Association Between Changes in Family Life Due to COVID-19 and Depressive Mood and Stress Perception

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Abstract
Coronavirus disease 2019 (COVID-19) is a new infectious disease that has had a significant impact on daily life. This study investigated the effect of changes in family life due to COVID-19 on depressive mood and stress perception. We used data from the “Survey on changes in family life due to COVID-19” in Korea. The final study population comprised 1500 adults with children aged ≤19 years. Of the total respondents, 59.3% responded that depressive mood and stress had increased due to COVID-19. However, among them, 46.6% did not attempt to resolve or could not find a way to resolve their depressive mood and stress. In multiple logistic regression analyses, a decrease in household income and increased household expenditure due to COVID-19 were significantly associated with an increased risk of depressive mood and stress perception. Depressive mood and stress were significantly higher in respondents who had experienced family conflicts. These results could be used to assess changes in family life and manage mental health when a new infectious disease occurs. Therefore, it is necessary to assess the long-term effects of changes in family life due to COVID-19 on mental health.

Keywords
child care, COVID-19, depression, family relations, psychological stress

What We Already Know
• COVID-19 is a new infectious disease that has had a significant impact on daily life.
• The mental health of community members has been negatively affected by the experience of the COVID-19 outbreak.
• Data on the effects of changes in family life due to COVID-19 on mental health in Korea is limited.

What This Article Adds
• We provided the evidence of change in family life and mood or stress due to COVID-19.
• Of the total participants, 59.3% responded that depressive mood and stress had increased due to COVID-19.
• Most participants did not have an appropriate way to deal with increased depressive mood and stress.

Introduction
Coronavirus disease 2019 (COVID-19) has become a significant health burden since it was first detected in Korea in January 2020. As of January 2022, there were 53.08 million confirmed cases and 6.31 million deaths worldwide. In Korea, as of August 2022, 20 million confirmed cases and 25,000 deaths have been recorded.¹ To prevent the occurrence and spread of COVID-19, infection control strategies, including social distancing, isolation, and restrictions on facility use, have been implemented and have caused many changes in daily and family life. Telecommuting and online learning at home owing to restrictions on going to work and school closures have been introduced.² Moreover, because the care provided by childcare institutions was limited during the pandemic, the need to take care of children or help with education at home increased. Therefore, as the time spent with the family

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increased, changes in family life occurred, which improved family relationships, such as increased communication between families, but also had a negative effect on deepening family conflicts.\(^3\)

In addition, as the new term “Corona Blue” suggests, the mental health of community members has been negatively affected by the experience of the COVID-19 outbreak, the continued feeling of isolation due to social distancing, and the deepening of economic difficulties.\(^4\) COVID-19-related concerns and anxiety, such as fear of infection, fear of being criticized or harmed by those around you when infected, fear that someone in the family may be infected, and fear of economic damage, might negatively affect mental health.\(^5\)

Therefore, previous studies have focused on changes in family life and their effects on mental health during the COVID-19 outbreak. A study examining the influence of the pandemic on family relationships reported that those who reported negative changes in their family relationships also reported worse mental health.\(^6\) Youth mental health problems were significantly associated with parental psychological symptoms during the COVID-19 pandemic,\(^7\) and family support was positively associated with life satisfaction.\(^8\) COVID-19-related stressors and the perceived negative effects of the pandemic on family life increased the risk of depression and anxiety, while more family health resources reduced the risk of depression and anxiety symptoms.\(^9\) These results suggest the need to consider the impact of family life on mental health during a new outbreak of infectious disease.

However, there are limited data on the effects of family characteristics or changes in family life due to COVID-19 on mental health in Korea. Therefore, the purpose of this study was to investigate the prevalence of depression and stress perception due to COVID-19 and to investigate related factors.

**Methods**

**Data Source and Study Population**

This study used the data of the “Survey on changes in family life due to COVID-19.” The survey aimed to identify changes in family life due to COVID-19 for the Ministry of Gender Equality and Family to establish family policies in Korea.\(^10\) Data were collected by Embrain, a specialized social research institute (https://embrain.com/).

The survey population comprised 1500 adults with children under the high school age. The source population was based on population statistics from the resident registration of May 2020, and income level and gender were reflected in the sample design. According to the household trend survey by the National Statistical Office, income classes constituted 20% of the first quartile, 25% of the second quartile, 25% of the third quartile, and 30% of the fourth quartile; regarding sex, there were 600 men and 900 women.

