

Effect of Subjective Economic Status During the COVID-19 Pandemic on Depressive Symptoms and Suicidal Ideation Among South Korean Adolescents

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Purpose: This study identified the relationships between perceived household economic status and household economic downturn due to COVID-19 and adolescent depressive symptoms and suicidal ideation.

Methods: Participants for this study were extracted from the 13th Korea Youth Risk Behavior Web-Based Survey, conducted from August to November 2020. The participants comprised 54,948 middle and high school students selected by stratified random cluster sampling.

Results: The prevalence rates of depressive symptoms and suicidal ideation were 25.2% and 10.9%, respectively. Multivariate logistic regression analysis showed that lower perceived household economic status significantly predicted higher prevalence of depressive symptoms and suicidal ideation. Participants who perceived that their household economic status had declined because of COVID-19 were more likely to have experienced depression and suicidal ideation. These results were similar regardless of the participants' perceptions of household economic status.

Conclusion: This study found that in the ongoing pandemic, there is a need for an active mental health promotion program for adolescents from low-income households, especially those who experienced a recent decline in the household economy.

Keywords: COVID-19, adolescent, depression, suicidal ideation, economic condition

Introduction

Since South Korea confirmed its first case of COVID-19 on January 20, 2020, the number of new cases has been steadily increasing. As of June 24, 2021, the cumulative number of confirmed cases and deaths in the country is 153,155 and 2008, respectively.¹ The continuance of the COVID-19 pandemic has resulted in many negative consequences for mental health, such as depression and stress.² The National Mental Health Survey of 1014 adults aged 19–70 years in Korea during the COVID-19 pandemic found that approximately 20% of the respondents were at moderate or higher risk of anxiety, and 18% were in a moderate or higher risk group for depression.³ Furthermore, according to a previous study⁴ that investigated the mental health of college freshmen in the context of COVID-19, 36.8% experienced mild depressive symptoms due to the pandemic, and 10.0% experienced severe depression. The COVID-19 pandemic has been reported to adversely affect the

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mental health of adults as well as adolescents. In a survey of 92 teenagers aged 9–24 years,⁵ 59.8% answered that they felt anxious and worried about COVID-19. Although adolescents have a lower COVID-19 infection rate than adults, they may be vulnerable to social and psychological stress caused by COVID-19 due to their developmental characteristics. Previous studies conducted in various countries^{6–12} reported that COVID-19 negatively affects symptoms of stress, depression, anxiety, and post-traumatic stress syndrome (PTSD) in adolescents.

The Korean government is trying to prevent the spread of COVID-19 through social distancing, implementing and strengthening quarantine rules, operation of screening clinics, quarantine measures for patients, and mandatory wearing of masks.^{13,14} However, policies such as social distancing have affected all areas of the economy, which has led to a gradual decline in investment and consumption, resulting in an overall economic downturn.¹⁵ According to a previous study in Korea¹⁶ based on data on domestic population movement and sales of small businesses after the COVID-19 pandemic, sales of local small business establishments decreased with the decreased movement of people to avoid COVID-19 infection. It can be inferred that there have been many job losses due to COVID-19 in Korea, which could result in declining household economy. In a previous study,¹⁷ more than 80% of adult respondents responded that COVID-19 had an impact on their home economy, and approximately 30% reported severe impact. These survey results show that Korean adults perceive COVID-19 as having a serious impact not only on the national economy, but also on the household economy. A previous study¹⁸ reported that parents' economic concerns due to COVID-19 are associated with adverse outcomes on adolescents' mental health. Stressors such as economic downturn and family financial loss can have more problematic and enduring effects on adolescents than the COVID-19 infection itself.¹⁹ In many previous studies, adolescents with low socioeconomic levels were more likely to have mental health problems, such as depression and anxiety, in the context of the COVID-19 pandemic.^{20,21} However, evidence regarding socioeconomic status and adolescent's mental health in South Korea is scarce. Previous studies^{22–24} reported that subjective economic status is associated with adolescent mental health. Furthermore, it was found that subjective household economic status, rather than objective measures of socioeconomic status, is associated with depressive symptoms and suicidal ideation among adolescents.²³

Therefore, the purpose of this study was to examine the relationships between subjective household economic status and financial difficulties during COVID-19 and adolescent depressive symptoms and suicidal ideation in Korean adolescents, using nationally representative data.

