



Associations between Parental Factors and Children's Screen Time During the COVID-19 Pandemic in South Korea

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Abstract

This study investigated how parental depression, parental self-care, family conflict, and parental fear of COVID-19 are associated with children's screen time during the COVID-19 pandemic. Data were collected online among South Korean families, resulting in 246 parents (59% fathers) with children between 6 and 12 years of age. Path analysis and multi-group structural equation modelling of fathers and mothers were conducted. Parent's fear of COVID-19 was positively associated with parental depression. Parent's fear of COVID-19 and parental depression were negatively related to parental self-care, which was negatively linked to family conflict. Family conflict was positively associated with children's screen time. The relationships between parental factors and children's screen time were different for mothers and fathers. Our results show that multiple family dynamics interact with children's screen time, emphasizing the need to look beyond parenting practices in understanding the effects of COVID-19 pandemic on children's screen time.

Keywords COVID-19 · Child · Depression · Family conflict · Screen time

Children in the current era are distinctively different from the previous generations in that they are faced with an array of digital and mobile devices. Children's screen time includes time spent on traditional media, such as TV and computer, and on more recently developed devices, such as tablets, phones, and gaming consoles. As children's screen time has been rapidly increasing in the past decades around the world [1, 2], excessive screen time became a serious public health concern. Too much screen time is detrimental to children's development and well-being due to its known links to aggressive behavior, substance use, language delay, eating disorder, obesity, and psychological issues [3–5]. Thus, screen time is an important marker of children's healthy development that needs to be investigated.

Regrettably, the spread of the novel coronavirus (COVID-19) since early 2020 further increased the risk of excessive screen use by children [6]. With school closures and lockdown policies implemented in many parts of the world at the beginning of the pandemic, children were confined at home with their parents, with few activities available other than using digital devices [7–11]. In addition, because children spent significantly more time at home with their parents, their use of media devices may have been more heavily affected by family dynamics. It is therefore important to consider the role of broad family factors to fully understand the determinants of screen use and the impact of the COVID-19 pandemic on children. Thus, in this study, we move beyond the literature which mainly focused on the role of parenting practices [12] and consider other family factors.

Parents' fear of COVID-19

While many experienced exacerbated fears of being in contact with others and of COVID-19 [13], parents may be the most vulnerable group due to the concern for their children's safety [14]. This is in line with a previous finding that parental status was an indicator of increased fear during the swine flu [15, 16]. Because of the highly infectious

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nature of COVID-19 and the uncertainty about the duration of the pandemic and its ultimate resolution, parents' fear of COVID-19 may take a toll on the family environment and children's well-being. Thus, the pandemic in the early stages likely caused a reshaping of family dynamics as members have no choice but to engage with one another under increased fear due to the COVID-19 [17].

Parental depression

Not only are parents more inclined to experience elevated fear, but parents are also at a greater risk to develop broader internalizing symptoms during the COVID-19 pandemic than non-parent adults [18]. Depression was one of the well-documented psychological issues of the parents during the pandemic [19]. Parents had to perform conflicting responsibilities such as taking precautions against the virus transmission, working remotely or looking for work, tending to their children's online education, and caring for the family with reduced social support and resources [20]. This increased parental burden could potentially lead to depression [21]. In addition, depressed parents are more likely to be sedentary and spend more time with screen devices themselves because of lack of energy, unwittingly increasing their children's screen time [22]. But it is still unknown how parental depression is related to children's well-being in the first few months into the pandemic in South Korea (hereafter Korea).

Parental self-care

Children are more prone to experiencing stress when parents face mental health issues because parents' stress could be transmitted to the children in direct and indirect ways [19, 23]. Also, children may expect parents to be a source of comfort during the crisis. Thus, literature emphasized that parents should practice self-care to promote their own well-being, which benefits not only themselves but also their children [24]. According to WHO, self-care is defined as the ability to promote and maintain health and cope with challenges through the active engagement in maintaining own well-being [25]. Although self-care is composed of several domains, we focus on physical self-care because it is the most fundamental domain that underpins all functioning [26]. Specifically, we identify diet intake, physical activity, and weight management as the core aspects of self-care during the COVID-19, based on the adverse associations reported in the literature among stress, weight gain, and their risk factors such as sedentary lifestyle and snacking behaviors [27, 28]. However, it remains to be examined

further how parental self-care would influence children's well-being.

