



The Effect of Stress on Internet Game Addiction Trends in Adults: Mindfulness and Conscientiousness as Mediators

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Objective This study examined the mediating effect of mindfulness and conscientiousness among five factors on the effect of stress on Internet game addiction tendency.

Methods An online survey was conducted on 400 men and women between their 20s and 40s across Korea. The scales used in the study were the Internet game addiction scale based on the DSM-5, Perceived Stress Scale, Mindfulness Scale, and Five-Factor Personality Scale. For data analysis, structural equation modeling was conducted, and Sobel verification was carried out to verify the significance of the mediating effects.

Results The results of the study are as follows: Stress showed a positive correlation with Internet game addiction tendency, mindfulness mediated the effect of stress on Internet game addiction tendency.

Conclusion Of the five personality factors, conscientiousness also mediated the effect of stress on Internet game addiction tendency. This study highlights the need for further research for individuals with game addiction tendency.

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Key Words Internet game addiction; Big-five personality traits; Conscientiousness; Stress; Mindfulness.

INTRODUCTION

Game addiction is a form of behavioral addiction that shows impulsiveness, indifference to interpersonal relationships, association with other addictions, and psychological and physical symptoms when the game is stopped.¹ As most modern games are based on the Internet due to the development and dissemination of the Internet, the term “Internet gaming disorder” has been adopted to denote game addiction in a condition where DSM-5 requires further research: over the past 12 months, failure of excessive control over Internet games, obsession, ex-

perience of abstinence when games are stopped, decreased interest in other hobbies or entertainment, continuous use of tolerance, awareness of psychological and social problems, false reporting of Internet game playing time to others, and the use of Internet games to escape negative mood are factors used to diagnose Internet gaming disorders.

In addition, the 72nd World Health Organization (WHO) general assembly included “gaming disorders” in the 11th International Classification of Diseases (ICD) standard. In content, gaming disorder refers to continuous or repetitive game behavior patterns both online and offline. The criteria are continuing or expanding game play, even if it causes serious damage to the individual or to family, society, education, or employment, or important behaviors such as the inability to control the game (such as frequency, intensity, and duration), to such an extent that the game is given priority over other life concerns and priorities of everyday life. If all three of the above criteria are met and continue for more than 12 months, diagnosis will be made, but severe cases may be diagnosed after a shorter duration.

Internet game addiction makes it difficult to distinguish between the real world and the virtual world, and it leads to with-

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drawal symptoms such as anxiety and illusions when the individual is not playing games, leading to serious difficulty in concentration, poor academic performance, and daily life.²

Adults' addiction to Internet games can have more serious consequences than in children and teenagers. Adults primarily use gambling or violent games; show reduced social productivity; and experience personal impacts on their homes, jobs, and studies.³⁻⁵ In adults, Internet game addiction is also a direct cause of the disintegration and collapse of the family, and is likely to lead to anti-social behavior and crime.^{3,6}

Stress is defined as the physiological and psychological responses to internal and external perceptions of the body, whereby stress causes it to respond to specific needs.⁷ If stress is not addressed in everyday life events that threaten an individual's well-being when the resources or capabilities available to an individual have reached or exceeded his or her limits.^{8,9}

Depression, anxiety, neurosis, pain, and physical symptoms can emerge when stress is not resolved with appropriate coping methods and when avoidant coping methods are used.¹⁰ Avoidant coping involves avoiding stress stimuli by doing other unrelated tasks in stressful situations.¹¹

Many people choose various leisure activities to cope with stress,^{12,13} including using the Internet, which is easily and quickly accessible. People are more likely to develop Internet addiction when unsatisfactory experiences persist in their daily lives and when they fail to try other coping methods.¹⁴

Games account for a large portion of Internet use. One study found that games account for 81.3% of all content used among Internet and smartphone users. A considerable number of people who are prone to Internet addiction show markedly greater use of games than other content.¹⁵ In a survey of online game users, they ranked "to relieve stress" as the most common reason for gaming ("to get rid of stress," 59.9%).¹⁶ However, while games allow temporary relief of stress, they do not ultimately solve stress by addressing its cause. To determine how to use games as a means of relieving stress without experiencing addiction, research is needed to find the variables that mediate its use.¹⁷

Mindfulness is the process of intentionally observing the body and mind and accepting what is being experienced at that moment; Kabat-Zinn defined it as the ability to focus attention on the moment.^{18,19} Teasdale et al.²⁰ stated that "[u]sing cognitive therapy based on mindfulness, we can combine not to obsess with self-awareness, distance placement, and higher cognitive skills to recognize stress factors as temporary phenomena that pass by, and reduce stress through self- and threat awareness of self-awareness." It was also found that coping with stress through mindfulness meditation was effective in preventing and treating several bodily diseases caused by stress.²¹ Such a mindset is a strong cognitive behavioral response strategy²² in response

to stress events.