Materials and Methods

Data Sources and Samples

We drew samples from the 16th Korea Youth Risk Behavior Web-based Survey (KYRBS) conducted in 2020. The KYRBS was established in 2005 by the Korean Centers for Disease Control and Prevention. It is an ongoing national cross-sectional survey that assesses health-risk behaviors among middle- and high-school students and provides data for the development and evaluation of school health policies and programs in South Korea.²⁵

Data for this study were collected between August and November 2020 using stratified cluster sampling. At that time, due to the second wave of COVID-19 (13 August – 19 September) the Korean government upgraded the social distancing level and social activity was reduced sharply.²⁶ Online and offline classes were conducted in middle- and high-schools.

The study population was stratified by local districts (considering city size, number of students, and number of residents) and school level (middle school, general high school, or specialized high school). Students from 400 middle schools and 400 high schools were selected by proportional sampling using a matched study population. Unique identification numbers were assigned to the students by classroom teachers, and they accessed the survey webpage using their ID numbers to guarantee anonymity. In 2020, 57,925 students (grades 7–12, aged 13–18 years) from 400 middle and 400 high schools participated. Among the 57,925 students, 54,948 students from 793 schools responded to the survey. The response rate was 94.9%.

Measurements

The dependent variables in this study were depressive symptoms and suicidal ideation. Depressive symptoms and suicidal ideation were examined by the following questions: “During the past year, have you ever felt so sad or hopeless almost every day for at least 2 weeks in a row that you stopped doing some usual activities?” and “During the past year, have you ever seriously thought of

committing suicide?” The participants responded to each question with “yes” or “no.”

We employed two indices of subjective household economic status as independent variables: perception of the current economic status of households, and increasing difficulty with the household economy than before, due to COVID-19. The perception of current economic status was measured using the question “What do you perceive as your household economic status.” The response options were high, mid-high, middle, mid-low, and low. To assess perceptions of difficulty in the household economy due to COVID-19 related changes, respondents were asked if they thought that their household’s economic status has become more difficult than before due to COVID-19. The responses were scored from one to four, where 1 denoted “not at all” and 4 denoted “very much.”

According to a review^{13,27,28} of factors related to depressive symptoms and suicidal ideation in adolescents, we considered sex, school grade, self-rated academic performance, cohabitation with family, subjective health status, smartphone dependency, current alcohol consumption, and current smoking as covariates. Self-rated academic performance was measured through responses to the question: “During the past year, how was your academic performance?” The response options were high, mid-high, middle, mid-low, and low. Cohabitation with family was measured by asking participants to specify whether they lived with family, relatives, dormitory, or any other facility. The participants responded with yes or no. Subjective health status was measured with the question, “How would you rate your health in general?” The response options were “very good,” “good,” “fair,” “bad,” and “very bad.” Smartphone dependency was measured using a modified version of smartphone dependency self-diagnosis scale originally developed by the National Information Society Agency.²⁹ The scale is composed of 10 questions that are classified into salience, self-control failure, and serious consequences categories. Each item was scored as either 1 (strongly disagree), 2 (disagree), 3 (agree), or 4 (strongly agree) with a maximum total score of 40. A score of 23 or higher was categorized as denoting a person at potentially high-risk of smartphone dependency. Internal consistency reliability was high, as evidenced by a Cronbach’s alpha value of 0.915. Current alcohol consumption was evaluated by asking, “In the last 30 days, on how many days have you consumed more than one glass of alcohol?” The response options were “none,” “1–2 days per month,” “3–5 days per month,” “6–9 days per month,” “10–19 days

per month,” “20–29 days per month,” and “everyday.” Based on their responses, participants were grouped into current drinkers (1 day per month or over) and nondrinkers. Current smoking status was evaluated by asking, “In the last month, on how many days have you smoked more than one cigarette?” The response options were “none,” “1–2 days per month,” “3–5 days per month,” “6–9 days per month,” “10–19 days per month,” “20–29 days per month,” and “everyday.” The respondents were grouped into current smokers based on their answers (1 day per month or over) and nonsmokers.

Statistical Analysis

Since a complex sampling procedure was applied to KYRBS data, stratified, clustered, and weighted variables were included in the analysis. Chi-square tests were performed to determine whether depressive symptoms and suicidal ideation were based on subjective household economic status. The association between subjective household economic status and dependent variables adjusted for covariates was analyzed using a complex multiple logistic regression. Separate multiple logistic regression analysis was performed based on the perception of the current household economic status. In multiple logistic regressions, odds ratios (ORs) and confidence intervals (95% CIs) were calculated. All statistical analyses were conducted using IBM SPSS version 26.0 (IBM Corporation, Armonk, NY, USA), and two-tailed p-values less than 0.05, were considered statistically significant.