Family conflict

The pandemic-related stress experienced by parents may have cascading effects within families, possibly affecting couple relationships and parent-child dynamics. However, family functioning under the pandemic could be varied across countries based on culture. For instance, a previous study in the U.S. found increased conflicts between parents and children since the beginning of the pandemic [29]. Another study conducted in China reported an increased divorce rate during the COVID-19 lockdown [30]. Interestingly, the divorce rate declined in Korea, as social distancing reduced spousal conflicts involving meeting with extended family members for traditional obligations, an important determinant of divorce in Korea [31]. Thus, further investigations are needed to understand the culturally tailored association between changing family dynamics captured by family conflict and child's development during the pandemic.

Current study

The associations between parental factors and children's screen time existed before the pandemic. For instance, parents' self-efficacy and psychological well-being were negatively related to excessive screen time of children [32, 33]. Parents' own screen use and screen media attitudes were associated with children's screen use [34–36]. Parents regulating children's screen time predicted less screen time by children [36, 37]. Parent-child interactions were found to be mediators in the relationship between children's excessive screen time and poor psychological well-being [38].

The COVID-19 pandemic has accelerated changes in family environments beyond those examined in the previous literature on children's screen time. With increased fear of the pandemic and the difficulties of navigating multiple responsibilities with reduced social support, parents may experience depression, which may negatively affect family dynamics. Under significant psychological burden due to the pandemic, parents may also practice inadequate self-care, unable to promote the well-being of the children and themselves. Parents' fear, depression, and insufficient self-care can directly contribute to increased screen time by children through ineffective parenting or dysregulated home environments. Moreover, family conflicts may make parental regulation of screen time difficult.

Parents are in a more important position to influence children’s screentime during the pandemic due to the closure of childcare facilities and schools, thereby increasing proximity with the children at home. By focusing on family factors that were affected by the pandemic, we may find modifiable risk factors of children’s screen time that may promote optimal children’s screen-using behaviors.

Therefore, we propose the model depicted in Fig. 1, which identifies the hypothesized associations among parents’ fear of COVID-19, parents’ depression, parents’ self-care, family conflict, and child’s screen time. Following this model, we propose four hypotheses:

H1. Parents’ fear of COVID-19 is positively associated with parents’ depression and family conflict.

H2. Parents’ fear of COVID-19 and parents’ depression are negatively associated with parents’ self-care.

H3. Parents’ self-care is negatively related to family conflict and children’s screen time.

H4. Parents’ fear of COVID-19, parents’ depression, and family conflict are positively related to children’s screen time.

The concurrent evaluation of multiple factors enabled by structural equation path analysis will provide us with a broad view of the family environment associated with children’s screen time. Moreover, we investigate differences in specific associations between fathers and mothers by

conducting multi-group analysis and testing indirect effects. In the absence of prior research informing about such differences, however, we approach this as an exploratory aim.

Methods

This research was conducted in compliance with American Psychological Associations ethical standards in the treatment of participants. The participants provided consent. Institutional Review Board from Columbia University (protocol number AAAT0180 (Y01M03)) approved the study.

Participants

Data were collected as part of a larger study assessing the income, work experience, home environment, and health status of the members of households during the COVID-19 pandemic in Korea. Participants consisted of a nationally representative sample of 2,000 households who were surveyed during June 24–30, 2020, in Korea. To be eligible for the survey participation, participants had to be a parent and be of age between 25 and 55. Only one member of the household was surveyed. When a participant has multiple children, they were asked to think of one child of the age range to answer the questionnaire. The study included 246

