

The Effect of Depression, Anxiety, and Stress on International Students' Adjustment to College Life in the Context of the COVID-19 Pandemics

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Abstract

This study examined the relationship between depression, anxiety, stress, and adaptation to college life of international students living in South Korea during the COVID-19 pandemic and the factors affecting the adaptation to college life. This study was carried out between December 3, 2021, to January 25, 2022, on international students living in South Korea. The questionnaires were composed of self-reported questionnaires, and the survey URL was sent as text messages to international students who understood the purpose and rationale of this study and consented to participate in the survey. The data were analyzed using SPSS WIN 22.0, and t-test, ANOVA, Pearson's Correlation Coefficient, and hierarchical regression were performed. As a result of the study, the average score of the study subjects was 8.44 points for depression, 8.28 points for anxiety, and 9.28 points for stress. Factors with significant differences in adaptation to college life according to general characteristics were living means and smoking. The relationship between the main variables, it was significant with depression ($r=-.785$, $p<.001$), anxiety ($r=-.593$, $p<.001$), and stress ($r=-.726$, $p<.001$). There was one negative correlation. It was found that the higher the depression, anxiety, and stress, the lower the college life adaptation. Lastly, depression ($\beta=-.666$, $p<.001$) was the factor affecting foreign students' adaptation to college life, and the explanatory power was 62%. Therefore, for international students to adapt to college life, it is necessary to establish an institutional strategy to detect depression, a negative psychological emotion, at an early stage and to systematically manage it. Also, it is necessary to find an intervention plan to relieve depression that can be applied in social isolation situations due to the spread of infectious diseases. Research confirming the intervention effect should be upgraded.

Keywords: COVID-19, Depression, Anxiety, Stress, International Students, Adjustment to College Life

1. INTRODUCTION

COVID-19 is a new infectious disease that was first reported in China's Hubei Province in December 2019, spreading to a worldwide pandemic. The first confirmed case of Covid-19 was confirmed in South Korea in January 2020, and the World Health Organization (WHO) declared it a "Pandemic" in March 2020. As the COVID-19 pandemic persisted for a long time, many people suffered psychologically and socially from various social problems [1].

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During this pandemic, the vulnerable group exposed to the risk of isolation are international college students who have to adapt to unfamiliar environments. All universities chose to switch to non-face-to-face classes using online lectures at the request of the Ministry of Education to prevent the social spread of the virus. In addition, social contact restrictions such as collective prohibition, social distancing, and self-isolation were further implemented. As a result, it was difficult for foreign students to adapt to college life and accomplish academic tasks [2]. If students do not properly adapt to college life, their academic abilities decrease and they experience maladjustment in social relationships [3].

Through several previous studies, it has been confirmed that isolation was closely related to depression, and it was found that isolation experience had a negative effect on depression [4, 5, 6]. In addition, depressed college students were reported more vulnerable to difficult academic tasks and were found to have a negative effect on academic potential [2, 7]. The level of health status or stress was also a factor influencing college life adaptation [8]. In order to adapt well to college life, it is necessary to understand the stress that can be experienced in college life and find the mediating factors that affect stress levels [9]. Foreign students face some common difficulties, however, various variables that affect their adaptation to college life, and act as significant factors to academic achievement include; language ability, interpersonal relationships, cultural stress, and social support rather than general characteristics such as gender, age, and economic status [10,11,12]. Similar to COVID-19, the spread of infectious diseases affects negative psychological emotions such as depression and anxiety [13]. International students require a considerable amount of time to adapt to the unfamiliar environment of foreign countries, and they resultantly experience a lot of stress, depression, and anxiety, especially with the COVID-19 control measures that were implemented. Moreover, since various variables derived from the spread of COVID-19 were believed to work together to have a significant effect on the adaptation of international students to college life, it was necessary to explore the factors affecting the adaptation of international students during the heightened period of the COVID-19 pandemic. Therefore, this study examined the relationship between depression, anxiety, stress, and adaptation to college life of international students living in Korea during the COVID-19 pandemic period and explored factors affecting adaptation to college life.