Mindfulness is used not only to cope with stress but also to treat addiction.²³ Mindfulness causes awareness of the triggers of addiction and reduces or prevents the desire for addiction so that other options are available.²⁴ It can help control Internet addiction and game addiction. Mindfulness enables receptive attention to momentary phenomena, allowing for conscious self-regulation by helping increase the awareness of problematic Internet use with a critical attitude.²⁵ In addition, it allows individuals to recognize their needs more clearly and respond to internal and external pressures more flexibly through an awareness of the state of conflict and maladjustment. Motivation for control of the game is thereby enhanced, leading to more controlled behavior.²⁶ These earlier studies suggest that, in situations involving stress, mindfulness is a factor that can reduce stress and, thus, can reduce the level of addictions, such as game addiction.

Lazarus and Folkman⁹ argued that under stress, personality has an important effect on assessing and coping with it. Personality leads to the determination of how to cope with stress and affects the perception of the efficacy of the coping method. In other words, differences in responding to stress events are based on differences in response styles depending on individual character.²⁷ In particular, among the five personality factors, conscientiousness is one that can predict stress. A study of college students conducted by Vollath and Torgersen²⁸ found that conscientiousness was related to stress experience and coping. High conscientiousness showed the most favorable profile for dealing with stress while low conscientiousness showed vulnerability to stress and coping.

Conscientiousness can develop even after adulthood. A study of adults aged 21 to 60 years showed that conscientiousness changed significantly throughout early and mid-adult periods, and that it was also found to change, albeit modestly, in later age groups as compared to their early years.²⁹ This personality factor, integrity, could change because the early stages of an adult career were marked by promotions and forming a committed partnership.^{30,31}

Conscientiousness refers to personality traits of a high self-regulation, a high sense of responsibility, observing social norms or principles, and diligence and order.³² Conscientiousness also has the strongest conceptual characteristics of controlling impulsiveness by acting to resist impulses, manage desires, and actively control behavior.³³ The impulse control of conscientiousness and its nature of behavioral control also allows it to control addiction behavior. In a study of teenagers and college students, subjects who showed high levels of Internet addiction showed poor conscientiousness.³⁴ A game addiction study of middle school students showed the negative correlation of conscientiousness with the effect on game addiction.³⁵

As discussed above, people who use evasive methods in stressful situations are likely to fall into Internet game addiction. In this process, it is assumed that mindfulness will lead to maintaining distance from stress situations and alleviate the craving for games by recognizing the triggers of game addiction, creating opportunities to make other choices. Personality also allows the assessment of and coping with stressful situations. In particular, conscientiousness is assumed to control current desires and impulses, thereby reducing Internet game addiction, an evasive way of coping.

The research questions are as follows: Research Question 1. Is greater stress associated with a greater likelihood of addiction to Internet games? Research Question 2. Will mindfulness mediate the effect of stress on internet game addiction tendency? Research Question 3. How is stress associated with the Five Factor in their effects on Internet game addiction?

METHODS

The object of study

Based on demographic ratios, online surveys of adults in their 20s to 40s across the country were conducted by research companies to collect the data. The data of 400 people who participated in the data collection were included in the final analysis, of whom 206 were men (51.5%) and 194 were women (48.5%). The age distribution was 28.5% were in their 20s, 33.3% in their 30s, and 38.5% in their 40s. The demographic characteristics of the study participants are shown in Table 1.

Analysis of internet game addiction ratios

The means and standard deviations of Internet game addiction measures were checked to determine the tendency of Internet game addiction across subjects. The average and standard deviation of the scale of game addiction were 1.27 and 2.04, respectively. Of all participants, 10.25% showed a tendency toward addiction to Internet games, as shown in Table 2. This figure is similar to that found in the Korea Creative Content Agency's¹⁵ survey of gaming and immersion, which found rates of 2.8% for over-indulgence and 10.9% for over-indulgence risk.