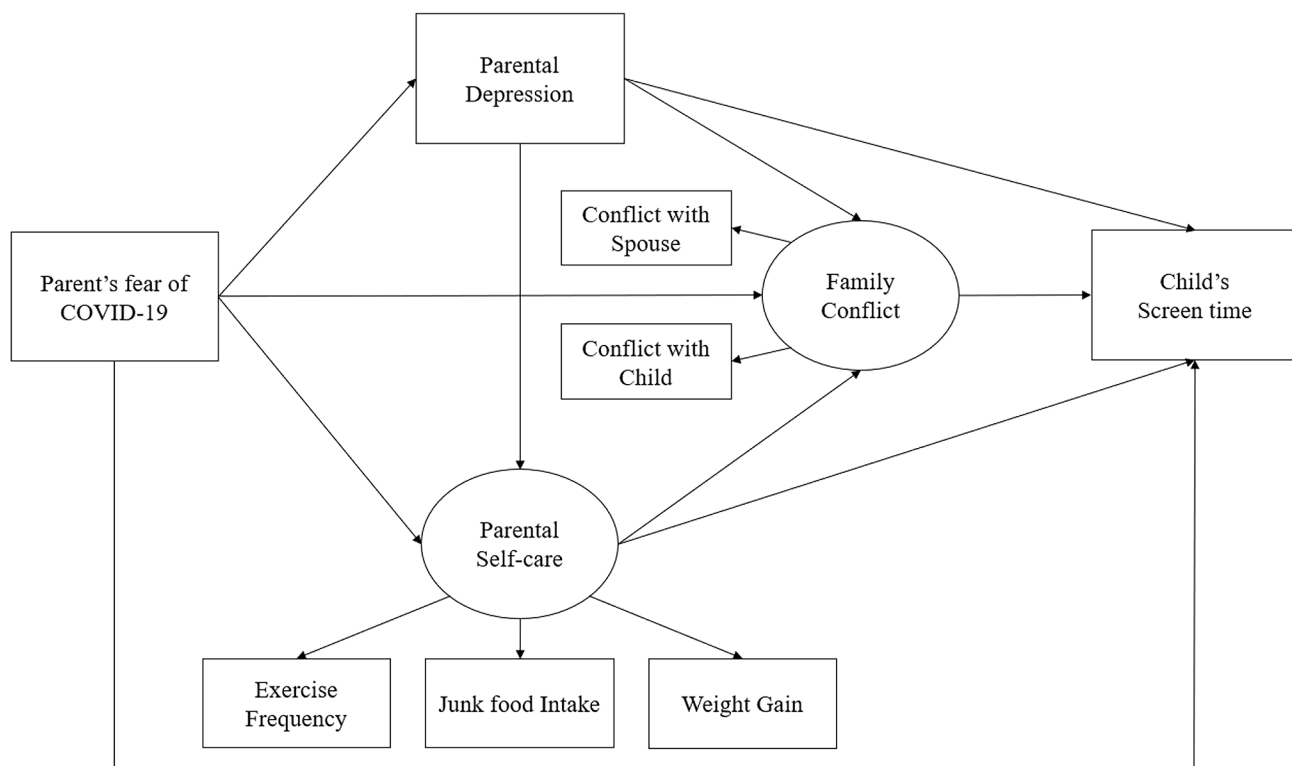


Fig. 1 Hypothesized Structural and Measurement Model

parents, restricted to those with at least one child between 6 and 12 years of age. The sample size satisfies common recommendations for sample size requirements [39], given 15 parameters and 10 variables in the structural equation model (SEM) analysis (see Statistical Analysis).

Procedures

Recruitment of participants and implementation of the survey were conducted by a professional survey firm called InVight in South Korea. Participants were selected from the company's panel who regularly participated in its online surveys. Surveys were completed online in 20 to 25 min. Small monetary benefits were provided for completing the survey.

Measures

Fear of COVID-19

Participants were asked to indicate how much they fear getting infected with COVID-19. Responses were recorded on a five-point Likert scale from 1 = "not afraid at all" to 5 = "afraid very much," which was treated as an ordinal score.

Parental depression

The Depression scale was from the Panel Study on Korean Children (PSKC), which is an ongoing longitudinal study of 2150 Korean families since 2008. The original measure was based on the Kessler Psychological Distress Scale (K6), which PSCK used to assess parental depression taking the Korean psychological aspects into consideration [40]. Specifically, participants indicated the level of agreement with the statements (1) "how often did you feel anxious?" (2) "how often did you feel hopeless?" (3) "how often did you feel restless or fidgety?" (4) "how often did you feel so depressed that nothing could cheer you up?" (5) "how often did you feel that everything was an effort?" and (6) "how often did you feel worthless?" in the past 30 days. Responses were on a 5-point scale from 1 = "never" to 5 = "always," which were summed to form a composite depression score. Internal consistency (Cronbach's alpha) was $\alpha = 0.93$.

Parent's self-care

Participants were asked to indicate their level of agreement with three items addressing self-care since the COVID-19 pandemic, specifically between January 2020 and May 2020, such as "I have exercised less frequently," "I have eaten more junk food," and "I have gained weight" since

the pandemic. Answers were recorded on a five-point Likert scale where 1 = "strongly disagree" to 5 = "strongly agree." Scores were reversely coded for each category with higher scores indicating a stronger presence of that dimension. Each reported category was treated as an ordinal scale, providing three observed measures of parental self-care.

Family conflict

Participants indicated whether they had more or less conflict or quarrels with (1) their spouse and (2) their child between January and May 2020, compared to the pre-COVID-19 times. Responses were made on a 5-point scale, from "much less conflict" to "much more conflict," which were treated as an ordinal scale.