2. STUDY OBJECTIVES

This study aims to examine the relationship between depression, anxiety, stress, and the adaptation to college life of international students living in South Korea during the COVID-19 pandemic period, and explore the factors affecting the adaptation to college life.

- 1) Identify the general characteristics, depression, anxiety, stress, and degree of adaptation to college life of the study subjects.
- 2) Identifying the difference in adaptation to college life according to the general characteristics of the study subjects.
- 3) Depression and anxiety in the study subjects. The relationship between stress and adaptation to college life was identified.
- 4) Identifying the factors that affected the adaptation to college life.

3. METHODOLOGY

3.1 Research Design

This study was a descriptive survey study to explore the effects of depression, anxiety, and stress on adaptation to college life of international students living in South Korea during the COVID-19 pandemic period.

3.2 Data Collection

This study was conducted from December 3, 2021, to January 25, 2022, among international students living in South Korea. The questionnaire was composed of self-reported questionnaires, and the study URL was sent as text messages to international students who understood the purpose of this study and agreed to the survey. After receiving the text message, the international students read the explanation and agreed to voluntarily participate in the survey.

The number of subjects in the study was calculated using the G*power program 3.1.9.4 based on Cohen's power analysis. A significance level (α) of 0.05, power ($1 - \beta$) 0.85 was applied, and the median effect size (r).15, 148 people were appropriate but 150 people who submitted responses were analyzed.

3.3 Measurements

1) DASS 21 (Depression, Anxiety, and Stress scale)

To measure the subject's depression, anxiety, and stress, DASS-21 was used, which shortened the Depression, Anxiety, and Stress Scales (DASS) developed by Lovibond and Lovibond (1995) [14]. The reliability of the depression item was Cronbach's $\alpha = 0.929$, the reliability of the Anxiety scale was Cronbach's $\alpha = 0.903$, and the reliability of the stress scale was Cronbach's $\alpha = 0.900$.

2) College life adaptation

Lee (1999) [15] revised and supplemented the student adaptation to the College Questionnaire (SACQ) produced by Baker and Siryk (1989) [16] to use a tool consisting of a 5-point scale of 25 questions through reliability and factor analysis, and the reliability in this study was Cronbach's $\alpha = 0.711$.

4. STATISTICAL ANALYSIS

The collected data were analyzed using the statistical package SPSS WIN 22.0. The general characteristics, depression, anxiety, stress, and college life adaptation of the study subjects were analyzed by descriptive statistics, and t-test, ANOVA, and Pearson's correlation effects were analyzed.

5. RESULTS

5.1 General Characteristics and Independent Variables of Study Subjects

The general characteristics of this study were 82 women (54.7%) and 68 men (45.3%), with 60 people (40%) aged 18-25 years, 84 people (56%) aged 26-35, and 6 people (4%) aged 35 or older. In terms of marital status, 126 (84%) were unmarried and 24 (16%) were married, 81 (54%) reported the duration of stay in South Korea as 0-24 months and 69 (46%) reported duration of stay in South Korea as 25 months or more. As for the type of residence, 88 students (58.7%) were living in university dormitories and 62 (41.3%) were living in studio apartments, and for the Korean language proficiency level, 51 (34%) were beginners (34%) and 99 (66%) were intermediate or higher. The study subjects' majors were 47 students (31.3%) in the humanities and social sciences, 63 students (42%) in engineering and health sciences, and 40 others (26.7%). Those who received the living expenses support were 119 people (79.3%) and 31 people (20.7%) who did not receive the living expenses support, and for physical exercises, 78 people (52%) reported "Once a week" and 72 people (48%) reported doing it every day. As for the presence or absence of smoking, 139 were non-smokers (92.7%) and 11 were smokers (7.3%).

