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A study on Factors Influencing COVID-19 on depression and anxiety in university students

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코로나-19가 대학생의 우울과 불안에 미치는 영향 요인 연구

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Abstract In this study, the depression and anxiety of university students in the COVID-19 situation were identified, and the effects on depression and anxiety were indicated. Subjects were chosen randomly, and for the method a step selection multiple regression analysis was used. As a result of checking the factors affecting the subjects' general characteristics, stress level, preventive rule compliance level, and daily vitality level on depression and anxiety, the factors that had significant influence on depression were CPDI(β=.230, p=.000), and K-ANX(β=.472, p=.000). Other factors such as CPDI(β=.276, p=.000), EDAS(β=-.127, p=.019) and K-DEP(β=.482, p=.000) were analyzed to have significant effects on anxiety. Therefore, the results of this study are thought to be meaningful as basic data that can be used to establish educational and counseling activities that help university students adjust to society and academically in the COVID-19 situation.

Key Words : Convergence, COVID-19, Depression, Anxiety, Nursing student

요 약 본 연구에서는 코로나-19 상황에서 대학생들의 우울과 불안정도를 확인하고 우울과 불안에 미치는 영향을 파악하고자 하였으며, 임의표출로 대상자를 선정하였고, 자료분석은 단계 선택법 다중회귀분석을 이용하였다. 대상자의 일반적 특성과 스트레스 정도, 예방수칙 준수수준, 일상 활동 수준이 우울과 불안에 미치는 요인을 확인한 결과, 우울에 유의한 영향을 미치는 요인으로는 스트레스, 불안이, 불안에 유의한 영향을 미치는 요인으로는 스트레스, 일상 활동수준, 우울이 유의한 영향을 미치는 것으로 나타났다. 따라서 본 연구의 결과는 코로나-19 상황에서 대학생들이 사회생활 및 학교생활에 적응하는데 도움이 되는 교육 및 상담 방안을 수립하는데 활용될 수 있는 기초자료로 의의가 있을 것으로 사료된다.

주제어 : 융합, 코로나-19, 우울, 불안, 간호대학생

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1. Introduction

1.1 Need for research

With COVID-19, the world is emphasizing the precautions of social distancing and as social distancing becomes commonplace, there are increased cases of complaining of anxiety, loneliness and depression[1]. The National Center for Mental Health and the National Trauma Center[2,3] classified corona depression in relation to the current spread of COVID-19 into three categories: anxiety about corona infection, anxiety about economic damage, and depression caused by the indiscriminate spread of information.

University students are a period of active social interaction as they go through a life-changing process of demographic characteristics and university life. University students are more vulnerable to depression and anxiety due to stress such as academic adjustment, social self-image establishment, financial problems, decision-making problems, and social network establishment. In addition, it was reported that university students experienced about three times higher levels of depression and anxiety compared to the general population[4]. In the case of nursing students, 41% experienced depression and 52.3% experienced anxiety, and 67% of nursing students who experienced depression also experienced anxiety[5,6].

University students are particularly vulnerable to loneliness and it is a common problem encountered by university students. Loneliness can cause problems which increases your chances of developing depression[7]. In particular, university students are experiencing increasing loneliness as social interaction becomes difficult in a situation where unprecedented remote classes are being conducted due to the spread of the COVID-19 virus. As a way to solve this problem, SNS using smart phones is the most used[8], the results of analysis of the relationship between loneliness and SNS addiction tendency[9] and between loneliness and university life adaptation were reported[10]. After the popularization of the Internet and smar tphones, YouTube, a recent topic, is also overused by university students, which has been shown to have a negative effect on their adaptation to university life [11].

In the era of 'Post Corona', the 4th industrial revolution based on '5G network' will accelerate [12], and universities are faced with the task of preparing for psychological relief measures for university students in the era of full-scale distance education. Looking at the preceding studies, the results of a survey on health conditions conducted by the Korea Institute for Health Promotion[11] for the general public in the corona situation suggests that 40.7% experience corona depression, and that corona depression may increase due to prolonged COVID-19. In particular, due to the recent Corona 19, as part of social distancing, university education has undergone a major change, and online classes were conducted under the guidelines of the Ministry of Education[13]. University students are experiencing depression and anxiety due to the change of non-face-to-face teaching methods and experiencing lifestyle changes[14].

In the case of the University of Nursing, face-to-face lectures were used as the main teaching method in consideration of the specificity of subjects related to practice. However, due to COVID-19, clinical practice as well as face-to-face classes have been replaced by online education[15].

Nursing students experience feelings of isolation, helplessness, and depression as social

interaction becomes difficult due to the implementation of social distancing in the COVID-19 situation[16]. It is reported that students are more vulnerable to depression and anxiety due to stress from the unique curriculum of nursing and non-face-to-face clinical practice[17].