Embrain asks consent for collection of personal information when recruiting panels and collects personal information such as gender, age, education level, occupation, residence area, marital status, family structure, and income. Based on the information provided when panels registered, male and female panel members with children were randomly invited to participate in the survey through text messages, emails, KakaoTalk, and website advertisements.

Only one family member was allowed to participate in the survey. To determine eligibility, all children living together and the number of children in each age group were entered. A total of 4068 agreed and participated in the survey. Among them, those who did not complete the survey have been excluded, and the survey was discontinued if there were children who did not live together or if there were only adult children. The survey period was from June 1 to 7, 2020, and data were collected through online survey. The survey was conducted until all 1500 adults had completed their questionnaire by setting income level and gender in advance.

Ethical approval of the survey could not be obtained due to the urgency and time-sensitive nature of the survey. However, the survey was at a minimal risk or less based on self-reported online survey by voluntary participation. This study was based on publicly available deidentified data and would not require ethical approval. All participants were informed about the survey, and informed consent was obtained for all study participants.

**General Characteristics**

General characteristics included gender (male, female), age (20-39, 40-49, ≥50 years), respondent’s academic background (=high school, university, graduate school), type of residence (house, apartment, etc), type of home ownership (owned house, lease house), marital status (with spouse, without spouse), number of children (one, two, three or more), level of first-child education (preschool, elementary school, middle school, high school), and household income (first, second, third, or fourth quartile).

**Changes in Family Life Due to COVID-19**

Changes in family life due to COVID-19 included primary caregiver for children before COVID-19 (myself, spouse, both equally provide care, without spouse), changes in child care after COVID-19 (more than before, no change, spouse does it more, without spouse), use of family care leave to care for children (used, did not use), household income change due to COVID-19 (decreased, no change, increased), household expenditure change due to COVID-19 (decreased, no change, increased), time spent at home due to COVID-19 (decreased, no change, increased), leisure activity time change due to COVID-19 (decreased, no change, increased), change in the number of family who eat together due to...
COVID-19 (decreased, no change, increased), and family conflicts due to COVID-19 (yes or no).

Family conflict was defined as a yes/no answer to the following question: “After the spread of COVID-19, do you think that family members experience conflict with each other more often than before?” For those experiencing family conflicts, family members of the conflict (spouse, preschool children, elementary school children, middle school children, high school children, other family members, etc) and the main reason (housework such as preparing meals, compliance with hygiene rules to prevent infection such as washing hands after going out, disagreements regarding going out for family leisure, differences of opinion about leisure activities, individual lifestyles, childcare and care-sharing issues, and economic problems) were investigated.

### Depressive Mood and Stress Perception Due to COVID-19

Changes in depressive mood and stress due to COVID-19 were assessed using the following question: “Do you think your depressive mood or stress has increased after the spread of COVID-19 compared to before?” For those who responded yes, the resolution methods for depressive mood or stress were assessed with the question, “How did you resolve family conflict, depressive mood, and stress after COVID-19?” The response options were consultations with public institutions such as the national and local governments, consultations with private organizations such as private institutions and companies, resolution within the family such as through family conversations, resolution with advice from friends, and did not try to solve or could not find a way to resolve.

### Analysis

The collected data were analyzed using the statistical analysis program SPSS 26.0. The status of depressive mood and stress perception due to COVID-19 and the general characteristics of the study population were presented as frequency and percentage. \( \chi^2 \) tests were performed to determine the proportions of change in depressive mood and stress according to the participants’ general characteristics and the characteristics of changes in family life due to COVID-19. Finally, a binary multiple logistic regression analysis was performed to determine the effects of changes in family life related to depressive mood and increased stress.

### Results

#### Depressive Mood and Stress Perception Due to COVID-19

After the spread of COVID-19, 59.3% of participants perceived that their depressive mood and stress had increased (Table 1). Among them, 46.6% answered that they did not attempt to resolve or could not find a solution to resolve their depressive mood and stress, 42.6% answered that they resolved them within the family, and 8.5% said that they solved them through advice from friends (Supplementary Table 1).

### Depressive Mood and Stress Perception by General Characteristics

Of the total number of participants, 40% were male and 60% were female; regarding age, 36.1% were aged 20-39 years, 51.8% were aged 40-49 years, and 12.1% were aged 50 years or older. Regarding the number of children, 51.6% had two children, 37.9% had one child, and 10.5% had three or more children. For the level of first-child education, 41.1% were preschoolers, 25.0% were high school students, 18.3% were elementary school students, and 15.6% were middle school students. The prevalence of depressive mood and stress was 66.0% and 49.3% in women and men, respectively \( (P < .001) \). The perception of depressive mood or stress according to children’s school age level was 60.6% for those with preschool children, 65.1% for those with elementary school students, 58.5% for those with middle school students, and 53.6% for those with high school students \( (P = .025) \) (Table 1).

