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The Effect of Perceived Stress on Suicidal Ideation Due to COVID-19 of College Students: Focusing on the Mediating Effect of Hopelessness

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Abstract

The purpose of this study is to examine whether there is a mediating effect of hopelessness the relationship between perceived stress and suicidal ideation in college students. For this study, a survey was conducted on perceived stress, suicidal ideation, and mental health, self-esteem, problem drinking, and stress among 103 college students in Gyeonggi do. The results of this study are as follows. It was found that COVID-19 correlated with perceived stress, hopelessness, and suicidal ideation of college students. The hopelessness completely mediated between perceived stress and suicidal thoughts of college students, which is consistent with previous studies. This study is meaningful in that it confirmed relationship between the perceived stress, hopelessness, and suicidal ideations in college students due to COVID-19, reflecting the new situation of the times. Coronavirus will worsen people's mental health disorders and cause new stress-related disorders. Therefore, mental health researchers, clinicians, and people working in trauma-related fields should find ways to reduce the incidence of coronavirus-related trauma stress and prevent its effects. It is necessary to expand the psychological vaccine program to improve the resilience of the public. Since there are individual differences in resilience, it is necessary to strengthen the psychological vaccine program for each subject considering resilience.

Keywords: COVID-19, suicidal ideation, stress, hopelessness

Major classifications: Nursing and Mental Health, Public Health

1. Introduction

The world is facing a catastrophic situation caused by a novel infectious disease called COVID-19. As of October 15, 2021, there are a total of 238,667,971 confirmed cases worldwide and 4,869,206 deaths. In Korea, there are 339,361 confirmed cases and 2,626 deaths (fatal rate of 0.77%) (Central Disaster Management Headquarters, 2021).

According to data from the U.S. Centers for Disease Control and Prevention (CDC, 2021), during the week of the end of June 2020, 40.9% of those surveyed answered that they had experienced psychological and behavioral abnormalities related to the pandemic. Among them, psychological anxiety and depressive symptoms showed a significant increase from April to June. 11% of those who said they were in a situation serious enough to seriously consider suicide.

According to the Korea Institute of Finance (2020), the stock market plunged due to concerns about corporate performance deterioration and economic recession due to COVID-19. On March 19, 2020, the KOSPI index fell to 1,457 points, the lowest level in 11 years. The decrease in demand due to social distancing resulted in an immediate decrease in sales of the self-employed, small business owners, and Small and Medium-Sized Enterprise. A contraction in global demand led to a decrease in exports, resulting in an export shock, recording -24.3% of exports in April compared to the same month of the previous year and -20.3% on May 1~20.

In the case of universities in 2020, all events such as graduation ceremonies and entrance ceremonies have been canceled to prevent infectious diseases, and the start date has also been postponed from March 2 to March 16. We made several amendments, such as extending the period of home-based classes from two weeks to indefinitely and introduced the 'Period Intensive Completion System' for experimental and practical subjects based on non-face-to-face lectures for one semester, or partly apply for the 'final exam' in advance. We are preparing to prevent students from being exposed to close environments, such as taking environmental measures to prevent the spread of COVID-19 for one subject and then conducting face-to-face tests (Yang, 2020).

These social and economic difficulties have a negative impact on the mental health of the entire nation. According to a study by Lee (2020), the national stress due to COVID-19 was 3.7 points out of 5 points, which is 1.5 times that of MERS and 1.4 times that of the Gyeongju and Pohang earthquakes. In addition, 20% of the people are experiencing sleep disturbances due to COVID-19. Stress and sleep disorders caused by COVID-19 are highly likely to lead to depressive symptoms, and 48% of Koreans experienced depression (Lee, 2020).

As depression is known as the most representative risk factor for suicide (Park & Jung, 2010; Um & Jeon, 2014), if severe depression persists due to the prolonged COVID-19 crisis, it may lead to suicidal thoughts and eventually develop into suicide attempts. Suicidal ideation was found to be the leading factor in a series of suicidal behaviors and was found to increase the risk of actual suicide as well as a precursor to subsequent suicide attempts or actual suicide (Borges et al., 2010). In 2020, sisters in their 60s, who were unable to operate karaoke due to an executive order of the Korean government to ban gatherings, made an extreme choice due to economic difficulties and burden of debt due to Corona 19 (Joongang Ilbo, 2020.9.4.)

COVID-19 negatively affects mental health. College students complain of instable psychological conditions. They experience complex and confusing emotions in an environment where various challenges and tasks are given to become future members of society in their early adulthood. Due to these psychological burdens and conflicts, college students may be threatened mentally and attempt to do impulsive suicide (Kim, 2013). The Korean National Statistical Office announced in 2016 that suicide was the number one cause of death for young people in their teens, 20s, and 30s in Korea. The lifetime suicidal thoughts rate of college students was 32.3%, the suicide planning rate was 4.7%, and the suicide attempt rate was 3.0%, and 42.2% of college students experienced severe or higher depression related to suicide (Kim, 2012). With the prolonged COVID-19, it can be predicted that college students' mental health is more likely to be exposed to greater risks.

Hopelessness is an important variable in depression with negative thoughts about the future, that is, the belief that nothing can be done, and nothing will be done to change misfortune or pain (Abramson, Metalsky, & Alloy, 1989). Beck, Steer, and Newman (1993) demonstrated that hopelessness explained suicidal ideation 1.3 times more than depression, and as a result, hopelessness was the most powerful variable predicting suicide death. In addition, a 13-year longitudinal study by Kuo, Gallo and Eaton (2004) confirmed that the relationship between suicide behavior and hopelessness even after controlling demographic variables and psycho-pathological variables such as depression and substance abuse showed the strongest statistical significance for suicidal ideation, suicide attempts, and suicide deaths. Therefore, this study investigated the effect of perceived stress of college students due to COVID-19 on suicidal ideation, and to determine whether hopelessness plays a controlling role in the relationship. Based on these results, we intend to derive implications for the prevention of suicide in college students due to the prolonged COVID-19.