The information provided from the literature above indicate that conversion of online classes to offline should be made to enhance the psychological and social well-being of students as well as improvement of the quality of class education. Hence, in this study, we intend to propose a plan to check the psychological state students experience and to prepare better emotional health for university students who are participating in the social distancing precautions due to COVID-19.

The COVID-19 pandemic acts as stress for many people and the severity of corona depression emerges at home and abroad. Guidelines on how to cope with stress to prevent depression are also being proposed.

1.2 Purpose of the research

The purpose of this study is to check the psychological state of nursing students in the Corona 19 situation and to analyze the effect on it.

2. Proposed Method

2.1 Research Design

This research is to confirm the psychological state of nursing students in the COVID-19 situation and to determine the effect on it.

2.2 Research subject

The subjects of this study were 3rd and 4th grade nursing students who understood the purpose of the study and participated in the practice, who agreed in writing to participate in the study. Subjects were randomly expressed and assigned, and the number of study samples was calculated using the G*Power3.1 Program. The minimum sample size of the regression analysis was calculated as effect size .90, power(1-β) .08, and significance level (α). 05. As a result, the number of subjects was calculated to be 150. In this study, 390 people who participated in the actual class and consented to the study participated in the study.

2.3 Research tools

2.3.1 General Characteristics

After reviewing the literature, general characteristics were constructed including depression and anxiety, and age and gender that showed significant results. However, grade is excluded from general characteristics as it is conducted for participants in clinical practice. In addition, as academic stress and corona prevention rules and activity level are used as separate tools, general characteristics are configured to respond only to age, gender, and religion.

2.3.2 COVID-19 Peritraumatic Distress Index (CPDI)

The COVID-19 CPDI was utilized to measure the level of stress caused by COVID-19. This scale is a 24-item self-report test developed to evaluate the overall level of psychological distress, including depression, anxiety, specific phobias, cognitive changes, avoidance and compulsive behaviors, somatic symptoms, and decrease in social functioning[17]. Each item is rated on a 5-point Likert scale, with a total score ranging from 0 to 100. The internal reliability of CPDI was found to be excellent(Cronbach's α=.93), and in this study, Cronbach's α=.95.

2.3.3 COVID-19 Preventive Behavior Scale (CPBS)

The COVID-19 CPBS was utilized to measure the level of epidemic-related preventive actions during the COVID-19 pandemic. CPBS was developed based on existing research exploring COVID-19-related behavioral changes and compliance with the National Centers for Disease Control and Prevention's National Code of Conduct for COVID-19 Prevention[17-19]. Each item consisted of two factors, social distancing and personal hygiene, which encompass the five key rules of personal quarantine, and 4 items for each factor, for a total of 8 items. Each item was rated on a 5-point Likert scale. The internal reliability of CPBS was found to be excellent(Cronbach's α=.88), and Cronbach's α=.88 in this study.

2.3.4 Engagement in Daily Activity Scale (EDAS)

EDAS was used to evaluate the level of vitality of daily activities. The EDAS consists of 5 items measuring daily activities, and each item was evaluated on a 5-point Likert scale. The internal reliability of EDAS was .77, and in this study, Cronbach's α=.79.

2.3.5 Korean Screening Assessment for Depressive Disorders (K-DEP)

To evaluate depressive symptoms, the K-DEP provided by the National Mental Health Center Mental Health R&D Project Team of the Ministry of Health and Welfare and the KU Mind Health Research Center at Korea University was used. This scale consists of a total of 12 items, and each item was evaluated on a 5-point Likert scale. In the validation study, K-DEP was found to be 'very good' with an accuracy of 94.6% in the ROCCurve analysis. In this study, Cronbach's α =.93.

2.3.6 Korean Screening Tool for Anxiety Disorders (K-ANX)

To evaluate the level of anxiety, K-ANX provided by the National Mental Health Center Mental Health R&D Project Team of the Ministry of Health and Welfare and the KU Mind Health Research Center at Korea University was used. This scale consists of a total of 10 items, and each item was evaluated on a 5-point Likert scale. The total score of this scale ranges from 0 to 40, and K-DEP showed 'very good' with an accuracy of 94.6% in the ROCC analysis in the validation study. The internal reliability of K-ANX was Cronbach's α=.96, which was found to be .93 in this study.

2.4 Research analysis

The collected data were analyzed using SPSS WIN 23.0.

1. For general characteristics of the subjects, frequency, percentage, mean, and standard deviation were calculated.
2. The relationship between general characteristics and depression and anxiety was analyzed using t-test and ANOVA.
3. The effect on depression and anxiety was identified through multiple regression analysis.