Child screen time

Screen time was assessed by the parent reporting the total number of hours the child spent viewing digital screens for entertainment purposes, such as TV, computer, tablet, or game device per day. Five response options were provided including (1) "0–1 hour," (2) "1–2 hours," (3) "2–4 hours," (4) "4–6 hours," and (5) "6 hours and more." Responses were treated as an ordinal score.

Statistical analysis

IBM SPSS Statistics 20 was used for descriptive statistics and Mplus for SEM analysis. A series of confirmatory factor analyses were conducted to assess the construct validity of measurement of family conflict and parental self-care. The observed variables of (1) conflict with spouse and conflict with child and (2) junk food intake, weight gain, and exercise frequency were loaded to family conflict and parental self-care respectively to construct them as latent variables. The goodness of fit of each model was indicated by the comparative fit index (CFI), Tucker Lewis index (TLI), and root mean square error of approximation (RMSEA) were assessed. Adequate fit for parsimonious SEM has been identified as $CFI \geq 0.90$, $TLI \geq 0.90$, and $RMSEA \leq 0.10$ [41]. A value of $\alpha = 0.05$ was set for statistical significance.

After ensuring the adequate fit of the measurement models, an SEM path analysis of the hypothesized model (see Fig. 1) was conducted first for the total sample. Subsequently, a multi-group SEM analysis was conducted with the father and mother subsamples. Child gender was entered as a control variable in all path analyses.

Additionally, indirect path analysis was assessed between parental fear of COVID-19 and children's screen time to detect any significant mediation, using maximum likelihood estimation and a bias-corrected bootstrapping procedure

with 1000 iterations. The bootstrapping method can correct bias and thus give a more accurate estimate [42]. The indirect effect is considered statistically significant if zero is not contained in the 95% confidence interval.

Results

Demographics for the sample are provided in Table 1. The participants included mothers (41%) and fathers (59%) who mostly were in their early 40s, married, and with a four-year college degree. Descriptive statistics for the study variables are shown in Table 2 and correlations among variables as well as factor loadings for latent variables are presented in Table 3. All observed variables loaded significantly onto their respective latent factors (family conflict and parent's self-care) based on the confirmatory factor analysis. All measurement models showed a close fit (family conflict: CFI=0.94; TLI=1.00; RMSEA=0.01; self-care: CFI=TLI=1.00; RMSEA=0.00) with high factor loadings (see Table 3).

Structural model for the total sample

The SEM path analysis on the total sample resulted in a satisfactory fit with the data (CFI=0.97, TLI=0.94, RMSEA=0.05), as detailed in Fig. 2. Parental fear of COVID-19 was positively associated with parent's depression ($\beta=0.31, p<.05$) and negatively with parent's self-care ($\beta=-0.20, p<.05$), but had no association to family

conflict. Parental depression was related to decreased level of parent's self-care ($\beta=-0.36, p<.05$). Parental self-care was linked to decreased family conflict ($\beta=-0.38, p<.05$), while family conflict was associated with increased child screen time ($\beta=0.24, p<.05$). One negative indirect effect was found between parents' fear of COVID-19 and parental self-care through parental depression ($\beta=-0.11$, Bootstrap 95% Confidence Interval: $-0.20, -0.04$). No other significant indirect effects between parent's fear of COVID-19 and child's screen time were detected.

Structural model across fathers and mothers

The multi-group testing resulted in satisfactory model fit (CFI=0.97, TLI=0.94, RMSEA=0.05). As shown in Fig. 2, both mothers and fathers had positive association from COVID-19 fear to parental depression ($\beta\geq 0.26, p<.05$) and negative association from parental depression to self-care ($\beta\leq -0.26, p<.05$). Only paternal fear of COVID-19 was negatively related to self-care ($\beta=-0.24, p<.05$) and paternal family conflict was positively linked to child screen time ($\beta=0.29, p<.05$). In contrast to fathers, only maternal COVID-19 fear was negatively associated with child screen time ($\beta=-0.21, p<.05$) and maternal self-care was negatively related to maternal family conflict ($\beta=-0.53, p<.05$). One negative indirect effect was found between parents' fear of COVID-19 and parental self-care through parental depression for mothers ($\beta=-0.13$, Bootstrap 95% Confidence Interval: $-0.29, -0.04$). No other significant indirect effects were detected.