### Depressive Mood and Stress Perception by Characteristics of Changes in Family Life Due to COVID-19

Regarding changes in child care after the COVID-19 outbreak, 31.3% responded that they had more responsibilities than before, and 15.3% said that the burden on spouses had increased. Moreover, 46.7% responded that household income decreased, and 32.9% responded that household expenditure increased due to COVID-19. After the spread of COVID-19, 75.1% responded that the time spent at home with their families increased, and 37.4% experienced conflict between family members after the COVID-19 outbreak. Among family members, the majority of participants who experienced conflict were their spouses \( (39.7\%) \) and elementary school children \( (19.1\%) \). The most common causes of family conflict were an increase in housework \( (8\%) \), lifestyle problems \( (21.7\%) \), differences in opinion about leisure activities \( (14.1\%) \), childcare and care-sharing issues \( (11.4\%) \), disagreements regarding going out for family leisure \( (8.4\%) \), problems related to compliance with hygiene rules for infection prevention \( (8.0\%) \), conflicts due to economic problems \( (8.0\%) \), and others \( (0.6\%) \). The perception rate of depressive mood or stress was 71.1% in those caring for children more than before COVID-19, 54.3% in those without change, and 52.2% in those who responded that the spouse had more childcare duties. The prevalence of depressive mood and stress according to changes in the economic environment due to COVID-19 was 69.6% in those with decreased household income, 50.2% in those without change, and 56.5% in those with increased household income. Regarding household expenditure, the prevalence was 64.1% in those with decreased household expenditure, 46.8% in...
those without change, and 68.4% in those with increased household expenditure. Regarding family conflict experience, the prevalence was 87.0% in those with conflicts and 42.8% in those without conflicts (Table 2).

| Factors Related to Increased Depressive Mood and Stress Perception Due to COVID-19 |
|---------------------------------------------------------------|
| In the multiple regression analysis, the odds ratio (OR) for depressive mood and stress perception was significantly higher in those at a graduate school education level than in those at a high school education level (OR = 2.72, 95% CI [1.74, 4.26]). Decreased household income (OR = 2.01, 95% CI [1.54, 2.62]) was associated with the risk of depressive mood and stress. In the case of household expenditure, both participants with decreased (OR = 1.48, 95% CI [1.09, 2.01]) and increased (OR = 1.73, 95% CI [1.28, 2.34]) household expenditure showed a higher OR for depressive mood and stress perception than did those with no change. Family conflict was significantly associated with a higher risk of depressive mood and stress perception (OR = 7.95, 95% CI [5.92, 10.68]) (Table 3). |

Discussion

Various strategies, such as social distancing and contact tracing, were implemented to prevent the occurrence and spread of COVID-19. The outbreak of a new infectious disease is known to cause various psychological problems, such as depression and anxiety, not only in patients but also in the entire community. In addition, it can cause various changes in family life, such as increased childcare burden and family conflicts. Therefore, this study aimed to investigate the effects of changes in family life due to COVID-19 on depressive mood and stress.

In this study, 59.3% of participants responded that they experienced an increase in depressive mood and stress caused by COVID-19. This is similar to previous systematic reviews addressing the prevalence of mental health problems during the COVID-19 pandemic. In the United Kingdom, the prevalence of anxiety increased by 26.35%, from 4.65% in the prepandemic period to 31% in the pandemic period. Similarly, while the prevalence of prepandemic depression was 4.12%, that during the pandemic was 32.0%, indicating a 27.88% increase.11 In China, the prevalence of depressive mood and stress perception increased from 3.8% in the prepandemic period to 21.2% during the pandemic period. The findings of this study are consistent with these previous reports.
symptoms was 27%, 26%, and 61% in COVID-19, general illness, and chronic illness patients, respectively, and the prevalence of anxiety symptoms was 14%, 23%, and 85%, respectively. The prevalence of depression was 14.6%, and depression was more prevalent among health care workers than among non–health care workers in Vietnam.

These results suggest that COVID-19 increased the prevalence of mental health problems among the general population compared with that in the prepandemic period. Because of the prolonged COVID-19 outbreak, communities might suffer significant long-term mental health consequences, and policymakers and mental health services would need to make efforts to monitor mental health and provide interventions to support those in need.

