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Study on Difference in Coronavirus-19 Related Anxiety between Face-to-face and Non-face-to-face Classes among University Students in South Korea

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ABSTRACT

Introduction: The Coronavirus-19 pandemic has thrown the world into survival trauma. The negative effects of anxiety on academic performance had been shown in many studies. The pandemic of Coronavirus-19 increases not only the symptoms associated with grief but also mental disorders such as post-traumatic stress, depression and anxiety disorder.

Aim and Objective: This paper examined the anxiety about Coronavirus-19 among university students who recently experienced face-to-face and non-face-to-face classes, to suggest a better class type for high-quality academic performance with less fear. The survey was conducted on 94 nursing college students in J. City, South Korea, from June 27 to June 30, 2020. The State Anxiety Inventory (Spielberger, 1975) was employed online.

Result: The findings showed that there was a significant difference ($t=12.113$, $p=.000$) in anxiety between face-to-face ($53.05\pm 9.41/80$) and non-face-to-face class groups ($37.46\pm 7.63/80$). That of face-to-face was 1.41 times higher than that of non-face-to-face. There were significant differences with regards to class preference ($t=12.113$, $p=.000$) and gender ($t=12.113$, $p=.000$) only in the face-to-face but not in the non-face-to-face group. The non-face-to-face preferred group had scored 1.22 times higher than the other group and females had scored 1.19 times higher than the males. These results were highly significant ($t=13.958$, $p=.000$) in the high anxiety than low anxiety group in both classes. The score above 40 in the high anxiety group (54.66 ± 7.215) of the face-to-face was 1.86 times higher than in the low group (29.33 ± 4.131). 93.62% belonged to the high anxiety group in the face-to-face group. Factors affecting anxiety were class preference ($\beta=-.546$, $p=.001$) and gender ($\beta=.244$, $p=.004$) in the face-to-face group. The explanatory power of these variables was 74.7%.

Conclusion: It is suggested that students are more worried about Coronavirus-19 spread within the classroom than about difficulties from the non-face-to-face class. In this study, the non-face-to-face class is recommended, especially, for non-face-to-face class preferred and female students, for better quality academic achievement in universities, without worry during Coronavirus-19 epidemic.

Key Words: Coronavirus-19, Face-to-face/non-face-to-face, Class preference, Gender, Anxiety

INTRODUCTION

The Coronavirus-19 pandemic has thrown the world into survival trauma. The number of Coronavirus-19 confirmed cases have exceeded 13,612(+61) in Korea and 13,690,000(+171,418) in the world. The number of deaths has exceeded 291(+2) in Korea and 586,778(+4,037) in the world. The fatality rate is 2.14% in Korea and 4.29% in the world, and affected countries by July 23, 2020, are 214.

Schools are closed in 143 countries worldwide. Many countries in the world closed their educational institutions to control the widespread of Coronavirus-19. These nationwide closures are impacting over 60% of the world's student population (1,184,126,508 learners) and 67.6% of total enrolled learners by May 25, 2020.

The negative effects of anxiety on academic performance had been shown in many studies. Anxiety is defined as feel-

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ings of unease, worry, tension and stress. It is usually accompanied by a situation that causes these feelings. Anxiety has a significant impact on academic achievement. Students with high anxiety can manage in simple or mechanical tasks, but not in complex and memory-demanding tasks such as high-level intellectual tasks.

A British survey reported that infectious diseases worsen people's mental health. The pandemic of Coronavirus-19 increases not only the symptoms associated with grief but also mental disorders such as post-traumatic stress, depression and anxiety disorder. Anxiety about the possibility of infection due to the outbreak of Coronavirus-19, and anxiety about families, separation from families, sudden school leave and stay at home can cause many mental disorders. In a Chinese survey, there are a couple of Coronavirus-19 studies on university students presenting serious stress reactions such as anxiety, depression and loneliness. The media reports that the rate of youth infection is increasing without symptoms would further increase university students' anxiety about the infection.

In addition to fear of viral infection, there are many problems to university students' academic performance related to Coronavirus-19, not only worry about epidemic viral infection from classmates but also the class type that they should adjust to. Because many university lectures changed to non-face-to-face classes, thus often, there is the failure to obtain good quality outcomes. This uncertainty is expected to lead to a widespread increase in anxiety among students.

At the Korea national level, it is recommended to prepare for 'the mental epidemic' of Coronavirus 19, which has caused national trauma and had a significant negative impact on the mental health of not only confirmed and bereaved families but also individual citizens. However, university students' anxiety about Coronavirus-19 is not yet studied in South Korea despite large disruption by Coronavirus-19 in the universities.

Due to this, the purpose of this study was to provide basic information on Korean university students' anxiety about Coronavirus-19 epidemic and to suggest a better class type to reduce anxiety, for high-quality academic performance at universities, using presenting anxiety difference between face-to-face and non-face-to-face classes.