2. Theoretical Background

2.1. COVID-19

According to the Korea Centers for Disease Control and Prevention (2020), COVID-19 first mass outbreak occurred in December 2019 in Wuhan, Hubei Province, China. It was initially called "Wuhan pneumonia" by combining the names and symptoms of the outbreak site, but according to the Korea Centers for Disease Control and Prevention, the Korean language is coronavirus infection-19 or Corona-19, and the English is COVID-19 in February 2020. "CO" means corona, "VI" means virus, "D" means disease, and "19" means 2019 when the outbreak was first reported. It refers to respiratory syndrome caused by SARS-CoV-2 infection, and the pathogen is an RNA virus with a size of 27 to 32 kb belonging to the Coronaviridae family, and its official name is SARS-CoV-2. Among legal infectious diseases, the disease code is U07.1 and is the first-class infectious disease and new infectious disease syndrome. The transmission route so far is known to be infected when contacting droplets from coughing or sneezing and objects contaminated with COVID-19 and touching the respiratory system and around the eyes without washing hands. The incubation period is up to 14 days and an average of 4 to 7 days (Korea Centers for Disease Control and Prevention, 2020). Symptoms range from mild to severe, accompanied by boredom, fever, cough, and difficulty breathing, and in severe cases, pneumonia also occurs. In addition, there are various types such as sore throat, headache, and diarrhea. The fatality rate is 3.5% based on WHO, but the transmission rate and mortality rate vary depending on the type of virus. In the social risk of infectious diseases, prevention is the only state of physical and social distancing other than the method of continuously thorough personal hygiene and quarantine (Choi, 2020).

In the study of Choi (2020), the characteristics related to symptoms of COVID-19 are as follows. First, it is highly contagious from the beginning of the outbreak. Unlike other viruses, the virus is estimated to have a high emission rate even if it is asymptomatic at the beginning of the outbreak or if the symptoms are mild. Second, it is a corona-based respiratory infection virus such as MERS, which has a much higher transmission power than SARS and MERS, and has a great transmission power during incubation periods, which is much more dangerous as it can spread to local infections without symptoms or mild symptoms. Third, pneumonia can lead to sudden deterioration. Fourth, initial diagnosis is difficult with X-rays. Fifth, it is difficult to diagnose pneumonia due to various symptoms. Sixth, it is easy to misunderstand because symptoms are like cold and body aches in the early stages. Even if they are asymptomatic or mild, they are highly contagious, so caution and personal hygiene at the level of personal quarantine are essential. Vaccinations and treatments have been developed, but physical and social distancing is a very important factor in responding to COVID-19.

In the case of Korea, it was managed to some extent before February 18, 2020, but since then, the number of confirmed cases has exploded as Daegu and Gyeongsangbuk-do have been rapidly transmitted due to the mass infection of Shincheonji believers. On February 23, 2020, the infectious disease crisis alert was raised from the alert stage to the highest level of seriousness, and on February 29, 909 people, the highest daily number, were confirmed within a day. On March 11, the WHO declared a global pandemic of new infectious diseases (pandemic). This was the third pandemic declaration worldwide since the Hong Kong flu (1968) and swine flu (2009). Since then, physical, and social distancing has been implemented to some extent, and sporadic group infections such as Itaewon Club, Coupang Logistics Center, and small religious group infections have been occurring everywhere. On May 13, 2020 (local time), the WHO declared an additional Endemic (periodic outbreak) that can continue to occur periodically and for a long time in the community in relation to COVID-19. It is time to prepare for a life with Corona with the hope of controlling the COVID-19 situation with vaccination.

2.2. Perceived Stress

Unlike the quantitative stress concept that simply occurs in life events, perceived stress relates to how one controls one's response in stressful situations (Skaggs, Prather, Gross, & Thompson, 2007; Larsen, 2000). Even in the same situation and event, the level of perceived stress varies depending on the individual's values and the perspective of recognizing and evaluating the event (Ha, 2011). Weinstein, Brown, and Ryan (2008) stated that individual cognitive evaluations of stress were preceded first, and then perceived stress was different according to each acceptance level. In addition, perceived stress is perceived as an evaluation perception of personal values or emotions, and when the good and bad of a situation or event exceeds one's acceptance criteria in the process of evaluating one's emotions or values (Lazarus & Folkman, 1984; Roth & Cohen, 1986). Folkman et al. (1986) saw that stress occurs when they perceive that certain expectations and demands cannot be met beyond their abilities. Perceived stress is defined as recognizing and responding to stress due to a lack of

resources to cope with the environment, regardless of whether the environment you are threatening an individual (Cohen, Kamarck & Mermelstein, 1983). That is, even with the same stress stimulus, the stress experience varies depending on how the individual perceives it (Lazarus, 1974). In addition, when perceived stress is excessive, it is difficult to cope with environmental events (Cohen & Williamson, 1991).

2.3. Hopelessness

Beck et al. (1967) defined it as a belief that unwanted events occur in the future or that he expects to continue to fail. In addition, hopelessness means that there is a high possibility that desirable or hateful performance will occur, and that no reaction one can make will change this possibility (Abramson, Metalsky, & Alloy, 1989). In other words, hopelessness is a negative thought that the desired result will not occur in the future and a state of despair that no one can change this situation. A person deeply in hopelessness lacks the motivation and energy to solve the difficulties or problems faced in everything, and experiences negative emotions such as cold talk, sadness, and pessimism and subsequent actions. Hopelessness can also lead to thoughts and attempts at sleep disorders, depression, attention deficit, mental retardation, or suicide (Abramson, Metalsky, & Alloy, 1989).