Table 1 Sample demographics

Variable	%
Father's age	42.2 (SD=4.46)
Mother's age	40.6 (SD=4.42)
Marital Status	
Married and lives with a spouse	98.0
Married and does not live with a spouse	1.2
Divorced	0.8
Father respondent's educational level (n=145)	
8th grade or less	0.0
High school graduate and GED	3.4
Some college, or 2-year degree	23.4
4-year college graduate	53.1
More than a 4-year college degree	20.0
Mother respondent's educational level (n=101)	
8th grade or less	0.0
High school graduate and GED	13.9
Some college, or 2-year degree	30.7
4-year college graduate	43.6
More than a 4-year college degree	11.9
Child's gender	
Boy	53.3
Girl	46.7

Discussion

We aimed to understand how children's screen time may have been influenced by parental fear of COVID-19, depression, self-care, and family conflict in the context of the COVID-19 pandemic and lockdown policies in South Korea. Examining a model of priori hypothesized associations, we found a positive association between parents' fear of COVID-19 and their depression. Both parents' fear of COVID-19 and depression were negatively related to their self-care, which in turn was negatively linked to family conflict. Further, family conflict was positively associated with children's increased screen time, but other parental factors were not generally related to children's screen time. Moreover, there were notable differences between fathers and mothers in their associations with children's screen time.

It is worth noting that parents' fear of COVID-19 and related depression were linked to lower tendencies to practice self-care, as expected from our hypothesis. One explanation for this finding is that the COVID-19 pandemic

circumstances increased fear and depression among parents, draining the parents and impairing their ability to practice self-care such as limiting consumption of junk food, exercising regularly, and managing weight. In line with the WHO's definition of depression as a mood disorder characterized by loss of interest and feelings of low self-worth [43], depressed parents in our samples seemed to lack the motivation to practice self-care.

Furthermore, parents' fear of COVID-19 and depression had no association with family conflict. This result contrasted with the prior research which showed that the COVID-19 is accompanied by increased mental problems and stress, causing disruptions in family functioning and well-being [44]. This finding may suggest that Korean parents, at least in our sample, overcame the difficulties from obstructive experience during the pandemic and were resilient not to spill over the hardships on family relationships. Another interpretation is that social distancing associated with the pandemic may have directly reduced family conflict, as important causes of marital conflict in Korea are cultural obligations with extended family members, which were avoided during the pandemic [45].

Finally, parental self-care was negatively associated with family conflict, which is linked to child's screen time. There was no direct association between parental self-care and child's screen time. The negative association between parents' self-care and family conflict suggests the role of self-care as a buffer between couples and between parents and children in potential conflict situations. Parents are more likely to respond in anger when they are distressed, and self-care ensures that parents' needs are met so they have more psychological resources to resolve a conflict situation [46, 47].

In what we believe to be the first study examining broad family factors associated with children's screen time during the COVID-19 pandemic, we found that family conflict was the most prominent correlate, while parents' fear of COVID-19, depression, and self-care did not show much association. This finding converges with prior research suggesting that children from dysfunctional homes are more prone to engage in screen use. For example, family violence was found to be a risk factor for an increase in screen use among children [48]. Also, children may turn their attention to the screen to escape from an undesirable home situation [49], as watching TV and using internet are some of the most frequently used coping strategies by children to buffer negative moods and interpersonal conflict [50].

Moreover, our findings highlight the differences between mothers and fathers, suggesting that the distribution of parental responsibilities between parents and associated impacts upon child outcomes are widely varied. For instance, fathers' fear of COVID-19 was negatively associated with

Table 2 Descriptive statistics of study variables for the total sample and subgroups

	Scale	Mean (SD)			t-test
		Total (n=246)	Fathers (n=145)	Mothers (n=101)	
Fear of infecting with COVID-19 ^a	1–5	3.63 (0.88)	3.52 (0.94)	2.27 (0.81)	t (244) = -1.81, p = .07
Family conflict					
Conflict with spouse ^b	1–5	3.08 (0.66)	2.97 (0.58)	3.15 (0.74)	t (242) = -2.10, p = .04*
Conflict with child ^b	1–5	3.32 (0.75)	3.23 (0.72)	3.64 (0.86)	t (244) = -4.06, p = .01*
Parental depression ^c	6–30	16.11 (5.47)	14.71 (5.11)	17.82 (5.74)	t (244) = -4.46, p = .00*
Parental self-care after pandemic					
Exercise frequency ^d	1–5	2.63 (1.03)	2.80 (1.02)	2.56 (1.01)	t (244) = 1.78, p = .08
Junk food intake ^d	1–5	2.74 (0.99)	3.01 (0.98)	2.47 (0.90)	t (244) = 4.34, p = .00*
Weight gain ^d	1–5	2.86 (1.07)	3.13 (1.06)	2.59 (1.04)	t (244) = 3.95, p = .00*
Child's screen time ^e	1–5	2.72 (1.16)			

^a Scores ranged from "not afraid at all" (1) to "afraid very much" (5)

^b Scores ranged from "much less conflict" to "much more conflict."

