender and age. The surveyed participants resided in Seoul, Gwangju, Daejeon, and Gyeonggi-do, and participants living in Seoul and Gyeonggi-do accounted for 41.77% of the total, while those living in Gwangju and Daejeon accounted for 8.33%. The participants' occupations varied; they were managers/professionals, office workers, salespersons/service industry workers, students, housewives, and unemployed/ others. From the FGIs, the researchers identified factors (attributes) that may affect individuals' decisions to comply with the government's preventive advice against the spread of COVID-19. They were "risk of being infected," "risk of spreading the infection to surroundings," "temporary cessation of social and work activities for a living due to self-quarantine following infection (hereafter, cessation of social and work activities due to self-quarantine)," "severity of infection symptoms," "severity of complication and sequela of infection," "legal regulations and penalties for noncompliance with preventive recommendations," "social criticism following noncompliance with preventive recommendations," and "risk of personal information being disclosed when infected and social criticism on the infected person (hereafter, risk of personal information being disclosed and social criticism)."

Based on the participants' vote in the FGIs, the following were the 5 most influential factors selected: "risk of being infected," "risk of spreading the infection to surroundings," "cessation of social and work activities due to self-quarantine," "severity of infection symptoms," and "risk of personal information being disclosed and social criticism" (Table 1).

#### Experiment design

Two of the five factors had three levels, and the other three had two levels; thus, the total number of alternatives was 72 ( $=2^3 \times 3^2$ ). Since response efficiency may decrease when 72 alternatives are presented to survey participants, a fractional factorial design using orthogonality was applied by running SAS macro %MktRuns. When 24 alternatives were used, orthogonality was not completely satisfied because the interaction between 2 factors with 3 levels could not be estimated. However, when only the main effect of each factor was measured without considering the interaction between the factors, it was possible to measure it with a smaller number of alternatives.<sup>11</sup> A previous study indicated that the response efficiency was lowered when more than 16 pairs of alternatives were provided.<sup>12</sup> Therefore, 24 alternatives (ie, 12 pairs of alternatives) were generated. Pairs of alternatives were created using SAS Macro %MktEx software (Fig 1).

The absolute D-efficiency of the 24 alternative sets was estimated to be 99.6071, which is close to 100, indicating the high statistical efficiency of the alternative configuration.<sup>13</sup> All attribute levels appeared in the same number for all alternatives, indicating that the set of alternatives was balanced. Finally, after pairing 24 alternatives, a questionnaire was created to select one alternative that would be greater motivated to comply with the COVID-19 preventive action among the two alternatives.

#### Survey results

#### Basic characteristics of the respondents

Respondents were relatively evenly distributed across different age groups (Table 2). The capital city (30.26%) and its neighboring region (Gyeonggi-do, 26.22%) accounted for the highest proportion of the respondents' residential areas, reflecting the heavy population concentration in the capital city area in South Korea. The distribution of the respondents' occupations was similar to the national statistics, but fewer single-person households and a higher number of people with graduate school education were included.<sup>17</sup>

#### DCM analysis results

The conditional logit model showed that all 5 factors were statistically significant in motivating individuals to comply with COVID-19 preventive recommendations (Table 3). For the factor of "risk of being infected," the motivation to comply with preventive recommendations was 1.44 times higher when there were 500 confirmed cases per day (adjusted odds ratio [aOR]: 1.44) than when there were 100 cases and increased to 1.73 times when there were 1,000 cases. Adjusted ORs increased as the "severity of infection symptoms" worsened; 1.28 when infection symptoms required short-term (<one month) treatment versus infection symptoms did not interfere with daily life; and 1.75 for symptoms requiring long-term (≥one month) treatment. In the case of "more than one month of cessation of social and work activities due to self-quarantine," the motivation to follow preventive recommendations was 1.53 times higher than that for "less than one month of cessation." People opted to comply with preventive recommendations when the risk of spreading the infection to the surroundings was high, measured as >1 on the infection reproduction index (aOR compared to  $\leq 1$  on the infection reproduction index: 1.23). When the "risk of personal information being disclosed and social criticism" was considered strong, the motivation to comply with preventive recommendations was 1.42 times higher than when it was weak.