Measurements

Internet Game Addiction Trends Scale

The measure of Internet game addiction was developed by Petry et al.³⁶ based on the DSM-5. The scale has been translated into a total of 11 languages using recommendations on the process of translation and application of the World Health Organization's scale, including South Korea, and that was available for use in this study without needing translation. It in-

Table 1. The demographic characteristics of the participants

Categories	Frequency	Ratio
Gender		
Men	206	51.5
Women	194	48.5
Current age		
20–29	114	28.5
30–39	133	33.3
40–49	153	38.5
Educational attainment		
High school graduate	51	12.8
College student	38	9.5
College graduate	283	75.3
Post-graduate or higher	28	7.0
Occupation		
Officer	253	63.3
Student	58	14.5
Freelance	17	4.3
Not employed	39	9.8
Other	33	8.3
Monthly income		
Less than 2 million won	163	40.7
Less than 4 million won	157	39.3
Less than 6 million won	68	17.0
Over 6 million won	12	3.0

Table 2. Results of participants' tendency to addiction to Internet games

Classification of addiction orientations	Frequency	Ratio
Addiction trend group	41	10.25
General usage group	359	89.75

cludes a total of nine questions, e.g., “Do you spend a lot of time thinking about the game even when you are not playing, or planning when you are not able to play next?” and “Do you feel lethargy, irritation, depression, anger, worry, sadness?” and each sentence is in the form of a yes/no question. Since this study was conducted on average adults, the term “gaming addiction tendency” was adopted in place of “game addiction.” In this study, the internal convergence was found to be 0.833.

Stress Scale

A perceived stress scale developed by Cohen et al.³⁷ and adapted by Park and Seo³⁸ was applied. The perceived stress scale consisted of a total of 14 questions scored on a five-point Likert scale: very often=4, quite often=3, sometimes=2, nearly never=1, and never=0.

The perceived stress measures in the study of the reform and

validity of Park and Seo³⁸ are divided into two sub-factors, “positive perception” and “negative perception.” However, in a previous study³⁹ that validated the perceived stress scale, the overall level of perceptual stress was assessed by adding the two sub-factors together. The study by Park and Seo³⁸ indicated that the two sub-factors assessed different aspects of stress as the questions on “positive perception” had less to do with “negative perception” even after being scored inversely. These perceived stress measures were also identified in other teacher studies.^{40,41}

Of the two sub-factors, the questions of “negative perception” confirm the uncontrollable, unpredictable, and overwhelming character of such a perception and indicate that the higher this score, the more stressful it is. Preliminary studies show that the convergence of measurement models with two factors of negative and positive perception is not high, so this study assessed stress using only the “negative perception” scale of the sub-factors. The content consists of seven questions, e.g., “How many times did something unexpected happen that made you upset?” and “How many times did you feel that important things were out of control?” The internal compatibility in Park and Seo³⁸ was 0.760, while in this study it was 0.827.

Mindfulness Scale

The mindfulness scale developed by Park⁴² was used, consisting of 20 questions, including “It’s hard to focus my mind on one thing or task” and “I often miss what’s going on around me.” The scale is scored on a five-point Likert scale (totally disagree=1, slightly disagree=2, neutral=3, slightly agree=4, and totally agree=5). This scale comprises four subfactors: concentration, critical acceptance, current awareness, and decentralization.

The questions are reverse-scored, meaning that the lower the score, the greater the mindfulness. In this study, the collected data were scored such that the higher the score, the greater the mindfulness.

In Park,⁴² the reliability of the mindfulness scale was shown by an internal consistency of 0.88, with values for concentration of attention of 0.79, critical acceptance of 0.82, present self-awareness of 0.76, and de-centeredness of 0.83. Its internal consistency in this study was 0.950.

Five-Factor Personality Scale

Based on the NEO-PI-R five-factor scale developed by Costa and McCrae,⁴³ Lee and Ahn⁴⁴ developed the five-factor personality scale used in this study. The scale comprises 25 questions, with sub-factors of extroversion, agreeableness, conscientiousness, neuroticism, and openness to experience, each including 5 questions. The content of conscientiousness examined in this paper was measured with the items, “I think I organize and manage people well,” “I strive to achieve the goals

I set,” “I try to control myself,” and “I certainly handle my duties.” The question consists of a five-point Likert scale (totally disagree=1, slightly disagree=2, neutral=3, slightly agree=4, and totally agree=5). In Park,⁴⁵ the internal consistency was 0.77, and the internal consistency of this scale in this study was 0.779.