2.5 Ethical considerations of research

In this research survey, personal information (name, gender, etc.) was not entered, confidentiality and anonymity were guaranteed, and it was explained that the collected data would be used only for research purposes, and participants were allowed to participate in the survey voluntarily. In addition, participants were explained that the results are not related to any kind of evaluation and that they could withdraw their participation in the study at any time, and informed consent was obtained. The surveyed questionnaire was analyzed by giving unique number for each participant.

3. Results and Discussion

3.1 General characteristics and psychological state of the subject

Table 1 shows the general characteristics of subjects who participated in this study. By gender, male students accounted for 11.8% (n=46) and female students for 88.2%(n=344). The age group was divided if to 22 and younger with 69.2%(n=270), 23-24 with 13.3%(n=52) and over 25 years of 17.5%(n=68). Percentage of students with religion was 35.4%(n=138 people) and students who replied to be without religion was 64.6%(n=252).

Table 1. General characteristic

n=390

Characteristics	Categories	N(%)
Gender	Female	344(88.2)
	Male	46(11.8)
Age(yr.)	≤22	270(69.2)
	23~24	52(13.3)
	≥25	68(17.5)
Religion	yes	138(35.4)
	no	252(64.6)

The level of stress caused by COVID-19 was 17.23±15.95 out of 96 point. The level of stress caused by COVID-19 was 17.23±15.95 out of 96 points. The level of infectious disease related preventive behaviors of social distancing and personal hygiene during the COVID-19 epidemic resulted in 15.03±5.66. In addition, the level of daily activities was 12.48±2.89, the degree of depression was 7.25±8.84, and the anxiety was 7.62±9.21(Table 2).

The results of this study showed a different result from the other studies concluding depression at 8.15 and anxiety at 7.53 in the Korean psychological impact study in the COVID-19 situation by Park Yong-cheol et al[20] and others who used the same depression and anxiety tools. In the context of prolonged COVID-19, this result is thought to be that the number of new confirmed cases was on the decline during the period and students recognized the national quarantine policy. As the COVID-19 pandemic continues for a long time with continuous social distancing, self-isolation being implemented, limited social activities and risk factors that can cause many new cases continue, the mental health of nursing students cannot be overlooked. is presumed to be. Therefore, it is necessary to maintain various activities such as social exchanges through online to alleviate psychological pain, considering that social exchanges may be limited in the long term and the psychological level of depression and anxiety may increase[21].

Table 2. Psychological state

n=390

Categories	minimum	maximum	M ±SD
CPDI*	0	96	17.23±15.95
CPBS**	0	24	15.03±5.66
EDAS***	5	20	12.48±2.89
KDEP****	0	48	7.25±8.84
KANX*****	0	47	7.62±9.21

*CPDI : COVID-19 Peritraumatic Distress Index
**CPBS : COVID-19 Preventive Behavior Scale
***EDAS : Korean Screening Assessment for Depressive Disorders
****KDEP : Korean Screening Assessment for Depressive Disorders
*****KANX : Korean Screening Tool for Anxiety Disorders

3.2 Effects of COVID-19 on Depression and Anxiety in Nursing Students

In the relationship between general characteristics and depression and anxiety, it was found that depression and anxiety increased with age, which was statistically significant. Gender and religion were not statistically significant(Table 3). It is thought that the older they are, the more they experienced depression and anxiety due to the difficulty in adapting to the non-face-to-face teaching method. I think it is necessary to carry out repeated studies in the future, taking further demographic characteristics into consideration.

Table 3. The relationship between general characteristics and depression and anxiety

n=390

Characteristics	Categories	KDEP	t/F(p)	KANX	t/F(p)
Gender	Male	8.13±11.71	.711 (.478)	6.93±10.27	-.543 (.587)
	Female	7.14±8.405		7.725±9.07	
Age(yr.)	≤22	6.44±8.15	3.993 (.019)	6.54±8.40	6.331 (.002)
	23~24	9.65±11.54		9.65±11.38	
	≥25	8.67±8.76		10.38±9.73	
Religion	yes	6.43±8.57	-1.363 (.174)	6.71±8.28	-1.458 (.146)
	no	7.71±8.97		5.13±9.66	

In order to identify the factors influencing depression and anxiety in the subjects' general characteristics, stress level, preventive rule compliance level, and daily vitality level were used as independent variables. Table 4, 5 shows the results of multiple regression analysis using step selection method with depression and anxiety as dependent variables.

In regression analysis, the scatter plot and normal probability graph of the residuals were checked to test whether the residuals were normally distributed, uniform variance, and linearity. In the model validation of the factors affecting depression, the residuals were close to a 45 degree straight line, and the distribution of the residuals was spread evenly around 0. Tolerance for multicollinearity test was .538-.897, and Variance Inflation Factor (VIF) was 1.115-1.859, so there was no problem of multicollinearity. The Durbin-Watson value was also 2.061, which was close to 2 without being biased towards 0 and 4, confirming that the regression model was suitable because there was no correlation between the residuals.