The relative importance of each independent variable in explaining the variation in the dependent variable in a conditional logit model was calculated by comparing the range of ORs for a variable with that of all the variables.<sup>18</sup> For example, the range of aOR for the variable of "severity of infection symptoms" was 0.75 because the estimated aORs ranged from 1 [for level 1 (reference group): no interference with daily life due to infection symptoms] to 1.75 (for level 3: >one-month treatment). Thus, the relative importance of the "severity of infection symptoms" among the five factors in explaining the decision to comply with COVID-19 preventive recommendations was calculated to be 28.40% (=  $[0.75/\{0.73 + 0.75 + 0.53 + 0.23 + 0.42\}] \times 100$ ). Based on this method, it was found that "severity of infection symptoms" had the most significant influence on the motivation to comply with COVID-19 preventive recommendations (relative importance was 28.40%), followed by "risk of being infected" (27.50%), "cessation of social and work activities due to self-quarantine"(19.77%), "risk of personal information being disclosed and social criticism" (15.78%), and "risk of spreading the infection to surroundings" (8.55%).

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#### Table 1

Factors motivating to comply with the government's preventive recommendations against the spread of COVID-19

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	Factors (attributes)	Level 1	Level 2	Level 3
	1. Risk of being infected 2. Severity of infection symptoms	<100 infected cases per day in the nation No interference with daily life	500 infected cases per day <one-month and="" hospitalization<="" or="" td="" treatment=""><td>1,000 infected cases per day ≥one-month treatment and/ or hospitalization</td></one-month>	1,000 infected cases per day ≥one-month treatment and/ or hospitalization
	3. Cessation of social and work activities due to self-quarantine following infection	<one month<="" td=""><td>≥one month</td><td>or nospitalization</td></one>	≥one month	or nospitalization
	4. Risk of spreading the infection to surroundings	Infection reproduction index: $\leq 1.0$	Infection reproduction index: >1.0	
	5. Risk of personal information being dis- closed when infected and social criticism of the infected person	Low risk of personal information being disclosed and weak social criticism	High risk of personal information being disclosed and strong social criticism	

\*The level of each factor was determined by referring to literature, the current status of infection in Korea at the time of the survey, media reports, and so on. For example, there were an average of 100 to 500 confirmed cases per day at the time, and when this number rose to more than 1,000 confirmed cases, extensive news reports appeared. Infected patients at the time were divided into asymptomatic patients, mild patients receiving less than a month of treatment, and severe patients receiving more than a month of treatment. Infected people were quarantined for a maximum of one month at the time. We referred to news articles that report the transmission power as the infection reproduction index, which means the average number of secondary infections that occur as a result of an infected person. For the "risk of personal information being disclosed and social criticism," it was difficult to set an indicator, so it was simply set as a situation with and without blame.

Subgroup analyses results

To investigate how the relative importance of each factor differed according to the respondents' characteristics, separate conditional logistic regression analyses were performed for each subgroup (Fig 2).

(1) Sex and age: While "risk of being infected" had the greatest influence on men to comply with preventive recommendations (relative importance: 32.13%), "severity of infection symptoms (31.75%)" had on women. For the younger groups in their 20s and 30s, the "risk of being infected (31.55% and 29.19%)" was the most influential factor. For those above 40 years of age, the most significant factor was "severity of infection symptoms," its relative importance increasing as the respondents aged, from 26.83% in their 40s to 37.09% in their 60s. For people in their 20s, the relative importance of "cessation of social and work activities due to self-quarantine (20.28%)" and

#### Table 2

Socioeconomic characteristics and experience of COVID-19 of the survey respondents

Characteristics	No. respondents (%)	Characteristics	No. respondents (%)
Sex		Number of family members	
		living together	
Men	515 (49.95)	1	134 (13.00)
Women	516 (50.05)	2	204 (19.79)
Age, years		3	286 (27.74)
20-29	205 (19.88)	4	328 (31.81)
30-39	201 (19.50)	≥ 5	79 (7.66)
40-49	208 (20.17)	Have been infected with	
		COVID-19	
50-59	207 (20.08)	Yes	4 (0.39)
60-69	210 (20.37)	No	1027 (99.61)
Residential area		Acquaintance being infected	
		with COVID-19	
Seoul (capital city)	315 (30.55)	Yes	48 (4.66)
Busan	66 (6.40)	No	983 (95.34)
Daegu	46 (4.46)	Monthly household income	
		(million KW)	
Incheon	58 (5.63)	<200	100 (9.70)
Gwangju	23 (2.23)	200-<400	332 (32.20)
Daejeon	31 (3.01)	400-<600	324 (31.43)
Ulsan	22 (2.13)	600-<800	153 (14.84)
Gyeonggi-do	273 (26.48)	800-<1,000	80 (7.76)
Gangwon-do	23 (2.23)	≥1,000	42 (4.07)
Chungcheongbuk-do	25 (2.42)	Occupation	. ,
Chungcheongnam-do	23 (2.23)	Government officers/military workers	32 (3.10)
Jeollabuk-do	14 (1.36)	Managers/professionals	84 (8.14)
Jeollanam-do	20 (1.94)	Office workers	325 (31.52)
Gyeongsangbuk-do	27 (2.62)	Sales persons/service industry workers	79 (7.66)
Gyeongsangnam-do	46 (4.46)	Simple labor workers	61 (5.92)
Jeju-do	8 (0.78)	Small business owners	74 (7.18)
Sejong	11 (1.07)	Students	59 (5.72)
Education		Housewives	154 (14.94)
Middle school or less	12 (1.17)	Retirees	43 (4.17)
High school	197 (19.11)	Unemployed/others	120 (11.64)
College	701 (67.99)		· · ·
Graduate school or more	121 (11.74)		