Table 1. General Characteristics and Independent Variables of Study Subjects

Variables	categories	N (%) or Mean \pm SD
Gender	Male	68(45.3)
	female	82(54.7)
Age (Years)	18-25	60(40)3.15 \pm 0.56
	26-35	84(56)3.23 \pm 0.67
	35+	6(4) 3.16 \pm 0.80
Marital status	Married	24(16)
	Unmarried	126(84)
Duration of stay in South Korea(months)	1-2 years	81(54) 3.23 \pm 0.69
	2 years+	69(46)3.15 \pm 0.56
Residence type	University Dormitory	88(58.7)
	Single room	62(41.3)
Level of Korean Language	beginner	51(34)
	Intermediate+	99(66)
Major	Healthcare & Engineering	63(42)
	Humanities and social sciences	47(31.3)
	others	40(26.7)
Living means	I get the allowance	119(79.3)
	I do not get the allowance	31(20.7)
Physical exercises	everyday	72(48)
	Once a week	78(52)
Smoking habit	Yes	11(7.3)
	No	139(92.7)
DASS-Depression		8.44 (\pm 6.09)
DASS-Anxiety		8.28 (\pm 5.96)
DASS-Stress		9.28(\pm 5.87)
College Life Adaptation		3.19 (\pm 0.63)

5.2 Differences in Adaptation to College Life according to General Characteristics

Independent sample t-test and one-way ANOVA were performed to verify whether there is a significant difference in college life adaptability according to general characteristics. As a result of the analysis, college life adjustment showed a significant difference in living expenses support ($t=1.99$, $p<0.05$), and “receiving living expenses support” ($M=3.24$) and “not receiving living expenses support” ($M=2.99$) appeared to be higher. Also, college life adaptation showed a significant difference in smoking ($t=-2.61$, $p<0.05$), and non-smokers ($M=3.23$) were higher than smokers ($M=2.72$). On the other hand, there was no significant difference in college life adaptability according to gender, age, marital status, period of stay in Korea, type of residence, Korean language proficiency level, major, and physical exercises.

5.3 Correlation between Depression, Anxiety, Stress and College Life Adaptation

The study subjects' adaptation to college life was depression ($r=-.785$, $p<.001$), anxiety ($r=-.593$, $p<.001$), stress ($r=-.726$, $p<.001$), there was a significant negative correlation. The higher the depression, anxiety, and stress, the lower the adaptation to college life.

Table 2. Differences in Adaptation to College Life according to the General Characteristics of the Subjects (n=150)

Variables	categories	N (%)	Mean ± SD	t or F	p
Gender	Male	68(45.3)	3.20±0.08	0.16	0.87
	female	82(54.7)	3.18±0.06		
Age (Years)	18-25	60(40)	3.15±0.56	0.28	0.75
	26-35	84(56)	3.23±0.67		
	35+	6(4)	3.16±0.80		
Marital status	Married	24 (16)	3.28±0.64	0.75	0.45
	Unmarried	126(84)	3.18±0.63		
Duration of stay in South Korea(months)	1-2 years	81(54)	3.23±0.69	0.81	0.41
	2 years+	69(46)	3.15±0.56		
Residence type	University Dormitory	88(58.7)	3.14±0.60	-1.09	0.27
	Single room	62(41.3)	3.26±0.67		
Level of Korean Language	beginner	51(34)	3.31±0.63	1.58	0.11
	Intermediate+	99(66)	3.18±0.63		
Major	Healthcare & Engineering	63(42)	3.29±0.64	1.39	0.25
	Humanities and social sciences	47(31.3)	3.11±0.60		
	others	40(26.7)	3.13±0.65		
Living means	I get the allowance	119(79.3)	3.24±0.61	1.99*	0.04
	I do not get the allowance	31(20.7)	2.99±0.68		
Physical exercises	everyday	72(48)	3.29±0.63	1.88	0.06
	Once a week	78(52)	3.10 ±0.62		
Smoking habit	Yes	11(7.3)	2.72±0.79	-2.61*	0.01
	No	139(92.7)	3.23±0.61		