Depressive mood and stress were significantly higher when household income decreased and household expenditure increased than when household income did not change. These results are consistent with those of previous studies that showed that those with low economic status were more likely to be at risk of depression. A huge decrease in income and low current income during COVID-19 are significantly associated with more anxiety/depression symptoms among non–health care workers. Families with unstable incomes are more likely to experience severe anxiety during the COVID-19 pandemic. Because economic level is a well-known risk factor for mental health, when the economic situation worsens due to COVID-19, psychological and mental health problems may follow.

Experience of family conflict was significantly associated with increased depressive mood and stress due to COVID-19. Moreover, 75.1% of participants indicated that the time spent with family at home increased after the spread of COVID-19, and 37.4% responded that conflicts among family members increased after the COVID-19 outbreak. The reasons for family conflict were the increase in household work (27.8%), followed by lifestyle (21.7%) and differences in opinions on leisure activities (14.1%). However, among those experiencing family conflicts, depressive mood, and stress due to COVID-19, 46.6% did not attempt to resolve or could not find a way to resolve them, and 42.6% resolved

Table 2. Depressive Mood and Stress Perception by Characteristics of Changes in Family Life Due to COVID-19.

| Variables | Category | Total | Yes | No | P value |
|-----------|----------|-------|-----|----|---------|
| | | | | | |
| Primary caregiver for children before COVID-19 | Myself | 715 (47.7) | 485 (67.8) | 230 (32.2) | <.001 |
| | Spouse | 396 (26.4) | 193 (48.7) | 203 (51.3) | |
| | Both equally provide care | 355 (23.6) | 192 (54.1) | 163 (45.9) | |
| | Without spouse | 34 (2.3) | 20 (58.8) | 14 (41.2) | |
| Changes in child care after COVID-19 | More than before | 470 (31.3) | 334 (71.1) | 136 (28.9) | <.001 |
| | No change | 766 (51.1) | 416 (54.3) | 350 (45.7) | |
| | Spouse does it more | 230 (15.3) | 120 (52.2) | 110 (47.8) | |
| | Without spouse | 34 (2.3) | 20 (58.8) | 14 (41.2) | |
| Use of family care leave to care for children | Used | 125 (8.3) | 76 (60.8) | 49 (39.2) | .727 |
| | Did not use | 1375 (91.7) | 814 (59.2) | 561 (40.8) | |
| Household income change | Decreased | 700 (46.7) | 487 (69.6) | 213 (30.4) | <.001 |
| | No change | 777 (51.8) | 390 (50.2) | 387 (49.8) | |
| Household expenditure change | Decreased | 468 (31.2) | 300 (64.1) | 168 (35.9) | <.001 |
| | No change | 538 (35.9) | 252 (46.8) | 286 (53.2) | |
| | Increased | 494 (32.9) | 338 (68.4) | 156 (31.6) | |
| Time spent at home | Decreased | 19 (1.3) | 10 (52.6) | 9 (47.4) | <.001 |
| | No change | 354 (23.6) | 157 (44.4) | 197 (55.6) | |
| | Increased | 1127 (75.1) | 723 (64.2) | 404 (35.8) | |
| Leisure activity time change | Decreased | 463 (30.9) | 315 (68.0) | 148 (32.0) | <.001 |
| | No change | 565 (37.7) | 296 (52.4) | 269 (47.6) | |
| | Increased | 472 (31.5) | 279 (59.1) | 193 (40.9) | |
| Change in the number of family who eat together | Decreased | 43 (2.9) | 33 (76.7) | 10 (23.3) | <.001 |
| | No change | 450 (30.0) | 210 (46.7) | 240 (53.3) | |
| | Increased | 1007 (67.1) | 647 (64.3) | 360 (35.7) | |
| Family conflict experience | Yes | 561 (37.4) | 488 (87.0) | 73 (13.0) | <.001 |
| | No | 939 (62.6) | 402 (42.8) | 537 (57.2) | |

Data were expressed as number (%).
Abbreviation: COVID-19, Coronavirus disease 2019.
them within the family, such as through family conversations. An increase in the time spent at home due to the prolonged COVID-19 outbreak would increase conflict among family members, but there are often no adequate ways to relieve them. This suggests that the outbreak of new infectious diseases, such as COVID-19, or the risk thereof could cause stress, depression, and anxiety in the home. Therefore, in the event of an outbreak of a new infectious disease, such as COVID-19, or the risk thereof could cause stress, depression, and anxiety in the home. There is a need for psychological support through efforts and measures to promote counseling in schools, educational institutions, and workplace counseling centers for office workers.