IQR: interquartile range, KW: Korean won.

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#### Table 3

Conditional logistic regression results and relative importance of factors affecting compliance with the government's preventive recommendations

Influencing factors	Level	Adjusted OR* (95% CI)	Relative	importance
			%	Rank
Risk of being infected	<100 infected cases per day in the nation	ref	27.50	2
	500 infected cases per day	1.44 (1.37-1.52)		
	1,000 infected cases per day	1.73 (1.64-1.83)		
Severity of infection symptoms	No interference with daily life due to infection symptoms	ref	28.40	1
	<one-month and="" or<br="" treatment="">hospitalization</one-month>	1.28 (1.22-1.35)		
	≥one-month treatment and/or hospitalization	1.75 (1.66-1.85)		
Cessation of social and work activities	<1 month	ref	19.77	3
due to self-quarantine following infection	≥1 month	1.53 (1.47-1.59)		
Risk of spreading the infection to surroundings	Infection reproduction index: $\leq 1.0$	ref	8.55	5
	Infection reproduction index: $>1.0$	1.23 (1.18-1.28)		
Risk of personal information being dis-	Weak	ref	15.78	4
closed when infected and social criti- cism of the infected person	Strong	1.42 (1.37-1.48)		

\*ORs were estimated by adjusting for age, sex, educational level, residence area, occupation, monthly household income, number of family members living together, and experience of COVID-19.CI, confidence interval; OR, odds ratio.

"disclosure of personal information and social criticism" (19.28%) was ranked second and third, respectively, which was higher than those in the older age groups.

- (2) Residential areas: Residential areas were classified into four groups based on the cumulative incidence rate of COVID-19 per 100,000 residents in May 2021: ≥300, 200-300, 180-200, and less than 180. No patterned change was observed in the relative importance of each factor based on the magnitude of the regional cumulative incidence rate.
- (3) Number of family members: Based on the number of household members living together, the respondents were divided into 5 groups: single households and 2, 3, 4, and 5 family members. Among those living with ≥5 family members, the relative importance of "severity of infection symptoms (37.29%)" was more significant than in other groups (23.95%–29.86%). The relative importance of the "risk of spreading the infection to the surroundings" tended to increase as the number of people living together increased from 4.82% for single households to 16.28% for those with ≥5 family members.
- (4) Education and occupation: For those with the lowest educational level (ie, middle school graduates or less educated), the "risk of being infected" was the single most influential factor, with the dominant relative importance of 63.07%. The relative importance of "risk of being infected" was overwhelmingly high among government officers and military workers (40.5%) and students (42.25%). Unlike other occupation groups, "personal information being disclosed and social criticism" was ranked as the second most crucial factor for government officers and military workers. For simple laborers, the "risk of being infected" (2.5%) and "risk of spreading the infection to the surroundings" (14.2%) had less impact. The same tendency was observed for white-collar workers, such as managers, professionals, office workers, sales personnel, and service industry workers.
- (5) Experience of COVID-19: Those who suffered from COVID-19 showed that "cessation of social and work activities owing to selfquarantine" was the most influential factor (relative importance: 46.11%). For those with an acquaintance(s) being infected, "risk of being infected" had the greatest importance (36.47%), followed by "severity of infection symptoms" (23.43%).

### DISCUSSION

To prevent the spread of infectious diseases, such as COVID-19, it is critical to encourage the public to implement person-level preventive actions actively. The researchers conducted a national survey to understand the factors that motivate individuals to follow preventive policies and develop effective public communication and educational strategies to promote preventive actions.