^c Composite score of 7 items each ranged from "strongly disagree (1)" to "strongly agree (5)"

^d Scores ranged from "strongly disagree" to "strongly agree."

^e Scores ranged from "0–1 hour," "1–2 hours," "2–4 hours," "4–6 hours," to "6 hours +"

*p < .05

self-care, while fathers' conflicts with spouse and child were positively related to children's screen time. But we did not find such connections from mothers. As the test of the indirect effect showed, mothers' fear of COVID-19 may lead to depressed effect, which is associated with reduced self-care. Whereas fathers may also experience negative affectivity around COVID-19, this seems not to be associated with reduced self-care.

These findings suggest that mothers experience negativity around COVID-19, which may inhibit their ability or desire to engage in self-care. It is consistent with the unequal distribution of domestic responsibilities between spouses in Korea and elsewhere [51, 52] and the greater effects of the pandemic on the mental health of women than men [53].

Table 3 Correlations and factor loadings among variables in total sample

	1	2	3	4	5	6	7	8
1. Fear of COVID	1							
2. Parental depression	0.30*	1						
3. Family conflict with spouse	-0.02	0.20*	1					
4. Family conflict with child	0.04	0.23*	0.34*	1				
5. Parental self-care - Exercise frequency	-0.16*	-0.28*	-0.11*	-0.19*	1			
6. Parental self-care - Junk food intake	-0.21*	-0.40*	-0.18*	-0.23*	0.50*	1		
7. Parental self-care - Weight gain	-0.13*	-0.33*	-0.12*	-0.19*	0.45*	0.54*	1	
8. Child's screen time	0.02	0.09*	0.09*	0.17*	0.00	-0.12*	-0.05	1
<i>Factor loadings</i>								
Family conflict			[0.53	0.67]				
Parental self-care					[0.68	0.83	0.68]	

Note. All correlations in and factor loadings $p < .05$; Controlled for child's gender

* indicates a statistically significant result ($p < .05$)

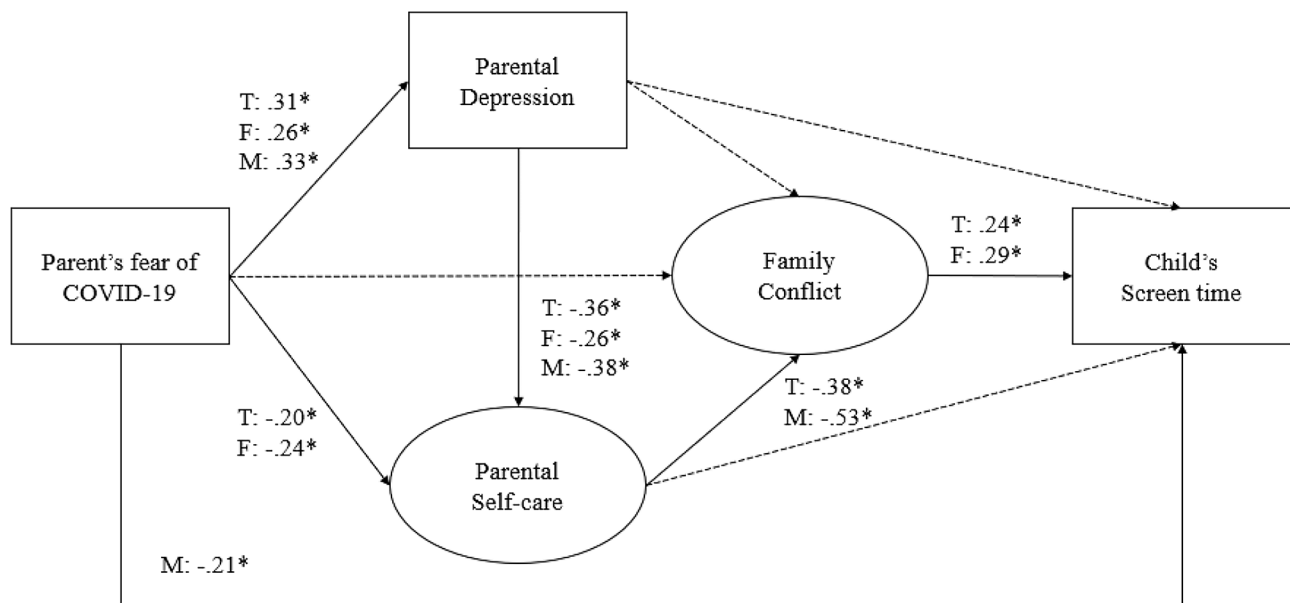


Fig. 2 Final model with standardized path coefficients

Although not shown in the figure, child gender was entered as a control variable. Ellipses and rectangles represent unobserved latent and observed variables, respectively. Dashed line indicates a nonsignificant path. * indicates a statistically significant path ($p < .05$)

Also, because children interpret mother and father figures differently [54], they may feel more heavily stressed when conflicts arise with fathers, who are seen as less-loving figures compared to mothers, and more often partake in avoidant coping such as playing game or watching TV [55].