2.4. Perceived Stress and hopelessness

In McQuay et al. (1997)'s 'Scream due to Pain' model, the process from suicide behavior was largely divided into three. First, a specific situation evokes a feeling of failure or rejection. Second, individuals want to escape from these negative situations, but conclude that they cannot. Third, it is judged that there are no salvation factors such as social support to alleviate the crisis. The first process here is to perceive a particular situation as stress, and the second and third processes mean despair, lethargy, or hopelessness, that there will be no desired results in the future, hateful and negative results, and nothing can improve this situation. In other words, when negative life events are perceived as stress, individuals want to get out of such situations, but they cannot find a way to improve them, and eventually feel hopeless (Oh, 2013).

Another theory that explains the relationship between perceived stress and hopelessness is the hopelessness theory. The theory of hopelessness was developed in 1989 by Abramson, Metalsky, and Alloy (1989) by accepting the stress-diathesis model (Zuckerman, 1999), explaining the process in which negative life events interact with individual psychological vulnerabilities and lead to hopelessness. In fact, in a study by Kim and Cho (2009) targeting college students, it was reported that stress influenced hopelessness.

2.5. Suicide

Suicide refers to the act of intentionally taking one's own life, and the etymology of suicide also means to kill oneself (caido), Latin (Durkheim, 1987). Freud (1917) viewed suicide as an extension of depression and conceptualized the unconscious aggression toward the beloved object, into which ambivalent emotions were immersed, as anger toward the inside. Jung (1923) defined suicide as a desire for mental regeneration to a person who already feels that he has lost all meaning of life. Adler (1964) describes it as attempting to manipulate others within the environment. Judith and Shapiro (1982) defined suicide as harming or endangering themselves, resulting in death. Durkheim (1987) defined it as a death performed directly or indirectly by doing positive or negative actions, knowing that his actions would have any consequences. The World Health Organization (2001) defined suicide as an act that damages oneself while recognizing the intention and motivation of death as a case of causing death due to suicide. These suicides can be largely divided into suicidal thoughts, suicidal plans, and suicidal attempts. Reynold (1991) stated that suicidal ideation refers to total thoughts and ideation about death, suicide, and serious self-injury behavior.

Since suicidal ideation appear first among all suicide-related behaviors, they can be seen as a primary factor in screening the risk of suicide. Hong (2004) classified suicide behavior into four dimensions: suicide accident, suicide plan, suicide attempt, and suicide execution. Suicidal ideation usually refers to cases where you have plans and thoughts to commit suicide but do not move into action. Suicidal ideation can be said to be a very important clue that can cause suicide attempts and suicidal behavior, and suicidal ideation do not necessarily lead to suicide attempts and are not necessarily linked to suicide, but it is highly likely (Kim, 2006).

2.6. Hopelessness and suicidal ideation

Several studies have demonstrated that hopelessness, a negative expectation for the future, is a cognitive variable closely related to suicidal ideation, suicide attempts, and death from suicide (Kovacs, & Garrison, 1985; Beck & Weishaar, 1990; Goldney, 1981). Hopelessness can lead to a tunnel vision that may arise due to a potential decline in cognitive flexibility of individuals at risk of suicide. As a result, hopelessness can be the most closely related variable to suicide because they can expect negatively about their future and recognize suicide as the only solution (Park, 2014). Studies on the strong relationship between hopelessness and suicide proved that hopelessness explained suicidal ideation 1.3 times more than depression in Beck, Steer, Beck, and Newman (1993), and as a result, hopelessness proved to be the strongest variable predicting suicide-induced death (Kovacs, & Garrison, 1985).

The role of hopelessness in suicide has been argued by numerous theoretical models. Baumeister's Escape Theory 1990 characterizes hopelessness as a dismantled cognitive state, while the Cry of Pain model assumed hopelessness as one of the essential elements of suicide (Williams et al., 1997). Other theories argued that hopelessness falls into the final stage of a series of events that lead to suicidal thoughts and suicidal behavior, and that it is sufficient to see it as a key cause of suicide. For example, in the theory of hopelessness of suicide, the path through which hopeless depression is caused by perceived hopelessness is explained, and one of the desperate depression symptoms is suicide (Cornette et al., 2009). Similarly, the stress vulnerability model stated that hopelessness occurs in the inability to cope with living stress, resulting in suicide (Clum & Febraro, 1994). Previous studies in Korea also report that ignorance predicts various forms of suicide behavior, such as suicidal ideation, suicide attempts, and suicide completion (Yuk, 2002). hopelessness is a variable that directly affects suicidal thoughts (Son, 2009), and in adult studies, hopelessness often leads to suicide, and in adults and the elderly, hopelessness was a variable that predicted suicide better than depression (Kim & Kim, 2008).

2.7. Perceived stress and suicidal ideation

The relationship between perceived stress and suicidal ideation can be understood as a stress vulnerability model. The stress-vulnerability model explains that the results of an individual's genetic and social psychological predisposition and interaction with the environment experienced by the individual are the causes of psychological disorders (Zuckerman, 1999). The stress-vulnerability model is important to understand as an interaction between individual vulnerability factors behind suicide and triggering events, environmental stress that can cause suicide (Silverman, & Felner, 1995). Looking at previous studies of stress and suicidal ideation, Wilson et al. (1995) reported more stress events in adolescents with suicidal thoughts than in the control group, and in the clinical group, depression is a strong predictor of suicidal ideation, but negative life event stress is more affected than depression in general adolescents in the nonclinical group (Menesse, & Yutrzenka, 1990).

In a study by Yoo (2008) on college students, it was found that maladaptive perfectionism partially mediated the relationship between perceived stress and suicidal ideation. In addition, perceived stress among the study variables showed a high correlation with suicidal ideation. Yoo (2011) also reported that maladaptive perfectionism partially mediated the relationship between perceived stress and suicidal ideation.