This study has several limitations. First, since we used data collected in June 2020, the evolving government infection control policy and fatigue caused by the prolonged COVID-19 pandemic might not be reflected in this study. Variants of COVID-19, such as Delta and Omicron, are discovered, and COVID-19 is continuously spreading. Future studies are needed to evaluate the relationship between changes in family life and mental health, reflecting the prolonged COVID-19 pandemic. Second, when investigating changes in family life due to COVID-19, external factors such as the community environment for emergency care, education, child care, and workplace flexibility should also be considered. There may be differences in emergency care programs and financial support depending on the situation of local governments. Similarly, there may be differences in workplace COVID-19 quarantine guidelines, such as telecommuting and work-time flexibility. These factors should be included in future studies investigating changes in family life due to new infectious diseases. Third, this survey used the data of the “Survey on changes in family life due to COVID-19.” The survey did not include depressive symptoms or history of depression before the COVID-19 outbreak. In addition, COVID-19-related factors did not include a history of COVID-19 infection, experience of being classified as a contact person, and self-quarantine experience. Finally, there was

| Variables | Category | OR  | 95% CI |
|-----------|----------|-----|--------|
| Gender (/male) | Female | 1.38 | 0.93, 2.04 |
| Age (/≥50) | 40-49 | 1.28 | 0.84, 1.96 |
| | 20-39 | 1.09 | 0.74, 1.62 |
| Respondent’s academic background (/≤high school) | University | 1.88 | 1.35, 2.61 |
| | Graduate school | 2.72 | 1.74, 4.26 |
| Type of residence (/house) | Apartment | 1.42 | 0.89, 2.28 |
| | Other | 1.07 | 0.63, 1.83 |
| Type of home ownership (/owned house) | Lease house | 1.18 | 0.91, 1.53 |
| Marital status (/with spouse) | Without spouse | 1.20 | 0.47, 3.10 |
| Number of children (/≥3) | 2 | 1.30 | 0.84, 2.02 |
| | 1 | 1.28 | 0.84, 1.95 |
| Household income (/first quartile) | Second quartile | 1.04 | 0.71, 1.52 |
| | Third quartile | 1.10 | 0.75, 1.61 |
| | Fourth quartile | 1.13 | 0.78, 1.64 |
| Primary caregiver for children before COVID-19 (/spouse) | Myself | 1.53 | 0.96, 2.44 |
| | Take care of each other equally | 1.05 | 0.71, 1.53 |
| | Without spouse | 0.82 | 0.32, 2.12 |
| Changes in child care after COVID-19 (/no change) | More than before | 1.15 | 0.86, 1.55 |
| | Spouse does it more | 0.97 | 0.67, 1.40 |
| | Without spouse | 0.82 | 0.32, 2.12 |
| Use of family care leave (/do not use) | Use | 1.13 | 0.72, 1.78 |
| Household income change (/no change) | Decreased | 2.01 | 1.54, 2.62 |
| | Increased | 1.09 | 0.39, 2.99 |
| Household expenditure change (/no change) | Decreased | 1.48 | 1.09, 2.01 |
| | Increased | 1.73 | 1.28, 2.34 |
| Time spent at home (/no change) | Decreased | 1.43 | 1.01, 2.02 |
| | Increased | 1.21 | 0.78, 1.89 |
| Leisure activity time change (/no change) | Decreased | 1.20 | 0.91, 1.57 |
| | Increased | 0.93 | 0.46, 1.86 |
| Change in the number of family who eat together (/no change) | Decreased | 1.27 | 0.92, 1.75 |
| | Increased | 1.59 | 1.00, 2.51 |
| Family conflict experience (/no) | Yes | 7.95 | 5.92, 10.68 |

Abbreviations: COVID-19, Coronavirus disease 2019; OR, odds ratio.
no validated questionnaire because it was a new topic of changes in family life due to COVID-19 when the survey was conducted, and the developed questionnaire was not validated due to the urgency and time constraints of evaluation. Depressive mood was assessed relying on a single question, further studies would be needed to assess its association with clinically important depression.

**Conclusion**

This study investigated various factors that may cause depressive mood or stress due to COVID-19, including general characteristics and family life changes. According to the results of this study, after the spread of COVID-19, the proportion of increase in depressive mood and stress was high; however, most participants did not have an appropriate way to resolve them. The general characteristics of the study population and various aspects of family life changes due to COVID-19 were related to depressive mood and stress. The results of this study can be used as evidence for changes in family life and mental health management in the event of a new infectious disease.

**Authors’ Note**

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**Supplemental Material**

Supplemental material for this article is available online.

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