The Effects of Friend Stress, Trait Anxiety, and Depressive Tendency on Hermit-Type Binge Eating Disorder Behavior: Mediating Effect of Emotional Clarity

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ABSTRACT

This study confirmed the effects of friend stress, trait anxiety and depression tendency on emotional clarity and hermit-type binge eating disorder behavior. In addition, it was confirmed whether the perception of emotional clarity had a mediating effect on the behavior of hermit-type binge eating disorder. Covariate structural analysis was conducted to determine the effects of friend stress, trait anxiety, and depressive tendencies on hermit type binge eating behavior. First, it was shown that friend stress, trait anxiety, and depression tend to have a significant effect on emotional clarity. In other words, friend stress had a significant effect on emotional clarity. Trait anxiety had a significant effect on emotional clarity. The tendency of depression had a significant effect on emotional clarity. Second, friend stress and trait anxiety were found to have a significant effect on hermit-type binge eating behavior. In other words, friend stress had a significant effect on hermit-type binge eating behavior. Trait anxiety had a significant effect on hermit eating behavior. On the other hand, depression tendency did not affect hermit eating behavior. Third, emotional clarity had no significant effect on hermit-type binge eating behavior. Therefore, no mediating effect was observed. This study is valuable in confirming how the stress of friends, trait anxiety, and depression tend to affect hermit -type binge eating behavior among college students. In addition, it is meaningful that the recognition of emotional clarity confirmed the mediating effect of hermit type binge eating behavior.

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INTRODUCTION

Eating disorder, known as one of the modern diseases, appeared due to the increase in the obese population due to the westernized diet, and the change in aesthetic standards favoring skinny body. It usually begins in adolescence, when you become interested in appearance, and peaks in your 20s.Binge eating is actually eating a large amount of food at once, and at this time, it is characterized by losing control of overeating, DSM-IV says. Loss of control over overeating means feeling that you can't stop eating or control the type or amount of food you eat. The eating disorder behavior is defined as eating more than most people eat within a given time (two hours) in a similar situation(APA, 1994). Heatherton & Baumeister(1991) hypothesized that eating disorder occurs in motivation to evade painful self-awareness, which can be seen as an explanation for eating disorder as a means of controlling emotion.

Binge eating behavior has been linked to decreased mental health as well as physical health. According to previous studies, binge eating behavior was associated with decreased physical health such as obesity, chronic muscle pain, and insomnia, as well as decreased mental health such as anxiety and depressive symptoms and poor quality of life. Risk factors for binge eating behavior include diet, overestimation of appearance, anxiety and depression, emotional eating, physical dissatisfaction, and self-esteem(Stice *et al*., 2002).

Among the risk factors described above, emotional eating is an action that increases food intake to alleviate negative emotions(Spoor *et al*., 2007), and is highly related to obesity and health problems(Frayn *et al*., 2017), and a number of prior studies It was also highly related to binge eating behavior. Goldschmidt *et al*(2008) suggested that maladaptive eating behavior such as emotional eating may be an early stage of adolescent binge eating disorder. The more maladaptive eating behaviors such as emotional eating, the greater the risk of binge eating disorder. In other previous studies, emotional eating was associated with high-calorie food intake, frequent binge eating, and symptoms of severe eating disorders. As such, a number of studies suggest that emotional eating is an important factor in understanding binge eating behavior.