Data analysis

Data from this study were analyzed with SPSS 18.0 (SPSS Inc., Chicago, IL, USA) and AMOS 21.0 (IBM Corp, Armonk, NY, USA). The specific procedure was as follows: first, a descriptive statistical analysis was conducted to identify the demographic characteristics and reliability of all measures. Second, structural equation modelling was performed using AMOS 21.0, and the research hypothesis was verified by considering the path coefficients of the structural equation model. The results of correlation analysis were presented in Table 3.

Structural equation model analysis

A research model was constructed to examine whether stress affects Internet game addiction through conscientiousness among the five factors of mindfulness and personality. Internet game addiction is an independent variable and stress is a single dependent variable, while mindfulness is a parameter measured with attention, critical acceptance, current awareness, and decentralism. Among the five parameters of personality, factors other than integrity were removed from the model due to the lack of significant condensation.

To confirm the suitability of the model, the fit of the research model was verified and compared with that of a competing model. The model’s goodness-of-fit assessment was determined by the χ^2 value and goodness-of-fit index.

The same model may or may not be rejected depending on its size, so CFI, TLI, and RMSEA were calculated. CFI and TLI represent good suitability for values above 0.09, RMSEA values below 0.05, good fit if below 0.08, and good fit if below 0.10 are normally considered.⁴⁶

This study was approved by the Korea Counseling Graduate University Institutional Review Board (17-2-R-02-01).

RESULTS

Structural equation model analysis

Verifiable factor analysis was conducted to determine the validity of the measurements before analysis. Verification confirmed that the fit of the measurement model was good: $\chi^2=46.319$ (df=16, p=0.001), CFI=0.982, TLI=0.969, RMSEA=0.069, 90% confidence interval=(0.046, 0.092). In addition, the factor load of the measurement variables for the potential variables was significant at p<0.001. Therefore, the measurement model in this study was appropriately designed. The re-

Table 3. Correlation coefficients between variables (N=400)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Negative perception 1	-													
2 Negative perception 2	0.617*	-												
3 Total stress	0.881*	0.916*	-											
4 Internet game addiction	0.185*	0.127†	0.171*	-										
5 De-centered attention	-0.414*	-0.314*	-0.400*	-0.303*	-									
6 Present awareness	-0.327*	-0.216*	-0.296*	-0.401*	0.678*	-								
7 Non-judgemental acceptance	-0.313*	-0.223*	-0.293*	-0.423*	0.728*	0.805*	-							
8 Concentration	-0.308*	-0.214*	-0.285*	-0.462*	0.697*	0.792*	0.840*	-						
9 Total mindfulness	-0.379*	-0.269*	-0.355*	-0.436*	0.865*	0.906*	0.931*	0.914*	-					
10 Extraversion	-0.264*	-0.188*	-0.248*	-0.170*	0.309*	0.291*	0.261*	0.299*	0.321*	-				
11 Conscientiousness	-0.206*	-0.144*	-0.192*	-0.215*	0.233*	0.253*	0.250*	0.325*	0.291*	0.661*	-			
12 Neuroticism	0.395*	0.315*	0.391*	0.306*	-0.569*	-0.483*	-0.490*	-0.506*	-0.568*	-0.269*	-0.173*	-		
13 Agreeableness	-0.114†	-0.050	-0.088	-0.081	0.058	0.047	0.051	0.075	0.063	0.506*	0.433*	-0.022	-	
14 Openness	-0.019	0.074	0.035	-0.035	0.000	0.072	0.005	0.020	0.027	0.433*	0.398*	0.077	0.316*	-

*p<0.01; †p<0.05

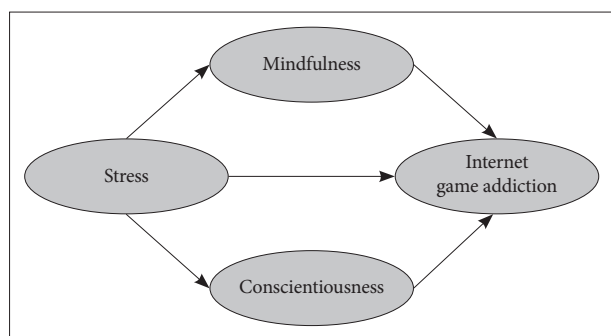


Figure 1. Research mode.

search model and measurement model are presented in Figures 1 and 2 respectively.