Results

Descriptive Statistics

Table 1 shows the general characteristics and subjective household economic status of the participants of this study. Of the 54,948 participants, 51.9% were males. Approximately 49.7% of the students were middle school students from grades 7–9. About 10% of the students responded that their academic performance was low, while 12.2% responded that their academic performance was high. Over 96% of the participants reported that they lived with their families. Less than 8% of the adolescents rated their health as bad or very bad. Among the total participants, approximately one quarter were at high risk of smartphone dependency. Current drinkers and smokers accounted for 10.7% and 4.4% of the participants, respectively. Approximately 2% of the adolescents responded that their household economic status was low, while

Table 1 General Characteristics and Subjective Household Economic Status of Korean Adolescents (N=54,948)

Characteristics	N (Weighted %)
Sex	
Male	28,353 (51.9)
Female	26,595 (48.1)
School grade	
7th (Middle school)	10,005 (17.9)
8th (Middle school)	9564 (16.2)
9th (Middle school)	9392 (15.6)
10th (High school)	8907 (16.9)
11th (High school)	8907 (17.0)
12th (High school)	8173 (16.5)
Self-rated academic performance	
High	6736 (12.2)
Mid-high	13,410 (24.6)
Middle	16,585 (30.1)
Mid-low	12,684 (23.0)
Low	5533 (10.0)
Cohabitation with family	
Yes	52,332 (96.2)
No	2616 (3.8)
Subjective health status	
Very good	15,150 (27.2)
Good	23,294 (42.4)
Fair	12,342 (22.6)
Bad	3891 (7.2)
Very bad	271 (0.5)
High risk of smartphone dependency	
Yes	13,775 (25.5)
No	41,173 (74.5)
Current alcohol consumption	
Yes	5892 (10.7)
No	49,056 (89.3)
Current smoking	
Yes	2470 (4.4)
No	52,478 (95.6)
Perception of current household economic status	
High	6039 (11.2)
Mid-high	15,300 (28.6)
Middle	26,397 (47.5)
Mid-low	5937 (10.4)
Low	1275 (2.2)
Perception of deteriorating household economy compared to before the COVID-19 pandemic	
Not at all	16,268 (30.1)
Slightly	24,841 (39.9)
Moderately	13,583 (24.2)
Very much	3256 (5.8)

11.2% of the adolescents responded that their household economic status was high. A total of 5.8% of the students responded that the household economic condition of their families had worsened very much due to COVID-19, and 24.2% of adolescents responded that it had deteriorated moderately. In contrast, 30.1% of the participants reported that their household economic status had not changed or was better than the condition before the pandemic.

Prevalence of Depressive Symptoms and Suicidal Ideation

The prevalence rates of depressive symptoms and suicidal ideation were 25.2% and 10.9%, respectively. Table 2 shows the percentage distribution of depressive symptoms and suicidal ideation according to the perception of current household economic status and perception of the household economy worsening due to COVID-19. Low subjective household economic status was significantly related to a higher prevalence of depressive symptoms and suicidal ideation. Among adolescents who perceived their household economic status as low, the prevalence of depressive symptoms and suicidal ideation was 42.8% and 24.2%, respectively. In contrast, the respective values among participants who perceived their current household economic status as high were 22.3% and 8.7%. Among adolescents who perceived their household economic status to be worse than before COVID-19, the prevalence of depressive symptoms and suicidal ideation was 37.6% and 19.2%, respectively. However, percentages of participants who perceived that their household economic status did not change or was better than before COVID-19, were 21.3% and 8.7%, respectively.

Association Between Subjective Economic Status During the COVID-19 Pandemic and Depressive Symptoms and Suicidal Ideation

Table 3 shows the multiple logistic regression results regarding the relationship between subjective household economic status and depressive symptoms and suicidal ideation, adjusted by covariates. Low perceived current household economic status was significantly associated with a higher prevalence of depressive symptoms (OR=1.35, 95% CI=1.17–1.55) and suicidal ideation (OR=1.76, 95% CI=1.47–2.10). Similarly, worsening of the household economy during the COVID-19 pandemic was significantly associated with a higher prevalence of

Table 2 Distribution of Depressive Symptoms and Suicidal Ideation According to Subjective Household Economic Status (N=54,948)

	Depressive Symptoms		Suicidal Ideation	
	Weighted %	χ^2	Weighted %	χ^2
Perception of current household economic status				
High	22.3	443.02***	8.7	503.58***
Mid-high	23.6		9.8	
Middle	24.3		10.1	
Mid-low	33.0		16.9	
Low	42.8		24.2	
Perception of deteriorating household economy compared to before the COVID-19 pandemic				
Not at all	21.3	551.42***	8.7	376.51***
Slightly	23.7		10.1	
Moderately	29.5		12.9	
Very much	37.6		19.2	

Note: *** $p < 0.001$.