On the other hand, when considering that emotional eating is an increased food intake behavior to alleviate negative emotions(Spoor *et al*., 2007), it is necessary to consider negative

emotions as a trigger for emotional eating. For example, vulnerability to depression, impaired emotional regulation, and negative emotion were related to emotional eating (Gibson, 2012), and emotional eating occurred as an adverse reaction to negative emotions including anger, fear, and anxiety. In addition, negative emotion is a variable that is highly related not only to emotional eating but also to binge eating behavior, and in many studies, negative emotion was one of the factors highly related to binge eating behavior. For example, binge eating behavior was a dysfunctional replacement method to resolve negative emotions, and a history of depression and low self-esteem were strong predictors of the onset of eating disorders. In particular, depression and inadequacy among negative emotions played an important role in the onset of binge eating behavior(Stice *et al*., 2002). According to a systematic review of the literature by Leehr *et al*(2015) negative emotions were the triggering factor of binge eating behavior in the binge eating disorder group. In addition, the binge eating behavior group had higher levels of anxiety and depression than the non-binge eating behavior group. Compared to the group who experienced both binge-eating behavior and negative emotion after severe dietary restriction, more severe binge-eating behavior and higher treatment dropout rates were observed.

While negative emotions can trigger binge-eating behavior directly, it can also increase the risk of binge-eating behavior by increasing the risk of emotional eating. In a study of the actual eating disorder clinical group, emotional eating mediated the relationship between negative emotions and binge eating behavior. In addition, high negative emotion was associated with emotional eating and binge eating behavior, and emotional eating predicted violent behavior(Stice *et al*., 2002). These preceding studies imply that negative emotions play a major role in the development of emotional eating behaviors into binge eating behaviors, and suggest the need to explore the role of negative emotions in the relationship between emotional eating and binge eating behaviors.

Meanwhile, emotional regulation is a variable that can influence the relationship between emotional eating and binge eating behavior(Vandewalle *et al*., 2016). Emotion regulation is a process people use to influence which emotions, when and how they experience and express them. Difficulty in emotional regulation is an individual characteristic factor that plays a major role in pathological eating behavior, and the level of emotional regulation difficulty was significantly higher in the emotional and pathological eating behavior groups. In addition, in previous studies, the relationship between emotional regulation strategy limitation, lack of emotional understanding and binge eating behavior, emotional non-acceptance, and target

behavioral difficulties and eating problems, which are sub-factors of emotional regulation difficulties. Difficulty in emotional regulation in binge eating behavior was a variable with greater explanatory power than gender, food restriction, weight, and overestimation of the body. In particular, limitation of emotion regulation strategy and lack of understanding of emotion, which are the sub-factors of emotional regulation difficulty, mainly explained binge eating behavior. Another sub-factor, impulse control difficulty, is a variable that is closely related to the mechanism of binge-eating behavior. Patients with binge-eating behavior have difficulty in controlling their eating urge and are unable to properly control their eating behavior. The criteria for the diagnosis of binge-eating disorder include a feeling of loss of ability to control eating behavior in addition to binge-eating behavior. Based on the results of these previous studies, this study confirmed the role of the emotional clarity factor as a risk factor for binge-eating behavior, and confirmed whether negative emotions influenced binge-eating behaviors by mediating emotional clarity.

In this study, we conducted a study focusing on the behavior of hermit-type binge eating disorder in which people binge alone by hiding in places where others do not see. A friend stress, trait anxiety, and depression variables were set as emotional variables and research was conducted. It also focused on whether emotional awareness was related to hermit eating behavior.

The purpose of this study was to investigate the emotional factors affecting the hermit-type binge eating behavior. To this end, we investigated whether friend stress, trait anxiety, and depression tend to affect hermit-eating behavior. In addition, it was intended to confirm the mediating effect of emotional clarity affecting hermit-type binge eating behavior. Therefore, we confirmed the direct effect of friend stress, trait anxiety, and depression on emotional clarity. Lastly, we tried to confirm the effect of emotional clarity on hermit eating behavior. These results were attempted to confirm the mediating effect of emotional clarity. For this research purpose, the following hypothesis was established(see Figure 1).

Hypothesis 1: Friend stress will negative affect emotional clarity.

Hypothesis 2: trait anxiety will negative affect emotional clarity.

Hypothesis 3: The tendency of depression will negative affect emotional clarity.

Hypothesis 4: Emotional clarity will positive affect hermit-type binge eating behavior.