MATERIALS AND METHODS

Participants and procedure

This survey was conducted during Coronavirus-10 pandemic in South Korea from June 27 to June 30, 2020. It was conducted using 94 nursing college students in J. city, and who recently experienced face-to-face and also non-face-to-face classes from March 2 to June 27, 2020. Online questionnaires

were employed at the end of the final examination on June 27. The 94 identical study participants were asked to fill the questionnaires 2 times (1 for a face-to-face class, 1 for non-face-to-face class). They were asked to imagine that they were still in the middle of face to face and also non-face to face classes and fill the questionnaires just like taking face-to-face and non-face-to-face class final examinations at the end of the semester. Identical study subjects were designed to remove individual variants of anxiety.

The International Self-Rating Anxiety Scale and Statistical Analysis

The anxiety level was measured using the 'The State-Trait Anxiety Inventory (Spielberger, 1975, Korean version)' online. The State-Trait Anxiety Inventory is based on a 4-point Likert scale and consists of 40 questions on a self-report basis. The STAI tests two different types of anxiety: state anxiety and trait anxiety. For this study, the State Anxiety Inventory composed of 20 items and scores ranging from 20 to 80 were used. More scores mean more anxiety. The State Anxiety (S-Anxiety) was to check excitement, tension, discomfort, etc. of the autonomic nervous system induced by many situations seemed as dangerous. And this type of anxiety means more about how a person feels in the time of perceived threats and it is considered temporary. Anxiety scores above 40 were defined as high anxiety group in this study.

SPSS WIN 20 was used for statistical analysis such as Chi-squared, t-test and regression test. Significance result was $p < 0.05$.

RESULTS

General characteristics of respondents

The general characteristics of the identical respondents in terms of gender, age, motivation to study, class type preference, residence and religion are as shown in Table 1. 85.1% were female students and 42.6% were aged 21 years, 92.6% had the voluntary motivation to study nursing, 51.1% preferred face-to-face class and 71.3% were non-religious as shown in below Table 1.

Table 1: General characteristics of identical respondents

Characteristics		Face-to-face	Non-face-to-face
		N=94	N=94
Gender	Male	13(13.8%)	13(13.8%)
	Female	80(85.1%)	80(85.1%)
Age(yr.)	20	12(12.8%)	12(12.8%)
	21	40(42.6%)	40(42.6%)
	22	18(19.1%)	18(19.1%)
	23	4(4.30%)	4(4.30%)

Table 1: (Continued)

Motivation to study nursing	Voluntary	87(92.6)	87(92.6)
	Non-voluntary	6(6.40)	6(6.40)
Class type preference	Face-to-face	48(51.1)	48(51.1)
	Non-face-to-face	45(47.9)	45(47.9)
Residence	Home	63(67.0%)	63(67.0%)
	Out of Home	30(31.9)%	30(31.9)%
Religion	Religious	26(27.7%)	26(27.7%)
	Non-Religious	67(71.3%)	67(71.3%)

*Missing case eliminated

Significance result of the mean value of anxiety by the face-to-face and non-face-to-face groups

The anxiety of the face-to-face group was 1.41 times higher than of non-face-to-face group, showing statistically significant difference specified in Table 2 and Figure 1.

Table 2: The significant difference in the mean value of anxiety with regards to group

Group	N	Mean±SD	t	P
Face-to-face	94	53.05±9.41	12.11	0.000
Non-face-to-face	94	37.47±7.63		

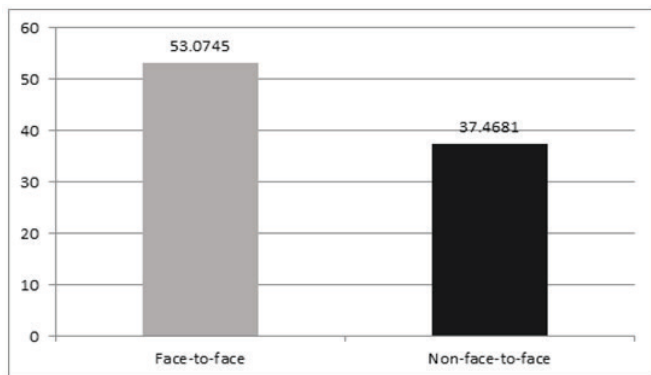


Figure 1: Significant difference in anxiety with regards to group

Significance result of anxiety by class preference in the face-to-face

The anxiety (58.50±5.50) of those who prefer non-face-to-face classes in the face-to-face group was 1.22 times higher than that of those who prefer face-to-face classes (47.76±9.14), indicating that anxiety varies depending on the preferred type of lecture (t=6.92, p=0.000). Meanwhile, there was no significant difference between the 2 groups in the non-face-to-face in Table 3 and Figure 2.