Verification of the research model and competing model

Figure 3 shows the research model used to verify the effectiveness of mindfulness and conscientiousness, a variable that mediates between stress and Internet game addiction, and the competing model is shown in Figure 4. The research model is a partial model, while the competing model is a complete model.

The research model validated the data as appropriate, but the path from stress to Internet game addiction was not statistically significant. Validation of the competition model also found that it was appropriate, as $\Delta\chi^2 < 3.84$ when verifying the differences between the suitability of the competitive model and the study model. These results indicate that the differences in explanatory power between the two models were not statistically significant, so a more succinct, statistically insignificant path was chosen as the final model. These results were presented in Ta-

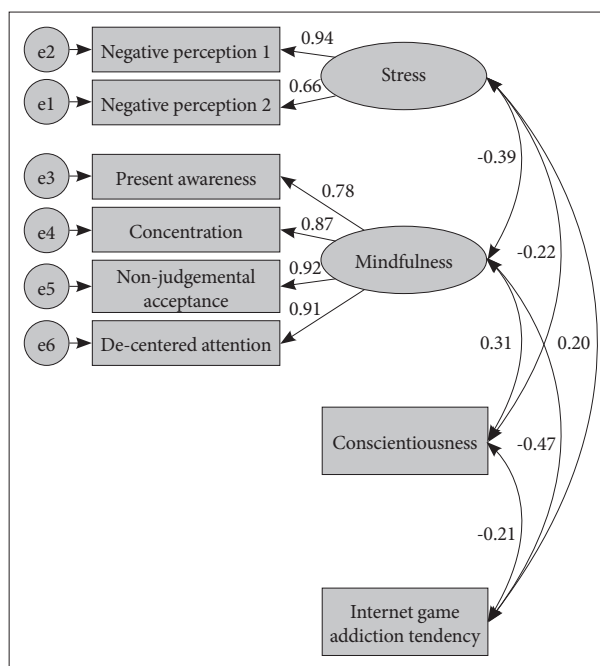


Figure 2. Verifying factors analysis for the measurement model.

ble 4. The path coefficients for the last selected study model are listed in Table 5.

Verification of the effects of mindfulness and conscientiousness on the effect of stress on internet game addiction tendency

Bootstrap analysis and Sobel verification were conducted to verify the statistical significance of the mediating path from stress to the internet gaming addiction tendency. According

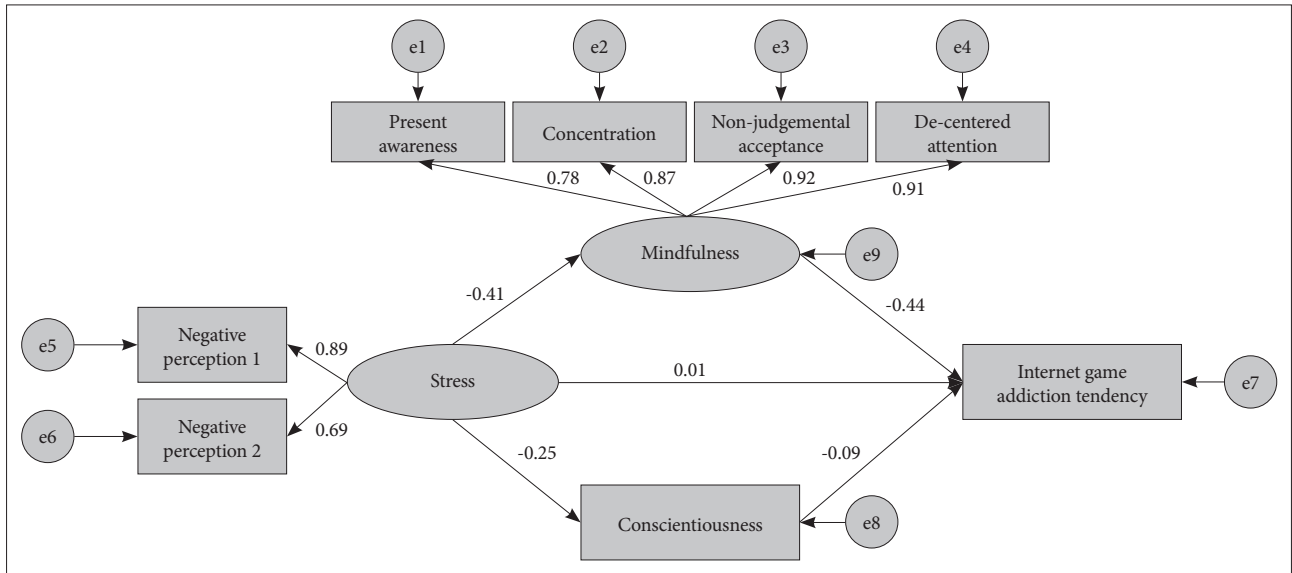


Figure 3. Research model (partial model).