2.8. Relationship between coronavirus infection-19 (COVID-19) and stress, oblivion, and suicidal thoughts

The COVID-19 pandemic situation can be seen as a multi-dimensional disaster that is a pandemic of biological infectious diseases, as well as socioeconomic ripple, suspension of diplomatic and trade exchanges between countries, and disconnection and solitude between people. Psychological shock, anxiety, increased unemployment in shrinking economic situations, decreased economic income, and disconnection from relationships amplify concerns about suicide risk. The number one cause of death in Korea's 10s, 20s, and 30s and the second cause of death in their 40s and 50s are suicide, and Korea's suicide rate was ranked first among OECD countries for 12 years (Statistics Office, 2018). There is a risk that the triplet of mental health, economic problems, and health problems, which are the causes of high suicide rates in Korea, will increase rapidly due to COVID-19. In June 2020, the provisional suicide rate increased year-on-year for the first time this year (Suicide Prevention Policy Seminar, Post-Corona Era Suicide Prevention (2020, p18-19). The increase in depression due to economic shock after COVID-19 is also a problem.

Most of the reasons for suicide were economic problems and occupational stress. Job Korea, which specialize in employment, conducted a survey of 5,037 adult men and women in March 2020. First of all, 44.7% of the respondents said they were "a little stressed out" when asked how much stress they were worried about COVID-19 infection. 28.9% of the respondents said they were "very stressed." In other words, 73.6% of all respondents said they were "stressed by infectious

diseases." On the other hand, 26.4% of the respondents said they had little stress (22.4%) or "no stress (4.0%)." A survey of 5,294 college students and job seekers on the "stress situation caused by COVID-19" showed that there were many college students and job seekers who were under stress due to the new coronavirus infection (COVID-19).

Among the stress situations experienced by college students and job seekers due to COVID-19, stress from economic difficulties was the highest at 36.7%. Next, difficulties in other employment activities (32.1%) due to the evaporation of the open recruitment season in the first half of the year, stress (27.7%) due to restrictions on outdoor activities such as travel (21.6%), stress (17.5%), vague anxiety (15.2%), and infectious diseases (13.4%). In particular, in the case of college students, stress from postponement of classes due to COVID-19 topped the list with 42.7%, and job seekers had a difference as job stress from evaporation in the first half of the year topped the list with 55.6%. In addition, job seekers often complained of economic difficulties (13.3%P↑) or vague anxiety (8.7%P↑) compared to college students, while college students had relatively high stress due to social activity restrictions (9.5%P↑) or outdoor activity restrictions (8.1%P↑).

According to a study by Lee (2020), 48% of Koreans experience anxiety and depression caused by COVID-19, and the degree increases with age. Of the 1,500 respondents aged 15 or older nationwide, 47.5% felt "some" or "serious" levels of anxiety and depression due to COVID-19. In particular, as the age group increased, the percentage of respondents who said they were anxious and depressed gradually increased. The rate of feeling anxiety and depression was 40.0% in teens, 46.5% in their 30s, and 52.2% in their 50s, which were analyzed to increase with age. According to Yang's study (2020) on coping with negative emotions occurring in the COVID-19 situation in college freshmen, frustration was the highest among the subjects' negative emotions, followed by lethargy, anxiety, and anger. Depending on gender, women were experiencing more anxiety, lethargy, anger, fear, and confusion than men. There were 580 female suicides between March and April 2019, but between March and April this year, the number increased by 97 (16.7%) to 677. The relationship between COVID-19 and depression, lethargy, insomnia, and suicidal ideation can be predicted, and the relationship between COVID-19 and oblivion (Lee, 2020).

2. 9. Research Questions and Hypotheses

The research model is shown in <Figure 1>.

Research Question 1: Is there a significant correlation between COVID-19, perceived stress, hopelessness, and suicidal ideation of college students?

H1: COVID-19, perceived stress, hopelessness, and suicidal ideation of college students will have a significant positive correlation.

Research Question 2: Will hopelessness mediate the effect of perceived stress of college students due to COVID-19 on suicidal ideation?

H1. Perceived stress of college students due to COVID-19 will have a significant effect on hopelessness.

H2. Perceived stress of college students due to COVID-19 will have a significant impact on suicidal ideation.

H3. Perceived stress and hopelessness of college students due to COVID-19 will have a significant effect on suicidal ideation.

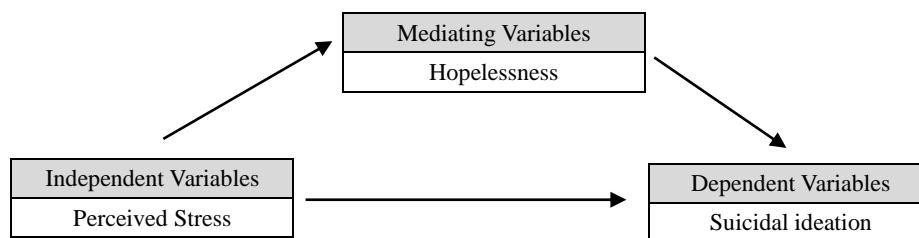


Figure 1: Research model

3. Method

3.1. Subjects

This study conducted an online survey on 103 male and female college students for about three weeks from October 12 to October 28, 2020, using Google Form to examine the relationship between perceived stress and suicidal ideation caused by COVID-19. Online questionnaires were distributed using SNS and university community apps (hereinafter referred to as Every Time). The first number of questionnaires collected was 138, but 35 questionnaires that omitted essential items such as gender, grade, and age, were deleted and statistical analysis was conducted with the remaining 103 questionnaires.

3.2. Assessment Instruments

3.2.1. Perceived stress scale (PSS)

The perceived stress scale (PSS) was a shortened version of the scale developed by Cohen, Kamarck, and Mermelstein (1983) through factor analysis, and in this study, a scale adapted by Lee (2005) was used. This scale measures the degree to which one perceives the situation one experiences in life as stress. The questions consist of questions about how unpredictable, uncontrollable, and excessive burden is felt in everyday life. A total of 10 questions are scored in reverse on the Likert-style 5-point scale, meaning that the higher the total score, the higher the perceived stress level. In this study, the reliability of the tool Cronbach's was .734.