5.4 Factors Influencing the Study Subjects' College Life Adaptation

As a result of reviewing the multi-collinearity of the study variables before regression analysis, the tolerance limit was 0.1 or more at .16~.98, and the variance inflation factor (VIF) was 1.04~6.15, which was less than the reference value of 10, indicating that there was no problem with multi-collinearity. Durbin-Watson was 2.094, which was close to 2, confirming the independence of the adjacent error term. In the first stage, support for living expenses and smoking, which showed a significant difference in college life adaptation among general characteristics, were introduced as independent variables. The regression equation of Model 1 was statistically significant ($F=4.985, p<0.001$). The adaptation to college life was explained by 5%. The suitability

of the two-stage model controlled by general characteristics was also statistically significant ($F=49.742$, $p<0.001$), and the explanatory power increased to 62%. Factors influencing college life adaptation are depression ($\beta =-.666$, $p<0.001$) has been identified.

Table 3. Correlation between College Life Adaptation and DASS-21 (Depression, Anxiety and Stress)

	DASS- Depression	DASS- Anxiety	DASS- Stress	College Life Adaptation
DASS- Depression	1			
DASS- Anxiety	.783 ($P<.001$)	1		
DASS- Stress	.894 ($P<.001$)	.822 ($P<.001$)	1	
College Life Adaptation	-.785 ($P<.001$)	-.593 ($P<.001$)	-.726 ($P<.001$)	1

Table 4. Factors Influencing the Study Subject's College Life adaptation

Model	Model 1					Model 2				
	B	SE	β	t	p	B	SE	β	t	p
(Constant)	3.057	.114		16.762	<.001	3.791	.089		42.082	<.001
support for living expenses (ref: No)										
Yes	.220	.126	.140	1.748	.082	.122	.081	.078	1.510	1.33
Smoking (ref: No)										
Yes	-.474	.195	-.195	-2.423	.017	-.145	.126	-.059	-1.150	.252
DASS- Depression						-.467	.082	-.666	-5.708	<.001
DASS- Anxiety						.071	.068	.095	1.037	.302
DASS-Stress						-.148	.095	-.195	-1.561	.121
R ²	.064					.633				
Adjusted R ²	.051					.621				
F (p)	4.985(.008)					49.742(<.001)				

6. DISCUSSION

This study tried to explore the factors affecting college life adaptation by examining the relationship between depression, anxiety, stress, and college life adaptation of international students residing in South Korea during the COVID-19 period. As a result of the study, the average score of the study subjects was 8.44 points for depression, 8.28 points for anxiety, and 9.28 points for stress. Compared with the study of female college students [17], the depression level was low, on the other hand, the anxiety level was high. And compared to a study of nursing students [18], depression and anxiety were high, and stress was low by looking at the previous studies on the mental health of domestic college students, we can see that the number of cases experiencing depressive symptoms was increasing [19, 20, 21]. In a study of new college students [22], the anxiety tendency was higher than the depression tendency. The results were similar, but the stress level was relatively high. This was similar to the results of Choi and Baek's study [23], which showed that depression and anxiety levels differ depending on the country of origin or period of study; and that the shorter the study period, the higher the level

of anxiety. It is believed that the unfamiliar environmental influences and the social isolation experienced by the spread of infectious diseases act simultaneously on foreign students, increasing anxiety. Self-isolation and social distancing practiced as the COVID-19 situation continued had a direct impact on psychological and emotional health and appeared to induce negative psychological emotions such as depression and anxiety [1, 13]. University students are the vulnerable group exposed to the risk of isolation during the pandemic. International students face various difficulties, such as social isolation, language barriers, and cultural adaptation due to the spread of infectious diseases, as well as academic tasks to be accomplished. High levels of depression, anxiety, and stress that may accompany this have a negative impact on college life adjustment [18]. System support and systematic management of high-risk groups by checking the degree of depression, anxiety, and stress of college students not only in the early stages of admission but also on a regular basis are thought to be necessary.