Table 3 Adjusted Odds Ratio for Depressive Symptoms and Suicidal Ideation Among Korean Adolescents (N=54,948)

	Depressive Symptoms OR [95% CI]	Suicidal Ideation OR [95% CI]
Perception of current household economic status		
High	1.00	1.000
Mid-high	0.94 [0.87–1.02]	1.04 [0.93–1.16]
Middle	0.83 [0.77–0.90] ***	0.94 [0.84–1.05]
Mid-low	1.02 [0.92–1.12]	1.34 [1.18–1.52] ***
Low	1.35 [1.17–1.55] ***	1.76 [1.47–2.10] ***
Perception of deteriorating household economy compared to before the COVID-19 pandemic		
Not at all	1.00	1.00
Slightly	1.07 [1.01–1.13] *	1.05 [0.97–1.13]
Moderately	1.34 [1.26–1.43] ***	1.24 [1.15–1.35] ***
Very much	1.80 [1.65–1.97] ***	1.75 [1.56–1.97] ***

Notes: Adjusted for sex, school grade, self-rated academic performance, cohabitation with family, subjective health status, high risk of smartphone dependency, current alcohol consumption, current smoking. * $p < 0.05$, *** $p < 0.001$.

depressive symptoms (in case of very much: OR=1.80, 95% CI=1.65–1.97, in case of moderately: OR=1.34, 95% CI=1.26–1.43) and suicidal ideation (in case of very much: OR=1.75, 95% CI=1.56–1.97, in case of moderately: OR=1.24, 95% CI=1.15–1.35).

The results of the multiple logistic regression based on the level of perceived current household economic status are shown in Table 4. Regardless of the level of perceived current household economic status, worsening of the household economy during the COVID-19 pandemic was significantly associated with a higher prevalence of depressive symptoms. Perceived current household

economic status, except for high perceived status, was considered worse than before the COVID-19 pandemic and was significantly associated with a higher prevalence of suicidal ideation.

Discussion

Since this study analyzed the relationship between the COVID-19 pandemic and mental health of Korean adolescents using a nationwide sample, the results are likely highly generalizable compared to studies conducted in other countries. Although several previous studies used data at the beginning of the COVID-19 pandemic, this

Table 4 Adjusted Odds Ratio for Depressive Symptoms and Suicidal Ideation Among Korean Adolescents by Perceived Current Household Economic Status (N=54,948)

	Depressive Symptoms OR [95% CI]					Suicidal Ideation OR [95% CI]				
	High	Mid-High	Middle	Mid-Low	Low	High	Mid-High	Middle	Mid-Low	Low
Perception of deteriorating household economy compared to before the COVID-19 pandemic										
Not at all	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Slightly	1.17 [0.75–1.83]	1.05 [0.85–1.29]	1.08 [1.00–1.17]	1.08 [0.98–1.18]	1.03 [0.88–1.19]	1.46 [0.82–2.58]	0.98 [0.73–1.31]	1.11 [0.99–1.25]	1.03 [0.91–1.17]	0.92 [0.72–1.17]
Moderately	1.23 [0.80–1.90]	1.35 [1.10–1.64]**	1.37 [1.25–1.50]***	1.39 [1.25–1.54]***	1.05 [0.87–1.26]	0.98 [0.55–1.75]	1.27 [0.97–1.66]	1.35 [1.19–1.53]***	1.20 [1.03–1.39]*	0.94 [0.68–1.30]
Very much	1.78 [1.14–2.76]*	1.41 [1.12–1.77]**	2.07 [1.80–2.38]***	2.01 [1.34–2.47]***	1.76 [1.37–2.26]***	1.55 [0.90–2.67]	1.73 [1.29–2.31]***	1.85 [1.51–2.26]***	1.82 [1.40–2.38]***	1.75 [1.23–2.47]***

Notes: Adjusted for sex, school grade, self-rated academic performance, cohabitation with family, subjective health status, high risk of smartphone dependency, current alcohol consumption, current smoking. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

study used data from surveys conducted from August to November 2020; this enables the mid-pandemic situation to be better understood.