3.2.2. Scale of Hopelessness (BHOP)

The Beck Hopelessness Scale (BHS) developed by Beck et al. (1974) was adapted by Shin, Park, Oh, and Kim (1990) in this study. This scale measures hopelessness with 11 questions (e.g., I can't make my life better, so I'd rather give up) and hope (e.g., I'm hopeful and motivated about my future). It includes nine reverse scoring questions and is rated as 'yes' 1 point and 'no' 0 point. The scores are distributed from 0 to 20, and the higher the score, the higher the sense of hopelessness. This scale classified into a state of 0 to 3 points (normal), 4 to 8 points (mild), 9 to 14 points (moderate), and 15 points or more (severe) according to the range of scores (Beck and Steer, 1988). In this study, the reliability of the tool Cronbach's was .903.

3.2.3. The Scale for Suicidal Ideation (SSI)

The Scale for Suicidal Ideation used in this study was developed by Beck, Kovacs and Weissman (1979), and transformed into a self-reported questionnaire by Park Kwang-bae and Shin (1990). This scale measures the degree of suicidal ideation presenting self-destructive hopes or thoughts. The response to this scale is the 3-point Likert scale (0-2 points). The higher the score, the more people think about suicide. In this study, the reliability of the tool was Cronbach's .776.

3.3. Data analysis method

In this study, the collected questionnaire was analyzed using IBM SPSS 22 after encoding and error review to confirm whether the perceived stress of college students due to COVID-19 (COVID-19) would mediate the effect of suicidal ideation. The analysis method used in this study by research questions and research hypotheses is as follows. Pearson correlation was conducted to find out whether there was a significant correlation between coronavirus infection-19 (COVID-19), perceived stress, hopelessness, and suicidal ideation in college students. Mediated regression analysis was conducted to find out whether hopelessness would mediate the effect of perceived stress of college students on suicidal ideation due to COVID-19.

4. Results

4.1. Demographic characteristics

The gender distribution of respondents was 27 male students (26.2%) and 76 female students (73.8%). The distribution of grades was 37 (35.9%) in the first grade, 16 (15.5%) in the second grade, 25 (24.3%) in the third grade, and 25 (24.3%) in the fourth grade. Table 3 shows the distribution of demographic characteristics of the subjects who responded to the survey (table 1).

Table 1: Results of frequency analysis of subjects

variable		Frequency (percentage %)
gender	male	27(26.2%)
	female	76(73.8%)
	total	103(100%)
grade	1	37(35.9%)
	2	16(15.5%)
	3	25(24.3%)
	4	25(24.3%)
	total	103(100%)
age	18~20	37(35.9%)
	21~25	62(60.2%)
	over 26	4(3.9%)
	total	103(100%)

4.2. Descriptive statistics and correlation analysis of major variables

Prior to verifying each hypothesis in this study, descriptive statistics of major variables are presented in Table 2. The mean of perceived stress scale was 19.05 (SD=4.45), the mean of suicide scale was 6.78 (SD=3.44), and the mean of hopelessness scale was 4.64 (SD=4.37). Pearson correlation analysis was conducted to determine the degree and direction of relevance between the variables before verifying the hypothesis that the perceived stress of college students due to COVID-19 (COVID-19) will be mediated by helplessness. The correlation between suicidal ideation and stress was significant with $r=.251$ ($p<0.05$), and the correlation between suicidal ideation and helplessness was significant as $r=.447$ ($p<0.01$), the correlation between stress and helplessness was significant with $r=.446$ ($p<0.01$). In other words, suicidal ideation, stress, and helplessness were found to have a statistically significant correlation.

Table 2: correlation analysis of major variables

	Stress	suicidal ideation	helplessness
Stress	1		
suicidal ideation	.251*	1	
helplessness	.446**	.447**	1
M	19.05	6.78	4.64
SD	4.45	3.44	4.37
Minimum value	10	1	0
Maximum value	30	20	17