On the other hand, mothers' fear of COVID-19 was negatively related to children's screen time, and mothers' self-care was negatively related to conflict with their spouse

and child, while those of fathers did not show such associations. Because mothers are still more deeply involved in children's lives [54], mothers could be more equipped to deal with family conflict in a healthy direction when they actively practice self-care [52]. Furthermore, although limited access to social support and physical network could easily lead to more screen time, the negative link between maternal fear of COVID-19 and children's screen time

suggests that some mothers are more resilient in the pandemic and try to limit their children's screen time by providing other engaging activities for their children [55].

Limitations

We acknowledge that there are several limitations to our study. First, the causal relationships among the study variables cannot be determined due to the cross-sectional nature of the study design, which warrants caution in interpreting the results. Second, our sample was over-represented with higher educated Korean parents who had access to the online survey. The majority of the participants was married and living with a spouse. Thus, the findings in the study may not be applied to families with less education, or for different family structures such as single-parent household. Third, our understanding of screen time is limited to hours per day of watching TV, using computer, tablet, and playing game on devices. Therefore, we are unable to examine the content or context of the screen time. Lastly, the data collection was conducted in the first half of 2020. Due to the rapidly evolving nature of the pandemic, it may not fully reflect the current situation. Notwithstanding these limitations, this is the first study we are aware of that illuminates the potential mechanisms linking family dynamics and children's screen time during the COVID-19 pandemic in Korea.

Summary

The COVID-19 outbreak caused great upheaval to family lives, and its impact on parents and children is likely to persist. The current findings echo previous research that child outcome and well-being are dependent on family dynamics [56]. Although technology offers us opportunities to virtually connect with loved ones and overcome social isolation, many families have expressed concerns about a rapid increase in children's screen use [57]. Given that screen time is unavoidable in the current era, families in the COVID-19 era are in need of recommendations and guidelines to find the best way to coexist with digital devices in a healthy and safe way. Therefore, it is urgent that we recognize the burden COVID-19 places on the multiple family factors and child outcomes including screen time. This argues for providing practical help to promote parents' self-care and building family cohesion and resilience.

Future research should favor longitudinal studies in which we can examine causality including both pre-, during, and post-COVID-19 pandemic data. Also, our findings on the separate effects for mothers and fathers rely on subsamples with relatively small sample sizes, calling

for a need to replicate them in the future. More research on various factors of family dynamics and parental factors will help us better understand what constitute optimal family environments for children's screen use and well-being.

Compliance with Ethical Standards The authors declare that they have no conflict of interest. Informed consent was obtained from all individual participants included in the study. Institutional Review Board (protocol number AAAT0180 (Y01M03)) approved the study.