Among the five factors identified in the present study, "severity of COVID-19 infection symptoms" (relative importance: 28.40%) and "risk of being infected" (27.50%) were the most influential factors for South Korean people to comply with the government's preventive recommendations against the spread of COVID-19. Compared with the other 3 factors, which mostly reflect the social consequences of the infection, these two factors are closely related to the health outcomes of the individuals. Therefore, these findings imply that health concerns are the main driving force behind public conformance to preventive recommendations. The health belief model (HBM) may explain how these two factors motivate individuals to act along with the preventive recommendations. According to the HBM, the likelihood of taking a health-favorable action increases as the perceived threat of disease is high, which can be formed by perceived susceptibility to and severity of the disease.<sup>19,20</sup> In this study, "risk of being infected" and "severity of infection symptoms" are considered to reflect perceived susceptibility to and severity of COVID-19, respectively.

The other three factors can be conceptualized as social factors. The factor of "cessation of social and work activities due to selfquarantine" describes the restrictions imposed on the individuals' social lives due to the infection. If an individual is willing to abide by the government's preventive recommendations fearing spreading the infection to their surroundings, this behavior may arise from the social responsibility the individual feels. Earlier, when the COVID-19 infection was just an epidemic, people often misbehaved by accusing the infected person of spreading the infection and stigmatizing them for misconduct. Such criticisms can damage an individual's social reputation.

When analyzing all the respondents, fear of being infected or the severity of the symptoms had a greater effect on the motivation of compliance behaviors than social factors. However, the results differed among the subgroups. For individuals with fragile health statuses, such as women and older groups, the perceived severity of

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Fig 2. Subgroup analyses results by socioeconomic characteristics and COVID-19 experience of respondents.

infection symptoms was a strong driving force for following preventive recommendations. In contrast, younger groups, especially those in their 20s who actively participate in social activities, were greatly influenced by social factors, such as the "cessation of social and work activities" and the "disclosure of personal information and social criticism." Those living with many family members were sensitive to the risk of spreading the infection. The result that those with the lowest educational level were mainly affected by the "risk of being infected" compared with those with higher education is consistent with a previous study conducted in Chile.<sup>21</sup> According to Cerda et al., the lower the educational level, the more difficult it was to obtain accurate information about COVID-19, which increased the fear of infection risk. It was interesting to observe that people behaved differently depending on their occupations. Among government officers and military workers, the "risk of being infected" was a dominant factor and the rank of "personal information being disclosed and social criticism" in terms of relative importance was highest among all the occupation groups. This may be due to them needing to be more careful than others so as not to be infected by COVID-19, considering their strict work culture regarding adherence to rules and the characteristics of their jobs protecting the public. The student group also showed a predominant "risk of being infected." As the participants of this study were adults above 20 years of age, the students were probably college or graduate students. Their strong concern about susceptibility to COVID-19 could have arisen from the high

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peer pressure of not being the source person who infects other school friends and colleagues. For laborers, the "risk of being infected" was ranked as the least important factor with astonishingly little importance (2.5%). Instead, the consequences of COVID-19 restricting their daily social and economic activities, as well as receiving social criticism, affected them more seriously than all the other occupation groups.

No differences were observed in the relative importance of each factor among the individuals from the residential areas with different cumulative incidence rates of COVID-19. This could be because the regional variation in cumulative incidence was insufficient to affect residents living in different regions at the time of the investigation. Alternatively, since South Korea is a small country and inter-regional exchange and movement are high, region-specific distinct attitudes and behaviors toward COVID-19 could not be developed.

While "cessation of social and work activities" was the most influential factor for those infected with COVID-19, "risk of being infected" was for those whose acquaintances were infected. This finding reveals that the interruption of daily life after getting infected caused the greatest discomfort to those who were actually infected. In contrast, the fear of being infected is the most significant driving force behind compliance with preventive recommendations for those directly witnessing the infection episodes of others.

This study has several limitations. First, only those 5 factors that were voted the most influential among those identified from the FGIs were incorporated into the survey questionnaire. This may lead to a

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limited understanding of public behavior regarding COVID-19. Second, the level of each factor was simplified to 2 or 3 to maintain a manageable number of alternatives. If more sub-levels for each factor were provided in the questionnaire, a more realistic decision-making process would be reflected. Third, although we did not attempt to limit the maximum age of participants for the FGIs and survey, only those 20-50 and 20-70 years of age, respectively, were recruited. This was due to the difficulty in recruiting those over 50 who were accustomed to video conferences. Additionally, most of those over 70 years of age were not familiar with online platforms. Further research including more diverse age groups is needed.

### CONCLUSION

Based on understanding behavioral differences according to individual characteristics, providing the public with various information regarding COVID-19 is recommended. The disclosure of accurate and useful information about the pandemic from the public perspective would help promote and educate people to comply with preventive guidelines actively and consequently restrain the spread of infection. The findings and methods of this study are expected to be useful in solving similar policy questions in other countries, as well as for similar outbreaks of infectious disease pandemics in the future.

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