* $p<0.05$, ** $p<0.01$

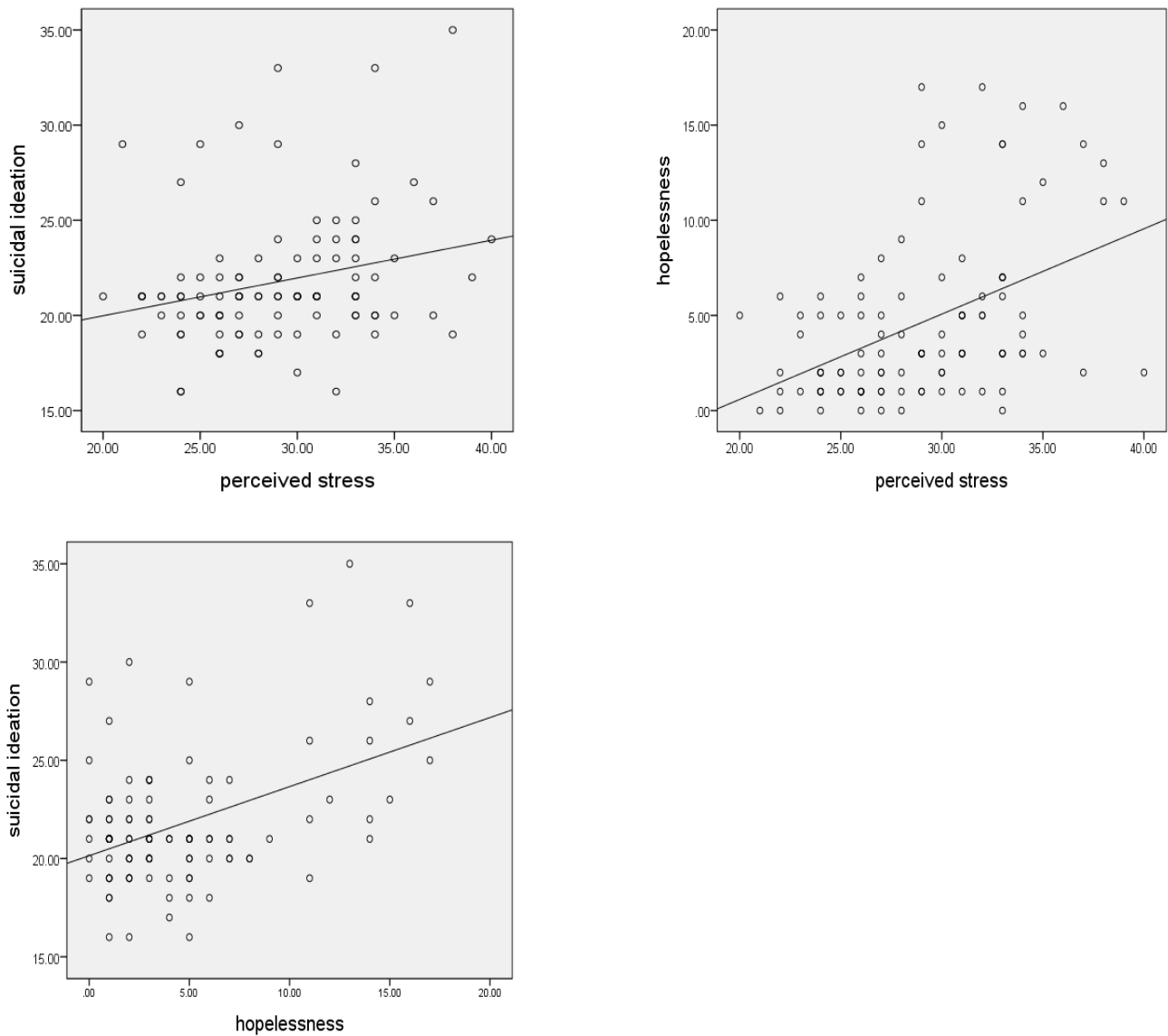


Figure 2: Correlation diagrams of perceived stress, hopelessness, and suicidal ideation

4.3. Analysis of mediating effect

Sequential regression analysis was conducted according to the mediation analysis procedure proposed by Baron and Kenny (1986) to verify the mediating model that hopelessness will mediate the effect of perceived stress caused by COVID-19 on suicidal ideation. As shown in <Table 3>, the influence of perceived stress in COVID-19 situation, an independent variable, on suicidal ideation, a dependent variable, was statistically significant in the first stage ($\beta=0.251, t=2.607, p<0.05$). In the second stage, the influence of perceived stress in COVID-19 situation on hopelessness was also statistically significant ($\beta=0.446, t=5.009, p<0.001$). In addition, the effect of perceived stress as an independent variable in COVID-19 situation, on suicidal ideation was not significant in step 3 ($\beta=0.065, t=.648, p>0.05$), and the influence of hopelessness on the dependent variable was significant ($\beta=0.418, t=4.190, p<0.001$). Therefore, it was found that hopelessness completely mediated the relationship between perceived stress in COVID-19 situation and suicidal ideation.

Table 3: The mediating effect of hopelessness in the relationship between perceived stress in COVID-19 situation and suicidal ideation

	1 stage dependent variable: suicidal ideation			2 stage dependent variable: hopelessness			3 stage dependent variable: suicidal ideation		
	b	β	t	b	β	t	b	β	t
stress	0.199	0.251	2.607*	0.448	0.446	5.009***	0.051	0.065	.648
hopelessness							0.329	0.418	4.190***

*p<.05, ***p<.001

5. Discussion

This study presented and verified a hypothetical model to understand the mediating effect of hopelessness in the relationship between perceived stress and suicidal ideation of college students resulted from COVID-19 situation. To this end, the main concepts were selected based on previous studies and a hypothetical model was constructed. The conclusions of this analysis process and discussion are summarized as follows.

As a result of the study, it was found that COVID-19 correlated with perceived stress, hopelessness, and suicidal ideation of college students.

It was found that hopelessness completely mediated between perceived stress and suicidal thoughts of college students, which is consistent with previous studies. Several studies have demonstrated that hopelessness, that is, a negative expectation for the future, is a cognitive variable closely related to suicidal ideations, suicide attempts, and death from suicide (Beck & Weishaar, 1990). And a study by Newman (1993) proved that hopelessness explained suicidal ideation 1.3 times more than depression. Stress affects suicidal ideations only when there is a sense of hopelessness.

This study is meaningful in that it confirmed relationship between the perceived stress, hopelessness, and suicidal ideations in college students due to COVID-19, reflecting the new situation of the times. To generalize the research results, follow-up studies should be conducted by supplementing the lack of sampling and the fact that surveys in an uncontrolled environment could have caused insincere responses from respondents.

There is something to consider in approaching the suicide problem caused by the current disaster situation of COVID-19. First, disasters vary depending on their nature and response, and there are wave changes over time, requiring long-term analysis. In addition to the short-term increase in suicide rates due to the current disaster situation caused by COVID-19, close tracking of the long-term effects of unemployment, solitude, and chronic diseases will be necessary.

Looking at the situation during the 1997 financial crisis, the suicide mortality rate exceeded the traffic accident mortality rate for the first time in Korea, and since then, the suicide rate has continued to rise rapidly even during the 2003 credit card crisis and the 2008 economic crisis. COVID-19 is also causing enormous economic losses and mass-producing unemployed people, which is expected to lead to an economic crisis as much as the 1997 financial crisis (Lee, 2020). Considering these past experiences, it can be expected that the perceived stress of college students through hopelessness after COVID-19 will have a great influence on suicide accidents and suicide attempts. Therefore, the following policy implications and practical implications are presented to prevent this.