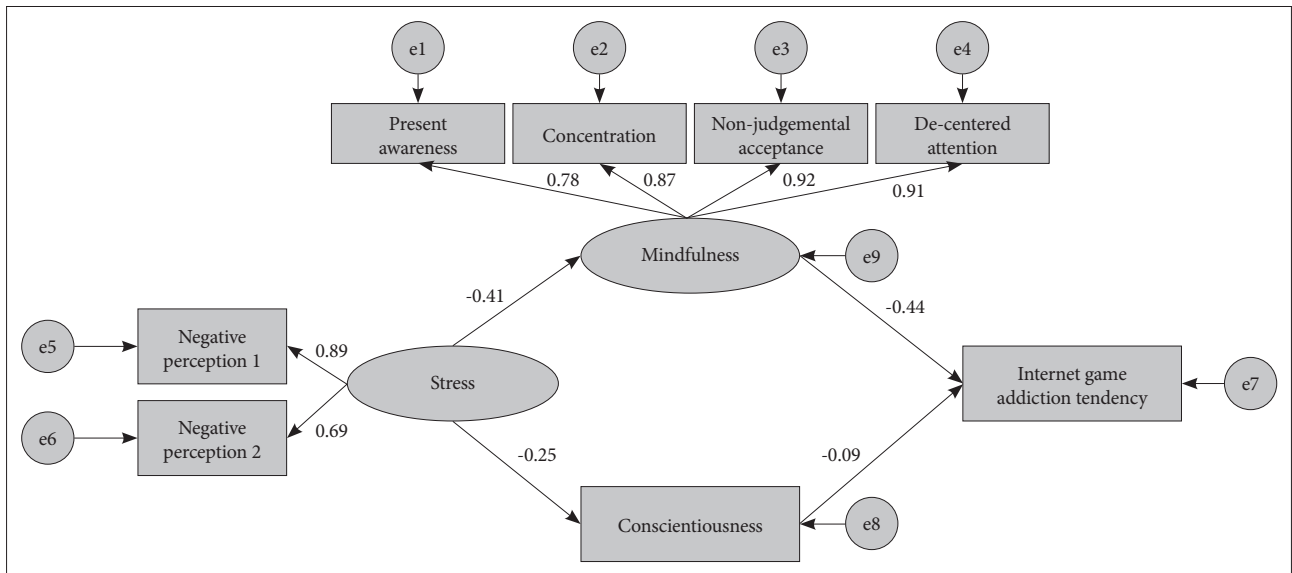


Figure 4. Competitive model (full-mediating model).

Table 4. Comparing study models and competition models to suitability

	χ^2	df	TLI	CFI	RMSEA
Research model	67.724	17	0.951	0.970	0.086
Competing model	67.740	18	0.971	0.971	0.083

TLI, Tucker-Lewis Index; CFI, Comparative Fit Index

to the Sobel test results, both pathways were significant. These results are presented in Table 6. The mediating path was also found to be significant in the bootstrap analysis result. It was found that the value in the 95% confidence interval did not contain 0, indicating that the mediation pathways were significant. These results are also presented in Table 6.

DISCUSSION

In this study, we examined whether stress affects the tendency of Internet game addiction and investigated the influence of conscientiousness among the five factors in mind and personality as a variable that can cause Internet game use to decrease even in stressful situations.