Hypothesis 5: Friend stress will positive influence hermit-type binge eating behavior.

Hypothesis 6: trait anxiety will positive affect hermit-type binge eating behavior.

Hypothesis 7: The tendency of depression will positive affect hermit-type binge eating behavior.

Hypothesis 8: Emotional clarity mediated affect hermit-type binge eating behavior.
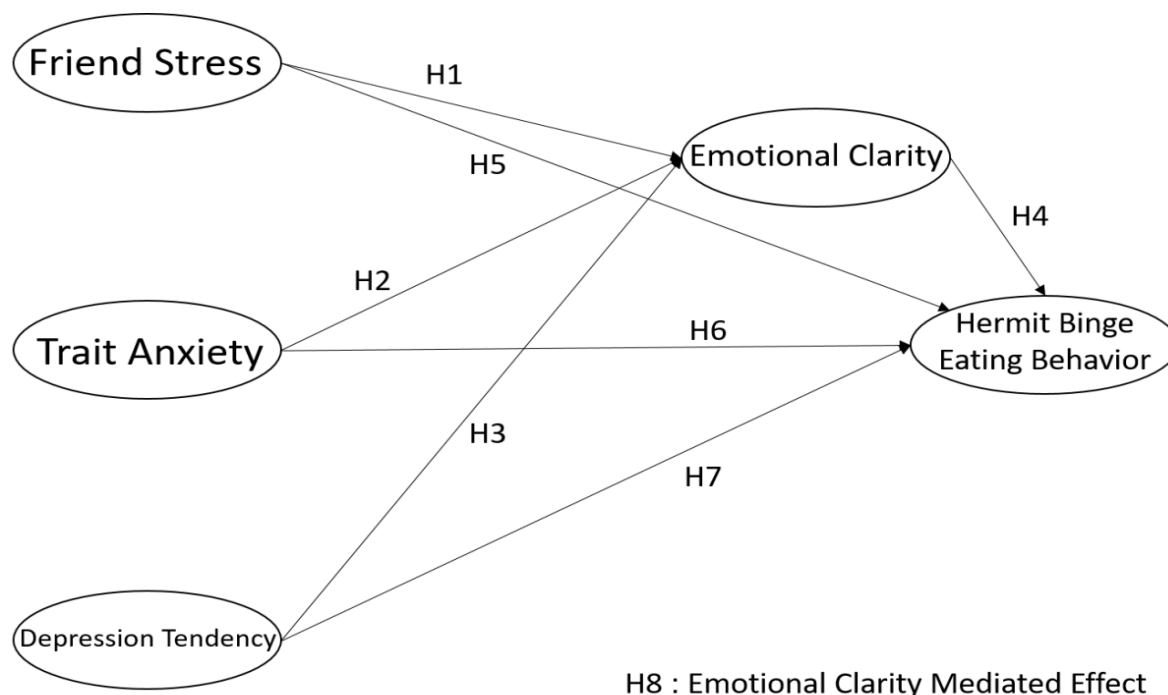

Figure 1:Hypothesis and Research model

METHOD

Subject

Participants were 360 students from B University and N University in Cheonan. There were 149 211 females (58.6%) and males (41.4%). The age distribution was from 18 to 25 years old(Mean=19.9 age). Participants were college students who reported experiencing eating disorder during their daily lives within the last three months.

Measurement Scales

Friend Stress Scale

The friend stress scale used in this study was the scale constructed by Jeon and Kim(1991). It consisted of extracting only 6 items to measure friend stress, and the items are as follows. I was bullied by my friends. I was rejected by my friends. I felt like my friend was ignoring me. I was rude by my friends. I couldn't make friends that fit my heart. It was produced on a Likert-type

5-point scale (1point = not at all. 5point = very so). In this study, as a result of confirming factor analysis of the friend stress scale, one item was deleted. As a result of reliability analysis, Cronbach'α = .888(see Table 1).