According to a study by Horesh and Brown (2020), coronavirus will worsen people's mental health disorders and cause new stress-related disorders. Therefore, mental health researchers, clinicians, and people working in trauma-related fields should find ways to reduce the incidence of coronavirus-related trauma stress and prevent its effects. In addition, the work of developing intervention methods for coronavirus-related stress and confirming their effects should be carried out quickly. Second, there is a need to further strengthen the early detection and referral linkage system for high-risk suicide groups. Third, it is necessary to expand the psychological vaccine program to improve the resilience of the public. Trauma can be experienced by anyone, but since there are individual differences in resilience, it is necessary to strengthen the psychological vaccine program for each subject considering resilience. Fourth, complementary measures should be accompanied at the same time for the effects of social isolation and loneliness incidental to social distancing due to COVID-19, which is currently being emphasized as a quarantine strategy. Special attention is needed in that these factors are recognized as affecting suicide.

Reference

- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological review*, 96(2), 358.
- Adler, A. (1964). *Problems of neurosis*. Harper Torchbooks.
- Bae, E. K. (2015). Effect of stress and oblivion on suicide accidents and suicide attempts: Mediated moderating effect of life purpose. (Unpublished Doctoral Dissertation). Ajou University, Suwon.
- Bae, E. K., & Lee, M. G. (2018). Effect of stress and oblivion on suicide accidents and suicide attempts. *Journal of the Korean Psychological Society: Clinical Psychological Research and Practice*, 4(1), 187-209.
- Beck, A. T., Kovacs, M., & Weissman, A. (1979). Assessment of suicidal intention: the Scale for Suicide Ideation. *Journal of consulting and clinical psychology*, 47(2), 343.
- Beck, A. T., & Weishaar, M. E. (1990). Suicide risk assessment and prediction. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*.
- Beck, A. T., Steer, R. A., Beck, J. S., & Newman, C. F. (1993). Hopelessness, depression, suicidal ideation, and clinical diagnosis of depression. *Suicide and Life-Threatening Behavior*, 23(2), 139-145.
- Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: the hopelessness scale. *Journal of consulting and clinical psychology*, 42(6), 861.
- Borges, G., Nock, M. K., Abad, J. M. H., Hwang, I., Sampson, N. A., Alonso, J., & Kessler, R. C. (2010). Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization World Mental Health Surveys. *The Journal of clinical psychiatry*, 71(12), 1617-1628.
- Centers for Disease Control and Prevention, CDC. (2021. Juli). Retrieved from <https://www.cdc.gov/coronavirus/2019-ncov/global-covid-19/index.html>
- Central Disaster Management Headquarters. (2021. October). Coronavirus (COVID-19), Republic of Korea. Cases of COVID-19 in Korea. Retrieved from http://ncov.mohw.go.kr/en/bdBoardList.do?brdId=16&brdGubun=161&dataGubun=&ncvContSeq=&contSeq=&board_id=
- Cho, S. A. (2018). A pastoral counseling study through group counseling of Nth generation experiencing homelessness. *Yonsei Counseling Coaching Study*, 10, 107-127.
- Choi, J. Y. (2020). The effect of social risk from COVID-19 on consumer sentiment and HMR purchase patterns. (Unpublished master's thesis), Yonsei University, Seoul.
- Clum, G. A., & Febraro, G. A. (1994). Stress, social support, and problem-solving appraisal/skills: Prediction of suicide severity within a college sample. *Journal of Psychopathology and Behavioral Assessment*, 16(1), 69-83.
- Cohen, S., & Williamson, G. M. (1991). Stress and infectious disease in humans. *Psychological bulletin*, 109(1), 5.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of health and social behavior*, 385-396.
- Cornette, M. M., Strauman, T. J., Abramson, L. Y., & Busch, A. M. (2009). Self-discrepancy and suicidal ideation. *Cognition and Emotion*, 23(3), 504-527.
- Durkheim, E. (1987). *La división del trabajo social* (Vol. 39). Ediciones Akal.
- Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of personality and social psychology*, 50(3), 571.
- Freud, S. (1955). A difficulty in the path of psycho-analysis. In *The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume XVII (1917-1919): An Infantile Neurosis and Other Works* (pp. 135-144).
- Goldney, R. D. (1981). Attempted suicide in young women: Correlates of lethality. *The British Journal of Psychiatry*, 139(5), 382-390.
- Ha, J. (2011). Mediation effect of higher perception of anxiety in the relationship between perceived stress, anxiety, and problematic Internet use. (Unpublished Master's thesis), Ewha Womans University, Seoul.
- Hong, S. H. (2020). The effect of COVID-19 on the mental health of Americans.
- Horesh, D., & Brown, A. D. (2020). Traumatic stress in the age of COVID-19: A call to close critical gaps and adapt to new realities. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(4), 331.
- Ji, Y. O. (2018). Analysis of the structural relationship between job stress, cognitive flexibility, social support, depression, and suicide accidents of college students. (Unpublished Doctoral dissertation). Dong-A University, Daegu.
- Jobkorea (2020.05.04). What's the biggest stress you're experiencing from COVID-19? Retrieved from https://www.jobkorea.co.kr/goodjob/tip/view?News_No=16692