The main results of this study are as follows: first, there is a consistent correlation between stress and Internet game addiction tendencies. These results support the results of studies showing that the greater the stress, the greater the likelihood of addiction to Internet games.^{17,46,47} These results are similar to studies examining the correlation between stress and Internet addic-

Table 5. Path coefficients for the final model

Path	Non-standardization factor	Standardization factor	SE	CR
Stress → mindfulness	-0.723	-0.414	0.119	-6.069
Stress → conscientiousness	-0.315	-0.246	0.075	-4.221
Mindfulness → Internet game addiction	-0.252	-0.444	0.028	-8.925
Conscientiousness → Internet game addiction	-0.068	-0.088	0.035	-1.958

SE, standard error; CR, critical ratio

Table 6. Sobel verification results

Path	Non-standardized estimation	Standard error	Sobel verification
Stress → mindfulness	-1.222	-0.057	5.929
Mindfulness → Internet game addiction	0.161	0.006	
Stress → conscientiousness	-0.112	-0.147	2.697
Conscientiousness → Internet game addiction	0.029	0.039	
Bootstrap results of the mediating path 95% CI		(0.137–0.282)	

tion.⁴⁸⁻⁵³ Both Internet game addiction and Internet addiction are correlated with stress, which can be inferred from earlier studies showing that game addiction and Internet addiction are related.^{54,55}

Second, extroversion, conscientiousness, and neuroticism among the five factors of personality and mindfulness showed a significant correlation with stress and Internet game addiction tendency. The relationship between stress and mindfulness shows the same results as were found in several studies conducted since Kabat-Zinn introduced mindfulness as a way to reduce stress.^{18,20,21,56} Of the relationships between the sub-components of stress and care, the highest correlation was shown with decentralism. These results support prior studies suggesting that the greater the decentralism, the lower the stress.^{57,58} Other sub-variables of mindfulness also showed a relationship between stress and ineligibility, as found in other studies.^{59,60} An attitude that allows the objective observation of the state of the mind through mindfulness will not show a pattern of seeking to prove negative thoughts related to stress events or constantly argue about them. Proper care of the mind facilitates less stressful experiences through a distancing from thinking and emotions.⁶¹

Next, the relationship between mindfulness and the tendency to become addicted to Internet games supports the results of an earlier study,⁶² as well as a teacher's study dealing with mind-caring and direct route to Internet game addiction in Korea,⁶³ and a further study showing that Internet addiction decreases as mind-caring increases. These above-mentioned results concerning game addiction and Internet addiction^{54,55} found that the higher the mindfulness, the lower the tendency of Internet game addiction. If addiction behavior is the result of an automatic response of the mind, the individual's appropriate mind-set can control it by making it possible to recognize

and control addiction, a habitual phenomenon that is automatically handled through mindfulness.⁶⁴

Neuropathy showed static correlation with both stress and Internet game addiction, while extroversion and conscientiousness showed an insignificant correlation between stress and Internet game addiction. These results are similar to those of studies that identified relationships between neurosis and stress.^{28,65-67} A person with a high neurological tendency is more likely to be exposed to stress and is more likely to be under stress than others.⁶⁸ Extroverts were also found to be flexible in studies that identified their relationship with extroversion and stress.^{69,70} Extroverts are less stressed by responding to rational actions and positive thinking, which are methods for actively coping with problems.⁷¹ The results of studies with integrity and stress also support this conclusion.^{28,65,69,70,72,73} A person with a high level of integrity tries to address stress situations and appears to address the emotional pain and anxiety caused by stress.⁷⁴

In terms of the five factors and the tendency to Internet game addiction, neurosis was not related to the tendency to Internet game addiction and is not related to extroversion and conscientiousness. This is similar to Lee's³⁵ result that in the relationship between the five factors and Internet game addiction, neurological disorders are statistically related to integrity, openness, affinity, and extroversion, as well as to the results of previous studies that looked at the correlation between the five factors and Internet addiction.^{34,75,76}

This study found that among personality factors, neuroticism, extroversion, and conscientiousness are related to the tendency of Internet game addiction. The more neurosis or less extroversion and conscientiousness an individual has, the greater the likelihood of becoming addicted to Internet games. People with high levels of neuroticism may show a tendency to fall into Internet game addiction because of low emotional stabil-

ity, a tendency to fail to adapt in everyday life, while those with high conscientiousness may show less tendency to Internet game addiction because they are goal-oriented and achievement-oriented, thus striving to control their behavior. Individuals high in extroversion like to meet and date others, showing that they expect to maintain more intimate relationships. Thus, they appear to have lower Internet game addiction tendencies due to their orientation toward the real world rather than virtual subjects.