In this study, the prevalence rate of depression among Korean adolescents was 25.2%, and the prevalence rate of suicidal ideation was 10.9%; these values are lower than the KYBRS data collected in 2019 (28.2% and 13.1%, respectively). However, the prevalence of depressive symptoms and suicidal ideation among the participants continued to increase from 2016 to 2019.³⁰ These results were related to the timing of the survey. From 2016 to 2019, the survey was conducted around June during the semester, and from August to November in 2020. Summer vacation was included, which affected the survey results. Moreover, the period of August to November is likely influenced by adaptation to changes in life patterns due to the COVID-19 pandemic. The prevalence of depressive symptoms reported in previous studies ranged from 19% to 43%. The results of the present study are consistent with such previous studies.

This study found that the prevalence of depressive symptoms and suicidal ideation were high after adjusting for covariates, when household economic status was evaluated as low. The findings of this study confirm increasing concern that the COVID-19 pandemic has negatively affected the mental health of adolescents of lower

socioeconomic status.^{10,21,31,32} This finding is similar to previous Korean studies conducted before the onset of COVID-19.^{23,33–35}

The key finding in this study was the significant relationship between the perception of worsening of the household economy during COVID-19 and adolescent mental health. That is, when the household economic condition was judged as worse than before COVID-19, the odds of adolescents of depressive symptoms and suicidal ideation were significantly higher, consistent with previous studies.³⁶ Previous studies have suggested several reasons for the significant relationship between household economic recession and the mental health of adolescents. Reduced economic status of the family constitutes a risk for children's mental health through increased economic pressure and consequent negative changes in parental mental health, marital interactions, and parenting quality.³⁷ Additionally, when parents convey that the status of their home economy has deteriorated, their children may worry about family finances. Adolescents' worries about family finances are significantly associated with their mental health problems, including depression.^{38,39} While economic recession may reduce time burdens on parents, a study found that spending more time with children may in fact negatively affect children.³⁹ Previous studies⁴⁰ have reported that the economic difficulties

caused by COVID-19 cause problems with parental mental health and have adverse effects on children. In addition, the mental health of adolescents in households whose economic level has declined is negatively affected by concerns about school closing and learning less due to COVID-19,^{41,42} along with concerns about the home economy. A study⁴³ showed that more adolescents were exposed to domestic violence during versus before the COVID-19 pandemic. The results of these previous studies indicate that a worsening home economy due to COVID-19 adversely affects the mental health of adolescents. However, these results appeared not only in the low-income group, but also in the high- and mid-high group. A previous study³⁷ suggested that higher social status does not protect parents from personal stress, marital disputes, and compromised parenting or their children from problems when the family economy collapses. Our findings can be interpreted more clearly in this context. The economic crisis brought by the pandemic could have long-term negative consequences, leading to increased family conflict, abuse, suicidal tendencies, and substance abuse.⁴⁴ In coping with the COVID-19 pandemic, governments, public health agencies, and schools need to consider the impact of this unusual situation on adolescents by implementing mitigation measures and making investments to reduce the damages.⁴³

Limitations, Implications, and Suggestions for Future Research

Our study has some limitations. First, in this study, there was a limit to the selection of variables as KYBRS data secondary data were used. Variables related to the parents and family environment of adolescents, such as parents' educational background and nationality, were not included in the analysis because of the large amount of missing data. Previous studies have reported that family relationships and community bonds play an essential role in adolescent mental health outcomes during an epidemic, and the existence of carers can protect them from psychological distress.^{3,45} Moreover, depressive symptoms and suicidal ideation were assessed using only one item each, which represents a limitation in the information available. Second, since this is a cross-sectional study, it was impossible to identify causal relationships. Moreover, there was a time gap between the assessments of respondents' subjective household economic status, depressive symptoms, and suicidal ideation.

We suggest that future research should consider additional factors that might influence the mental health of adolescents, such as parent-adolescent relationships and social support. Furthermore, longitudinal studies are needed as the COVID-19 pandemic have a long-term impact on adolescents' mental health.

Conclusion

The results of this study indicated a high prevalence of middle and high school students in Korea from households with low economic status during the COVID-19 pandemic. Furthermore, students who perceived a decline in their household economic status due to COVID-19 were relatively susceptible to mental health problems. Access to mental health services is needed to cope with increased demand in times of economic recession. Governments, health authorities, communities, organizations, schools, and family members should work closely and organically to implement mental health promotion programs. Furthermore, vulnerable groups are generally not easy to discover; thus, continuous cooperation of the aforementioned groups is required to achieve positive results regarding mental health.

Ethical Approval

This study was approved by Sangji University Institutional Review Board (approval number: 1040782-210514-HR-08-81).

Disclosure

The authors report no conflicts of interest associated with this work.

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