In the difference in adaptation to college life according to general characteristics, the students receiving living expenses support had a significantly higher adjustment to college life than the students who did not receive living expenses support. In a previous study of international students [24], it was found that students who could afford it or had a low financial burden through the scholarship system did well in adjusting to university life, which is consistent with the results of this study. The scholarship systems for international students implemented by most universities are determined by their Korean proficiency and grades. Therefore, it is considered that institutional support is needed so that foreign students can receive many benefits by providing various opportunities to improve Korean language skills that can be conducted non-face-to-face and by expanding the scholarship system.

Non-smokers had a significantly higher college life adjustment than smokers. A study on the health status of international students showed that the smoking rate of international students was lower than that of Korean students and they had relatively good health habits [25]. Smoking motive and smoking behavior were significantly correlated with stress [26]. Smoking and depressive symptoms in a previous study on the relationship with depression [27] showed that there was a significant difference in the relationship with depressive symptoms in the group that smoked. Therefore, not only physical health but also mental health management is very important for adaptation to university life, so we are operating a health promotion program for foreign students to check the level of depression, anxiety, and stress so that they can have correct health habits as well as early diagnosis as well as prevention. It is presumed that something will be needed.

As a result of analyzing the correlation between depression, anxiety, and stress and college life adaptability, the correlation between depression, anxiety, and stress was positively correlated. Also, college life adaptation had a negative correlation with depression, anxiety, and stress, which was consistent with the results of several previous studies [8, 28] targeting general college students. Policy support for mental health management is urgently needed in order for international students, the most vulnerable group exposed to the risk of isolation due to the spread of infectious diseases, to adjust to adapt to college life well. As shown in the research results, research to identify the causative factors and early diagnosis of depression, anxiety, and stress along with economic support should be systematically carried out, and ultimately, it is necessary to seek appropriate solutions together.

Depression was the factor affecting international students' adjustment to college life, and the explanatory power was 62%. A previous study [2] of college students under the COVID-19 situation also found that depression experienced by college students had a negative effect on the level of academic participation. In a study of college freshmen [22], stress was found to be the most influential factor in college life adaptation, which was different from this study. However, depression is highly correlated with stress¹⁾ and the same results were also found in this study. Depression is also affected by socio-demographic factors or various socio-

cultural risk factors. Through the results of previous studies [8, 22, 28, 29], it was found that negative psychological emotions such as depression have a negative effect on college life adaptation. Accordingly, it is necessary to provide programs that can improve international students' adaptation to university life. In particular, for international students, the level of depression, anxiety, and stress, which are negative psychological emotions to predict whether international students will be maladapted to college life from the early stage of admission to college, are identified to detect depression early, and regular tests are conducted to prevent the occurrence of high-risk groups. More systematic management is required. In addition, it is necessary to seek interventions to relieve depression that can be applied even in unwanted social isolation situations due to the spread of infectious diseases, and research to confirm the effects of interventions should be continued.

7. CONCLUSION

This study explored the factors affecting college life adaptation by examining the relationship between depression, anxiety, stress, and college life adaptation of international students residing in South Korea during the COVID-19 pandemic. The study subjects' college life adaptation had a significant negative correlation with depression, anxiety, and stress. Depression was found to have a significant effect on the adjustment to the college life of foreign students, confirming that it is a factor that can increase the college life adjustment of foreign students. Therefore, in order for international students to adapt to university life, it is necessary to establish an institutional strategy to detect depression, a negative psychological emotion at an early stage and to systematically manage it. Accordingly, policy support at each university and national level are required. Based on the results of this study, we would like to make the following suggestions. Firstly, this study was conducted with some college students, and there is a limitation in generalizing the research results. Therefore, by expanding the target audience in the future, repeated research on factors affecting international students' adaptation to college life is suggested. Secondly, follow-up research is suggested to develop an intervention program to increase the college life adaptation of international students and to verify the effectiveness.

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