Third, the structural equation model was verified to check whether mindfulness and conscientiousness act as parameters in the relationship between stress and Internet game addiction tendencies. Verification found the parameters to fully mediate the effects of stress on Internet game addiction tendency. In the association of stress and Internet game addiction tendency, mindfulness and conscientiousness showed a major relationship with stress and Internet game addiction.

Mindfulness had a mediating effect on stress and Internet game addiction such that the higher the stress, the lower the mindfulness, and the lower the mindset, the higher the tendency to Internet game addiction. There has been no study of mind-caring and Internet game addiction among Korean studies, but this result is similar to that of a study⁵³ that found mind-caring to mediate stress and Internet addiction, and another study.⁵⁹ Addiction controls the individual if it arises as an automatic response of the mind. Mindfulness allows the individual to make decisions about control by noticing and considering habitual behaviors that are automatically handled.

Among the five factors, the mediating effect of conscientiousness and tendency to increased Internet game addiction is such that the higher the stress, the lower the level of conscientiousness and the higher the tendency to increased Internet game addiction. These results are similar to those of one study⁷⁰ that found that high conscientiousness reduces job stress, and another that high conscientiousness reduces Internet game addiction.³⁵

This study has the following significance in helping physicians treat the overuse of games. First, this study examined the variables that influence adult Internet game addiction tendencies. Most earlier studies of game addiction involved children and teenagers. There is a need to intervene for present-day adults who were teenagers when Internet games first became popular, and to do so it is necessary to understand the tendency of adults to become addicted to Internet games.

Second, this study confirmed mindfulness and conscientiousness as variables that mediate the relationship between stress and Internet game addiction tendency. There has been no previous study examining the mediating effects of both mental care and conscientiousness between stress and the tendency of Internet game addiction. This study thus allows us to further expand our knowledge of the path from stress to Internet game

addiction.

Third, mindfulness can be used to reduce Internet game addiction through counseling processes or programs. It is believed that existing mindfulness programs can be applied as interventions in Internet game addiction based on the results of expanded research.^{59,77}

During counseling, the counselor will assign tasks to accurately understand the stress and feelings of interviewees addicted to games so as to objectively view their experiences in situations even outside the consultation period, and then give feedback regarding self-control by helping them recognize stress, sexual emotions, and behavior. This repetition of the process will allow the interviewee to positively use games that were previously used only as a means of avoidance.

We will also be able to train individuals showing a tendency to Internet game addiction to realize and control what happens automatically. By controlling themselves through mindfulness, individuals might be trained to use games well and reduce excessive game use.

Fourth, the higher the level of conscientiousness among the five factors, the stronger their stress and the lower their tendency to Internet game addiction. This finding may serve as a basis for establishing a counseling intervention strategy that can help physicians express the factors of conscientiousness found in the counseling session.

In adulthood, one's personality can continue to change due to the circumstances in which responsibilities are given.²⁹ During counseling, counselors will be able to improve their integrity by helping interviewees change their environment to the greatest extent possible by developing relationships with counselors and those around them. As the level of conscientiousness increases, we can expect that the tendency of the inpatients to become game addicts to concurrently decrease.

Finally, we point out the following limitations and suggestions for subsequent research. First, the study was limited to those between their 20s and 40s. However, 58.6% of game users in their 50s or older and 51.9% of those aged 60 to 65 years are expected to need study in addition to those in their 20s and 30s. In addition, the proportion of subjects in their early twenties was only 9% in the subjects of this study, so the moderating effect according to the age group could not be verified. However, in the follow-up study, it may be necessary to conduct a comparative study between the group from the late teens to the early 20s and the adult group thereafter. This is because mediating effects may differ depending on age.

Second, the measure of Internet game addiction used in this study consists of questions prepared based on the criteria of Internet gaming disorder in the Conditions for Further Study (DSM-5). Therefore, as debate over the conceptualization and appropriateness of diagnosis standards for Internet game ad-

diction still persists, the study of appropriate measures should continue.

Availability of Data and Material

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: all authors. Formal analysis: Jae Woo Park, Taeyeong Choi. Data curation: Jae Woo Park, Taeyeong Choi. Investigation: all authors. Project administration: Taeyeong Choi. Investigation: all authors. Methodology: Jae Woo Park, Taeyeong Choi. Resources: all authors. Supervision: Jae Woo Park, Dai-jin Kim. Validation: Jae Woo Park, Dai-jin Kim. Visualization: Taeyeong Choi. Writing—original draft: Taeyeong Choi. Writing—review & editing: all authors.

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