Table 3: Significant differences in anxiety with regards to class preference in the face-to-face group

Group	Class type preference	N	t-test		
			Mean±SD	T	p
Face-to-face	Non-face-to-face	48	58.50±5.50	6.92	0.000
	Face-to-face	45	47.76±9.14		
Non-face-to-face	Non-face-to-face	48	37.04±8.22	-0.41	0.684
	Face-to-face	45	37.69±6.93		

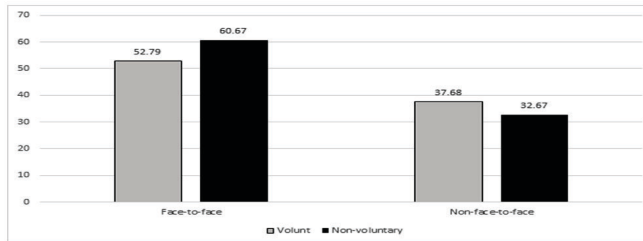


Figure 2: Significant differences in anxiety with regards to class preference in the face-to-face group.

Significance result of anxiety with regards to gender in the face-to-face group

The anxiety of female students (54.54±8.56) was 1.19 times higher than that of male students in the face-to-face group (45.69±9.67), indicating that the difference in anxiety between male and female students in the face-to-face was statistically significant (t=-3.40, p=0.000). However, there was no significant difference in the non-face-to-face group in Table 4 and Figure 3.

Table 4: Significant differences in anxiety with regards to gender in the face-to-face group

Group	Gender	N	t-test		
			Mean±SD	t	p
Face-to-face	Man	13	45.69±9.67	-3.40	0.000
	Women	80	54.54±8.56		
Non-face-to-face	Man	13	37.08±8.98	-0.14	0.904
	Women	80	37.40±7.42		

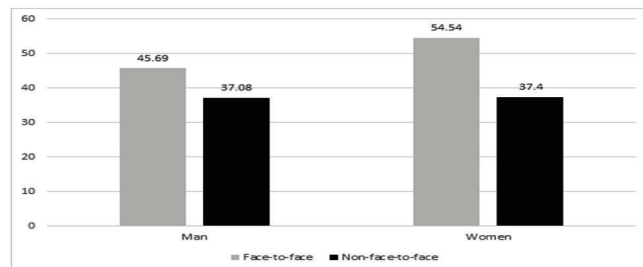


Figure 3: Significant differences in anxiety with regards to gender in the face-to-face group.

Significance result of anxiety with regards to high and low anxiety level

The high anxiety group of the face-to-face group with a score above 40 (54.66±7.215) had scored 1.86 times higher than the low anxiety group (29.33±4.131), indicating a statistically significant difference (t=8.487, p=0.000). 93.62% belonged to the high anxiety group in the face-to-face. The high anxiety group (44.43±3.021) of the non-face-to-face had scored 1.40 times higher than the low anxiety group (31.85±5.169), indicating a statistically significant difference (t=13.958, p=0.000) in Table 5 and Figure 4.

Table 5: A significant difference in anxiety with regards to high and lower anxiety levels

Group	Anxiety Level	N	t-test		
			Mean± SD	t	p
Face-to-face	High	88	54.66±7.215	8.487	0.000
	Low	6	29.33±4.131		
Non-face-to-face	High	42	44.43±3.021	13.958	0.000
	Low	52	31.85±5.169		

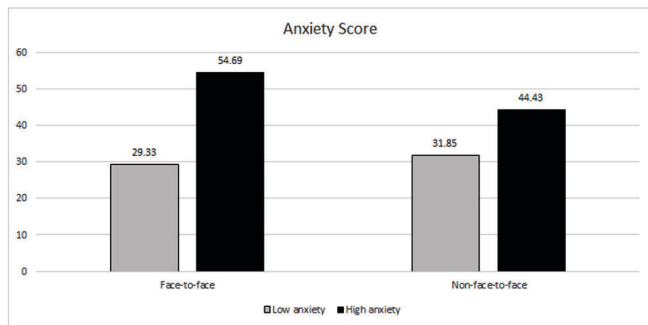


Figure 4: Significant differences in anxiety with regards to high and low level in both groups

Factors affecting anxiety in the face-to-face group

The factors that affected the anxiety of those in the face-to-face group are the preference for classes (β=-0.55, p<0.001) and gender (β=0.24, p<0.05). These factors explained anxiety (74.7%) in Table 6.

Table 6: Factors influencing anxiety in the face-to-face group

Variables	B	SE	β	t	p
Constant	56.18	5.01		11.21	0.000
Class preference	-9.99	1.51	-0.55	-6.61	0.000
Gender	6.42	2.18	0.24	2.95	0.004

F=47.67(p=.000) ad R²=0.747

DISCUSSION

This study was conducted to identify the differences in anxiety about the Coronavirus-19, depending on class type among college students who experienced both face-to-face and non-face-to-face classes during the Coronavirus-19 epidemic in South Korea. There are a few Coronavirus-19 related studies on university students; this study would, therefore, include previous studies on MERS and SARS for discussion.