- JoongAng newspaper (2020.09.04). The extreme choice of sisters operating 'Norae Bar'... In his will, he wrote about the difficulties of Corona. Retrieved from <https://www.joongang.co.kr/article/23864870#home>.
- Jung, C. G. (1923). On The Relation Of Analytical Psychology To Poetic Art 1. *British Journal of Medical Psychology*, 3(3), 213-231.
- Jung, H. S. (2020). Effect of physical health and quality of life of college students in single-person households on depression and suicide accidents. (Unpublished Master's thesis). Korea University, Seoul.
- Kim, J. H. (1987) Effect on depression of perceived stress, cognitive set, and coping method. (Unpublished Doctoral Dissertation). Seoul National University, Seoul.
- Kim, J. Y. (2012). Suicide-related behaviors among college students and suicide prevention. *Journal of Digital Convergence*, 10(11), 525-533.
- Korea Institute of Finance (2020). Report on the COVID-19 crisis and the recent increase in demand for stock investment. 1-5.
- Kovacs, M., & Garrison, B. (1985). Hopelessness and eventual suicide: A 10-year prospective study of patients hospitalized with suicidal ideation. *American journal of Psychiatry*, 142(5), 559-563.
- Kuo, W. H., Gallo, J. J., & Eaton, W. W. (2004). Hopelessness, depression, substance disorder, and suicidality. *Social psychiatry and psychiatric epidemiology*, 39(6), 497-501.
- Larsen, R. J. (2000). Toward a science of mood regulation. *Psychological inquiry*, 11(3), 129-141.
- Lazarus, R. S. (1974). Psychological stress and coping in adaptation and illness. *The International journal of psychiatry in medicine*, 5(4), 321-333.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company.
- Lee, B. Y. (2020). COVID-19, the development situation, and future tasks.
- Lee, E. H. (2020). COVID-19 generation, how is your mental health? *Issue & diagnosis*, 1-25.
- Lee, H. J. (2019). Mediated effect of perceived control in the relationship between perceived stress and premenstrual syndrome. (Unpublished Master's thesis), Daegu University, Daegu.
- Lee, H. J., & Kim, M. H. (2007). A study on the relationship between self-identity, ignorance, depression, and suicide accidents of college students. *Research on Adolescents*, 14(3), 243-264.
- Lee Jeong-eun, & Lee Min-gyu (2005). Effect of self-complexity and self-efficacy on depression and perceived stress. *Data Collection of Academic Conferences of the Korean Psychological Association*, (1), 422-423.
- McQuay, H. J., Moore, R. A., Eccleston, C., Morley, S., & Williams, A. C. (1997). Systematic review of outpatient services for chronic pain control. *Health technology assessment (Winchester, England)*, 1(6), i-iv.
- Meneese, W. B., & Yutzenka, B. A. (1990). Correlates of suicidal ideation among rural adolescents. *Suicide and Life-Threatening Behavior*, 20(3), 206-212.
- Oh, H. J. (2013). Relationship between perceived stress, oblivion, depression, and suicidal thoughts. (Unpublished master's thesis). Kyungpook National University, Daegu.
- Park, K. B., & Shin, M. S. (1990) High school student's college entrance exam goal and suicidal thoughts. *Korean Journal of Clinical Psychology*, 9(1), 20-32.
- Park, J. B. (2020). Policy Discussion: Coronavirus Infectious Disease 2019 and Health Policy.
- Park, S. E. (2019). Characteristics, propagation, and clinical manifestations of the virus (SARS-CoV-2) of COVID-19. *Pediatric Infection & Vaccine*, 27.
- Reynolds, W. M. (1991). Psychometric characteristics of the Adult Suicidal Ideation Questionnaire in college students. *Journal of personality assessment*, 56(2), 289-307.
- Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American psychologist*, 41(7), 813.
- Selye, H. (1976). *The stress of life*. New York: McGraw-Hill.
- Shin, M. S., Park, K. B., Oh, K. J., & Kim J. S. (1990) Study on the Suicide propensity of high school students: Analysis of the structural relationship between depressed and desperate suicide. *Korean Journal of Clinical Psychology*, 9(1), 1-19.
- Silverman, M. M., & Felner, R. D. (1995). The place of suicide prevention in the spectrum of intervention: Definitions of critical terms and constructs. *Suicide and Life-Threatening Behavior*, 25(1), 70-81.
- Skaggs, C. D., Prather, H., Gross, G., George, J. W., Thompson, P. A., & Nelson, D. M. (2007). Back and pelvic pain in an underserved United States pregnant population: a preliminary descriptive survey. *Journal of manipulative and physiological therapeutics*, 30(2), 130-134.
- Son, H. N. (2020). Difficulties of the daycare center director due to COVID-19 and countermeasures against COVID-19. (Unpublished Master's thesis), Bae Jae University, Seoul.

- Statistics Office (2018). Survey on Suicide in Korea.
- Suicide Prevention Policy Seminar Suicide Prevention (2020). In the era of uncertainty, cooperation for suicide prevention, suicide prevention policy seminar in the post-COVID-19 era, suicide prevention, p18-p19.
- Traumatic stress in the age of COVID-19: A call to close critical gaps and adapt to new realities. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(4), 331-335.
- Weinstein, N., Brown, K. W., & Ryan, R. M. (2009). A multi-method examination of the effects of mindfulness on stress attribution, coping, and emotional well-being. *Journal of research in personality*, 43(3), 374-385.
- Williams, D. R., Yu, Y., Jackson, J. S., & Anderson, N. B. (1997). Racial differences in physical and mental health: Socio-economic status, stress, and discrimination. *Journal of health psychology*, 2(3), 335-351.
- Wilson, K. G., Stelzer, J., Bergman, J. N., Kral, M. J., Inayatullah, M., & Elliott, C. A. (1995). Problem solving, stress, and coping in adolescent suicide attempts. *Suicide and Life-Threatening Behavior*, 25(2), 241-252.
- Yang, H. J. (2020). Differences in depression and psychological emotions according to the degree of self-elasticity of college freshmen in the COVID-19 situation. *The Journal of the Convergence on Culture Technology (JCCT)*, 6(3), 75-81.
- Yang, S. M. (2019). A study on psychosocial factors affecting suicide in early adults. (Unpublished master's thesis), Seoul Women's University, Seoul.
- Yoo, S. M. (2008). Relationship between perceived stress, maladaptive perfectionism, and suicidal thoughts.
- Zuckerman, M. (1999). Diathesis-stress models. In M. Zuckerman, *Vulnerability to psychopathology: A biosocial model* (pp. 3-23). American Psychological Association. <https://doi.org/10.1037/10316-001>