Factors significantly influencing depression include CPDI(β=.230, p=.000), and K-ANX(β =.472, p=.000). It was found that the higher the stress and anxiety, the higher the degree of depression.

Table 4. Effect on Depression

variable	β	t	p
CPDI*	.230	6.139	.000
K-ANX**	.472	7.324	.000

adjusted R2 : .610, F= 70.786, p<.05

*CPDI : COVID-19 Peritraumatic Distress Index
**K-ANX : Korean Screening Tool for Anxiety Disorders

In the model validation of the influencing factors on anxiety, it was close to a 45 degree straight line, and the residual distribution was spread evenly around 0.Tolerance for multicollinearity test was .490-.948, and Variance Inflation Factor (VIF) was 1.055-2.042, so there was no problem of multicollinearity. The Durbin-Watson value was also 2.056, not biased toward 0 and 4, and was close to 2, confirming that the regression model was suitable because there was no correlation between the residuals.

Factors significantly influencing anxiety depended on CPDI(β=.276, p=.000), EDAS(β =-.127, p=.019) and K-DEP(β=.482, p=.000). The higher the stress and depression, the higher the anxiety, and the higher the level of daily activity, the lower the anxiety.

Table 5. Effect on Anxiety

variable	β	t	p
CPDI*	-.127	-2.377	.019
EDAS**	.276	4.047	.000
K-DEP***	.482	7.132	.000

adjusted R2 : .578, F= 51.640, p<.05

*CPDI : COVID-19 Peritraumatic Distress Index
**EDAS : Korean Screening Assessment for Depressive Disorders
***K-DEP: Korean Screening Assessment for Depressive Disorders

The results of this study show that depression and anxiety are factors that significantly affect the psychological state of university students in the COVID-19 situation, and it is important to prepare alternatives for psychological relief such as online social interaction in a social distancing situation [22,23]. Similar to the results of this study, Lee Jong-man's study[12] also showed that university students' loneliness increased due to COVID-19, suggesting that the higher intensity of loneliness results as a higher risk factor for university life adaptation. It is considered that there is a need for measures to alleviate the psychological depression and anxiety of university students.

Also, based on the results that anxiety, depression, and stress had a significant effect, it is necessary to build a system that can manage the quality of education so that the learning stress of nursing students is not aggravated due to difficulties in accessing and utilizing online classes of theory and practice.

The COVID-19 pandemic acts as a stress for many people, and as the severity of corona depression and anxiety has emerged, both at home and abroad are guiding ways to cope with stress to prevent depression and anxiety.

In the study of Jongnam Baek[24], nursing students showed the lowest sense of interaction efficacy in real-time online classes. Therefore, a plan to prevent depression and anxiety caused by stress should be prepared by continuously improving the system so that nursing students can actively participate in online social interaction by attempting to graft technology in various fields. In addition, reflecting the research result that students who take classes passively have significantly greater anxiety than students actively taking online classes[16], it seems necessary to establish a stable infrastructure for real-time online content at the university and administrative support for content utilization.

Reflecting the research results that the higher the level of vitality of daily activities, the lower the anxiety level, outdoor activities should be recommended to reduce anxiety. However, in the current Corona situation, it is not possible to increase the level of vitality of outside activities due to the restraint of going out. Therefore, it is necessary to actively utilize online contents through online classes to promote activities and to form a rapport between professors and students to narrow the psychological distance. The reason that COVID-19 preventive behavior did not affect depression and anxiety is thought to be because it is being carried out as a guideline that must be followed to prevent infection in the current situation where the corona infection is spreading. In the future, it is expected that studies that reveal psychological characteristics through in-depth interviews or qualitative research approaches will be conducted.

Therefore, the results of this study are considered to be meaningful as basic data can be used to establish educational and counseling activities that help university students adapt to society and study in the COVID-19 situation.

4. Conclusion

In this study, depression and anxiety of university students during the COVID-19 pandemic was identified as well as investigation of its effect on depression and anxiety. The subjects were arbitrarily expressed, and the step selection method multiple regression analysis was used as the analysis method.

The results of the study confirmed the factors affecting depression and anxiety of subjects' general characteristics, stress level, precautionary rule compliance level, and daily vitality level.

Factors significantly affecting depression were found to be stress and anxiety. As a result of this study, the level of daily activity vitality, stress, depression, and anxiety in the COVID-19 situation appear to be factors that significantly affect the psychological state of university students. It is necessary to prepare a class plan that encourages students to participate actively, and coping plan for psychological relief of university students, preventing depression and anxiety among university students.

Based on the above research results, I would like to suggest the following.

First, we suggest a fact-finding study on what methods university students are using as a coping method to alleviate their psychological state due to the prolonged corona virus.

Second, we propose a study to verify the effectiveness of applying a method to overcome stress such as depression and anxiety in the Corona 19 situation.

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