Trait Anxiety scale

The trait anxiety scale of this study was used by Bendig(1956). The Trait Anxiety Scale consists of 9 items, and the items are as follows. I am nervous. I am regretful and sad. I am embarrassed and do not know what to do.I am worried that there will be misfortune in the future. I am anxious. I am annoyed. I am nervous. I am extremely nervous. I am worried. I am excited and do not know what to do.It was produced on a Likert-type 4-point scale (1 point= not at all. 4point = very so). As a result of confirmatory factor analysis, 2 items were deleted. As a result of reliability analysis, Cronbach'α = .904(see Table 1).

Depression Scale

The depression scale used in this study was developed by Radloff(1997). This scale consists of 7 items, and the items are as follows. I thought my life was a failure. I felt fear. I felt lonely in the world alone. People seemed to be treating me cold. Suddenly a cry came out. I felt sad. People seemed to hate me. It was manufactured on a Likert-type 4-point scale (1 point = extremely thin (1 day or less). 4 points = almost all (5-7 days). As a result of reliability analysis, Cronbach'α = .888(see Table 1).

Emotional Clarity Scale

The emotional clarity scale used in this study was used by Salovey et al(1990). This scale consists of 5 items, and the items are as follows. am always confused about how I feel. I can't understand my feelings. Sometimes I can't tell what my feelings are. I almost always know exactly how I feel. My beliefs and opinions always change depending on how I feel. It was produced on a Likert-type 5-point scale (1 point = not at all, 5 points = always). All of these emotion recognition clarity scales consist of inverse questions. Therefore, in actual analysis, it was analyzed by reverse coding.As a result of confirmatory factor analysis, one item was deleted. As a result of reliability analysis, Cronbach'α = .880(see Table 1).

Hermit Eating Behavior Scale

As the hermit-type binge eating scale used in this study, the scale produced by Garner & Olmsted (1984) was revised by Garner. The binge eating disorder behavior scale consists of three items, which are as follows: I eat moderately in front of others, but overeat after they go. I have the idea of vomiting to lose weight. I secretly eat or drink. It was produced on a Likert-

type 5-point scale (1 point = not at all, 5 points = always). As a result of reliability analysis, Cronbach'α =. 782(see Table 1).

Table 1: Scale reliability analysis results

Measurement Scales	Cronbach'α
Scale	.888
Trait Anxiety scale	.904
Depression Scale	.888
Emotional Clarity Scale	.880
Hermit Eating Behavior Scale	.782

Data analysis

In this study, SPSS / PC + 23.0 Version was used for data analysis. Covariate structural analysis was conducted to determine the effects of friend stress, trait anxiety, and depressive tendencies on hermit type binge eating behavior. Exploratory and confirmatoryfactor analysis were performed to confirm the validity of the scales, and the internal consistency test of Cronbach was performed to confirm the reliability. A frequency analysis was conducted to analyze the characteristics of the study participants.

RESULTS

Analysis of the validity of the scale

Exploratory factor analysis was conducted to analyze the validity of the five scales used in this study (Friend Stress Scale, Trait Anxiety Scale, Depression Scale, Emotional Clarity Scale, Hermit Eating Behavior Scale). The results are shown in Table 2. As shown in Table 2, all the scales used in this study were confirmed to have high validity.