In this study, there is a difference in anxiety with regards to class type only but not socio-demographic characteristics such as motivation to study subject, residence, age and religion. Chinese college students' residence with relatives or acquaintances was one of the anxiety factors followed by delayed academic activities due to Coronavirus-19 and economic strain.

In this study, the face-to-face group anxiety score was 1.41 times significantly higher than the non-face-to-face group. There were also significant differences with regards to class preference only in the face-to-face group. The non-face-to-face class preferred group and women had scores 1.22 and 1.19 times higher than other groups only in the face-to-face group and not in a non-face-to-face group. These results show overwhelming information on Coronavirus-19 in South Korea. The number of infected people and deaths are frequently provided through television and media daily in connection with the Corona Virus-19 epidemic. The Ministry of Education, Ministry of Health and Welfare and the Korea Centers for Disease Control and Prevention actively promote compliance with personal hygiene, such as hand hygiene and cough etiquette, to minimize the spread of the infection, and suggest non-face-to-face classes as a way of student group activities. It emphasizes active infection control activities and 2m social distance keeping practice by wearing masks and strengthening hand hygiene and personal hygiene, checking body temperature during face-to-face classes. These created more anxiety about infection in face-to-face classes than non-face-to-face classes. These results are similar to the study which showed that the higher the knowledge of MERS, the higher the attitude or the level of preventive action because the social distance is recognized as an important factor to prevent Coronavirus-19 infection. Thus, most students preferred non-face-to-face classes because they are more anxious about infection by the virus.

Students who stay at home because of social distance and online lectures develop the problem of mental stress and depression. It was argued that the loneliness of taking online classes alone could have a negative impact on education as compared to taking classes with friends in the same classroom. The face-to-face class students complained more about anxiety than non-face-to-face ones, which means Coronavirus-19 epidemic survival trauma overwhelmed other distress from non-face-to-face online studies even though

students no longer saw each other's expressions which also affected their psychological distress.

There are also significant differences with regards to gender only in the face-to-face group. This generally tends to appear in women at the risk of post-traumatic stress disorder, depression and anxiety increase when there is an epidemic. The survey on Chinese teenage girls aged 12 to 18 showed that girls had a high prevalence of depression, anxiety, depression and anxiety at the time of the outbreak of Coronavirus-19, while another Chinese study argued that there were no significant differences between female and male students. In MERS study, female students had a higher score in mental health areas such as anxiety and depression than male students, and in another study, women experienced serious anxiety in professional situations as compared to male students.

In this study, the high anxiety group had a score higher than the low group. 93.62% of the respondents had high anxiety in the face-to-face group only. It is well known that high anxiety affects poor academic performance, especially, in advanced and complicated courses such as university courses mentioned in the introduction section. Students with high anxiety showed good results in simple or mechanical tasks but low results in the complex and memory-demanding task. From this, it is suggested that high anxiety in the face-to-face group might have a significant impact on university academic performance. Factors affecting anxiety were class preference and gender in the face-to-face group only. The explanatory power of these variables is 74.7% which is predicted as high for the causation of anxiety. If the study was conducted right after finishing face-to-face lecture but not online, these results would be more significant in the face-to-face group.

The psychological problems during university years have recently become more serious due to Coronavirus-19. Because of this reason, this study suggests that universities should provide less dangerous class type such as non-face-to-face class, at least, during Coronavirus-19 epidemic.

CONCLUSION

This paper presents the anxiety reaction to Coronavirus-19 epidemic in South Korea, to find a better class type for enhancing academic performance in universities. The findings showed that there are significant differences in anxiety with regards to the face-to-face and non-face-to-face classes, but no differences with regards to motivation to study, type of residence, age and religion. The face-to-face seriously showed more anxiety than the non-face-to-face in all cases, which means they are worried about viral infection among classmates more than distress from class type changed to non-face-to-face from face-to-face. Another finding showed that the non-face-to-face preferred class and female students showed more anxiety than other groups only in the face-to-

face group. These results are more significant in the high anxiety group than the low anxiety group in the face-to-face group only.

In conclusion, this study indicated that non-face-to-face class had less anxiety than face-to-face class during Coronavirus-19 pandemic in South Korea, especially, those who preferred non-face-to-face and female students at the university. This is because they were worried about Coronavirus-19 spread among classmates than anything else. This study suggests that non-face-to-face class is a better choice class type to improve academic performance without worry and should be chosen in consideration of students' class type preference and gender.

Further studies are required with large numbers of students such as elementary and middle school students, to clarify the detailed causation of anxiety about Coronavirus-19 at schools.

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