Table 2: Results of analysis of validity of the scale

Scales	Factor				
	Factor1	Factor2	Factor3	Factor4	Factor5

Trait Anxiety7	.782			
Trait Anxiety8	.732			
Trait Anxiety3	.725			
Trait Anxiety5	.716			
Trait Anxiety4	.671			
Trait Anxiety1	.669			
Trait Anxiety2	.660			
Trait Anxiety6	.650			
Depression3		.767		
Depression4		.720		
Depression2		.692		
Depression6		.674		
Depression1		.673		
Depression5		.610		
Friend Stress1			.838	
Friend Stress3			.830	
Friend Stress2			.826	
Friend Stress5			.760	
Friend Stress4			.642	
Emotional Clarity4				.875
Emotional Clarity3				.872
Emotional Clarity2				.822
Emotional Clarity1				.819
Hermit Eating Behavior2				.810
Hermit Eating Behavior3				.799
Hermit Eating Behavior1				.770

Hypothesis Testing

This study was conducted, χ^2 test was performed to confirm the suitability of the study model. To verify the research hypothesis, Covariate structure analysis was performed. To find out the fit of the research model, GFI, AGFI, RMR, and RMSEA were used as absolute fit indices, and NFI, TLI and CFI were used as incremental fit indices. Based on the above acceptance index, this study analyzed the causal relationship of emotional factors (stress, anxiety, depression) on hermit-type binge eating behavior. In addition, the mediating effect of the emotional recognition clarity factor was confirmed. Table 3 shows the analysis results for the research model. As shown in Table 3, since the fitness index value of the initial model did not meet the acceptance criteria, the final research model was derived by modifying the model.

Table 3: Comparison of the InitialResearch Model and the Final Research Model

Fit Indices	RMR	RMSEA	AGFI	GFI	NFI	TLI	CFI
InitialResearch model	.040	.077	.799.	835	.841	.871.	885

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Finalized Researchmodel	.034	.048	.882.	907	.910	.949.	956	nitial
Acceptance level	>.05	<0.8	>90	>.90	>.90	>90	>.90	Research mo

del: χ^2=900.095, df=289, $p<.001$

Finalized Researchmodel: χ^2=473.155, df=258, $p<.001$

As a result of the verification of hypothesis 1 (friend stress will affect emotional clarity), it was found that friend stress has a significant effect on emotional clarity (t=-4.388, p<.001). However, it was found that the higher the friend stress, the lower the perception of emotional clarity. Therefore, it was confirmed that for university students, friend stress negatively affects emotional perception clarity (see Table 4 and Figure 2). In conclusion, Hypothesis 1 was supported.

As a result of the verification of Hypothesis 2 (trait anxiety will affect emotional clarity), it was found that the trait anxiety of university students had a significant effect on emotional perception clarity (t=2.801, p<.01). However, it was found that the higher the level of trait anxiety among university students, the lower the emotional perception clarity. Therefore, the trait anxiety that university students have is interpreted as having a negative effect on emotional clarity (see Table 4 and Figure 2). Based on these results, Hypothesis 2 was supported.

As a result of the verification of hypothesis 3 (depression tendency will affect emotional clarity), it was found that the level of depression in university students had a significant effect on emotional perception clarity (t=-2.462, p<.05). However, it was found that the higher the level of depression among university students, the lower the emotional perception clarity. Therefore, it is interpreted that the level of depression among university students has a negative effect on emotional clarity. Table 4 shows the hypothesis verification. In other words, Hypothesis 3 was supported.

As a result of the verification of hypothesis 4 (emotional clarity will affect the hermit-type binge eating behavior), the emotional clarity of university students did not significantly affect the hermit binge eating behavior (t=.408, p>.05). Therefore, it is interpreted that the clear recognition of their emotions for university students is not related to the hermit binge eating behavior. Based on these results, Hypothesis 4 was rejected.

As a result of the verification of Hypothesis 5 (friend stress will affect the hermit-type binge eating behavior), it was found that friend stress had a significant effect on the reclusive binge

eating behavior (t=5.619, p<.001). In other words, the higher the friend stress, the higher the frequency of hermit binge eating behavior. Therefore, it was confirmed that for university students, friend stress had a positive effect on hermit binge eating behavior. In conclusion, it can be said that for university students, the factor of friend stress is highly related to binge eating behavior that is hidden from others. That is, hypothesis 5 was supported.

As a result of the verification of Hypothesis 6 (traditional anxiety will affect reclusive binge eating behavior), it was found that the trait anxiety of university students had a significant effect on the hermit-type binge eating behavior (t=2.776, p<.01). Therefore, it can be said that the higher the trait anxiety that university students have, the higher the frequency of hermit binge eating behavior. These results are interpreted as having a positive relationship between the level of trait anxiety and the hermit binge eating behavior of university students. In conclusion, it can be said that the level of anxiety that university students have is highly related to the binge eating behavior invisible to others. Therefore, hypothesis 6 was supported.

As a result of the verification of hypothesis 7 (depression propensity will affect reclusive binge eating behavior), the level of depression among university students did not significantly affect the hermit-type binge eating behavior (t=-.774, p>.05). In other words, it is interpreted that the level of anxiety rather than the depression tendency of university students induces hermit binge eating behavior. Therefore, efforts to lower the level of anxiety are required to reduce binge eating behavior that is hidden from others. In view of these results, hypothesis 7 was rejected(see Table 4 and Figure 2).

As a result of the verification of Hypothesis 8 (emotional clarity will have a mediating effect on hermit-type binge eating behavior), the mediating effect of emotional awareness clarity did not appear. In other words, the research hypothesis that giving university students a clear awareness of their current emotions would reduce the hermit binge eating behavior was not supported. That is, the hypothesis 8 of this study that increasing the clarity of emotional perception of university students could reduce the hermit binge eating behavior was not verified.In the future, it is considered necessary to attempt verification through treatments that directly enhance emotional clarity, not a method of measuring the level of emotional clarity(see Figure2).

Table 4: Hypothesis testing Results

Channel			Estimate	S.E.	C.R.	*p*	Hypothesis
Emotional Clarity	←	Friend Stress	-.260	.059	-4.388	***	H1, Accept

Emotional Clarity	←	Trait Anxiety	-.478	.170	-2.801	.005	H2, Accept
Emotional Clarity	←	Depression	-.405	.164	-2.462	.014	H3, Accept
Hermit Eating Behavior	←	Emotional Clarity	-.025	.060	.408	.683	H4, Reject
Hermit Eating Behavior	←	Friend Stress	.337	.060	5.619	***	H5, Accept
Hermit Eating Behavior	←	Trait Anxiety	.451	.163	2.776	.006	H6, Accept
Hermit Eating Behavior	←	Depression	-.119	.154	-.774	.439	H7, Reject
Hermit Eating Behavior	←						H8, Reject
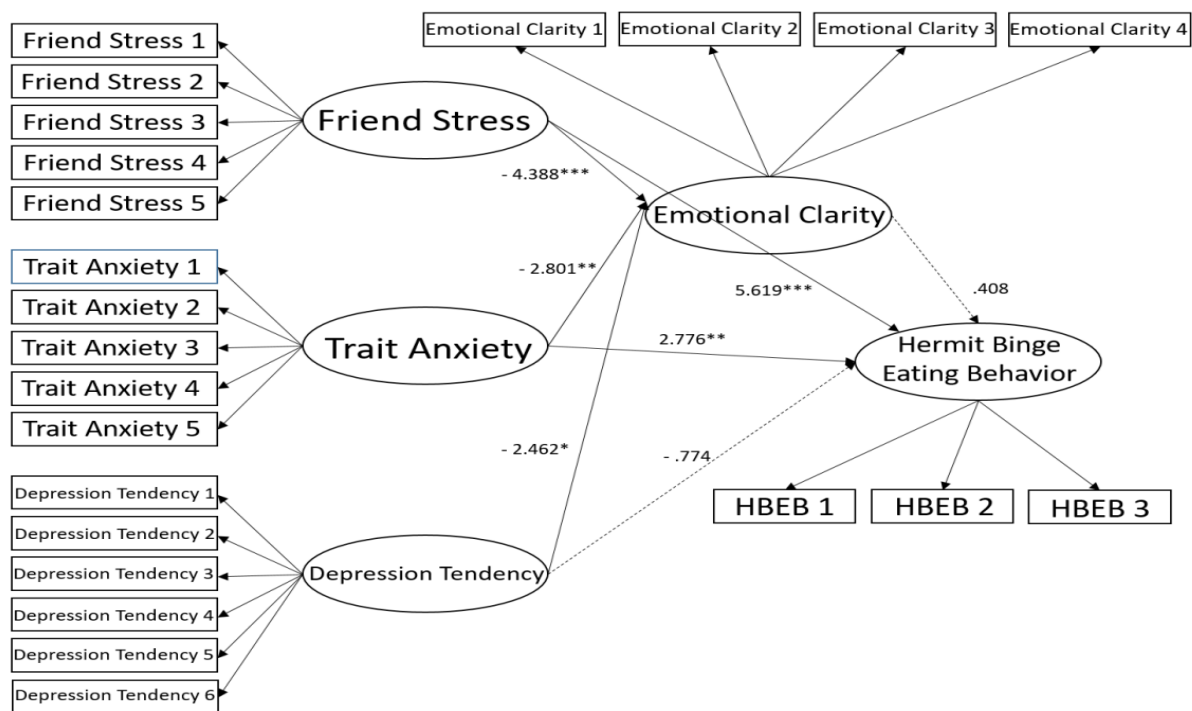
※ **A solid line is an accepted hypothesis and a dotted line a rejected hypothesis**
Figure 2: Finalized Research Model

CONCLUSION AND DISCUSSION

The results of this study are summarized as follows. First, it was shown that friend stress, trait anxiety, and depression tend to have a significant effect on emotional clarity. In other words, friend stress had a significant effect on emotional clarity (t = 4.388, p <.001). However, it was found that the higher the friend stress level, the lower the emotional clarity. Trait anxiety had a significant effect on emotional clarity (t = 2.801, p <.01). However, it was found that the higher the level of trait anxiety among college students, the lower the emotional perception clarity. The tendency of depression had a significant effect on emotional clarity (t = 2.462, p

<.05). However, it was found that the higher the depression tendency of college students, the lower the emotional perception clarity. In summarizing these results, it is interpreted that the emotions of college students (friend stress, trait anxiety, and depression) show a negative relationship with clarity in emotional perception.Therefore, efforts to lower negative emotions are required to increase the clarity of emotion recognition that college students have.

Second, friend stress and trait anxiety were found to have a significant effect on hermit-type binge eating behavior. In other words, friend stress had a significant effect on hermit-type binge eating behavior (t = 5.619, p <.001). Trait anxiety had a significant effect on hermit eating behavior (t = 2.776, p <.01). On the other hand, depression tendency did not affect hermit eating behavior (t =-. 774, p> .05). As a result of this, it can be said that among the emotions of college students, the stress of friends is the most influential on binge eating behavior that is hidden from others. In addition, it can be said that anxiety is more related to inducing binge eating behavior, which is not visible to others, rather than depression. Therefore, it is expected that efforts to reduce stress from close friends to college students can be a very effective way to reduce binge eating behavior.

Third, emotional clarity had no significant effect on hermit-type binge eating behavior. Therefore, no mediating effect was observed. In other words, the hypothesis of this study that increasing emotional clarity could reduce hermit-type binge eating was not verified. In the future, it is considered necessary to attempt verification through treatments that directly enhance emotional clarity rather than a method of measuring the level of emotional recognition clarity.

This study is valuable in confirming how the stress of friends, trait anxiety, and depression tend to affect hermit -type binge eating behavior among college students. In addition, it is meaningful that the recognition of emotional clarity confirmed the mediating effect of hermit type binge eating behavior. In addition, it is worth noting that the binge eating disorder behavior was subdivided into a hermit-type binge eating behavior, which is a self-eating behavior that is not seen by others.

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