References

- Rideout VJ, Foehr UG, Roberts DF (2010) Generation M² Media in the lives of 8- to 18-year-olds. A Kaiser family foundation study. Available from <https://files.eric.ed.gov/fulltext/ED527859.pdf>
- Sigman A (2012) Time for a view on screen time. *Arch Dis Child* 97:935–942. doi: <https://doi.org/10.1136/archdischild-2012-302196>
- Murray JP (2008) Media violence: The effects are both real and strong. *Am Behav Sci* 51:1212–1230. doi:<https://doi.org/10.1177/0002764207312018>
- Madigan S, McArthur BA, Anhorn C, Eirich R, Christakis DA (2020) Associations between screen use and child language skills: a systematic review and meta-analysis. *JAMA Pediatr* 174:665–675. doi: <https://doi.org/10.1001/jamapediatrics.2020.0327>
- Lissak G (2018) Adverse physiological and psychological effects of screen time on children and adolescents: Literature review and case study. *Environ Res* 164:149–157. doi:<https://doi.org/10.1016/j.envres.2018.01.015>
- Ribner AD, Coulanges L, Friedman S, Libertus ME (2021) Screen time in the Coronavirus 2019 era: International trends of increasing use among 3- to 7-year-old children. *J Pediatr* 239:59–66. doi: <https://doi.org/10.1016/j.jpeds.2021.08.068>
- Eyumaya AO, Irmak AY (2021) Relationship between parenting practices and children's screen time during the COVID-19 pandemic in Turkey. *J Pediatr Nurs* 56:24–29. doi:<https://doi.org/10.1016/j.pedn.2020.10.002>
- Burkart S, Parker H, Weaver RG, Beets MW, Jones A, Adams EL, Chaput J, Armstrong B (2021) Impact of the COVID-19 pandemic on elementary schoolers' physical activity, sleep, screen time and diet: A quasi-experimental interrupted time series study. *Pediatr Obes* 18:e12846. doi:<https://doi.org/10.1111/ijpo.12846>
- Xiang M, Zhang Z, Kuwahara K (2020) Impact of COVID-19 pandemic on children and adolescents' lifestyle behavior larger than expected. *Prog Cardiovasc Dis* 63:531–532. doi: <https://doi.org/10.1016/j.pcad.2020.04.013>
- Velde G, Lubrecht J, Arayess L, Loo C, Hesselink M, Reijnders D, Vreugdenhil A (2021) Physical activity behaviour and screen time in Dutch children during the COVID-19 pandemic: Pre-, during- and post-school closures. *Pediatr Obes* 16:e12779. doi: <https://doi.org/10.1111/ijpo.12779>
- Park JH, Park JY, Jin KS (2021) What did COVID-19 Change? The Impact of COVID-19 on Korean Parents' and Children's Daily Lives and Stress. *Child Psychiatry Hum Dev* 53:172–182. doi: <https://doi.org/10.1007/s10578-021-01262-y>
- Langer SL, Crain L, Senso MM, Levy RL, Sherwood NE (2014) Predicting Child Physical Activity and Screen Time: Parental Support for Physical Activity and General Parenting Styles. *J Pediatr Psychol* 39:633–642. doi: <https://doi.org/10.1093/jpepsy/jsu021>

13. Lin CY (2020) Social reaction toward the 2019 novel coronavirus (COVID-19). *J Health Soc Behav* 3:1–2. doi:https://doi.org/10.4102/SHB.SHB_11_20
14. Korajlija AL, Jokic-Begic N (2020) COVID-19: Concerns and behaviours in Croatia. *Br J Health Psychol* 24:849–855. doi:<https://doi.org/10.1111/bjhp.12425>
15. Remmerswaal D, Muris P (2011) Children's fear reactions to the 2009 Swine Flue pandemic: the role of threat information as provided by parents. *J Anxiety Disord* 25:444–449. doi: <https://doi.org/10.1016/j.janxdis.2010.11.008>
16. Rubin GJ, Amlôt R, Page L, Wessely S (2009) Public perceptions, anxiety, and behaviour change in relation to the Swine flu outbreak: Cross sectional telephone survey. *BMJ* 339:b2651. doi: <https://doi.org/10.1136/bmj.b2651>
17. Brock RL, Laifer LM (2020) Family science in the context of the COVID-19 Pandemic: solutions and new directions. *Fam Process* 59:1007–1017. doi: <https://doi.org/10.1111/famp.12582>
18. American Psychological Association. Stress in the time of COVID-19 (2020) Available from: <https://www.apa.org/news/press/releases/stress/2020/report>
19. Russell BS, Hutchison M, Trampling R, Tomkunas AJ, Horton AL (2020) Initial challenges of caregiving during COVID-19: caregiving burden, mental health, and the parent-child relationship. *Child Psychiatry Hum Dev* 51:671–682. doi: <https://doi.org/10.1007/s10578-020-01037-x>
20. Ones L (2020) The COVID-19 pandemic: a family affair. *J Fam Nurs* 26:87–89. doi: <https://doi.org/10.1177/1074840720920883>
21. Galea S, Ahern J, Resnick H, Kilpatrick D (2002) Psychological sequelae of the September 11 terrorist attacks in New York City. *N Engl J Med* 346:982–987. doi: <https://doi.org/10.1056/NEJMsa013404>
22. Burdette HL, Whitaker RC, Kahn RS, Harvey-Berino JK (2003) Association of maternal obesity and depressive symptoms with television-viewing time in low-income preschool children. *Arch pediatr adolesc med* 157:894–899. doi: <https://doi.org/10.1001/archpedi.157.9.894>
23. Kerns CE, Elkins RM, Carpenter AL, Chou T, Green JG, Comer JS (2014) Caregiver distress, shared traumatic exposure, and child adjustment among area youth following the 2013 Boston marathon bombing. *J Affect Disord* 167:50–55. doi: <https://doi.org/10.1016/j.jad.2014.05.040>
24. Karki U, Dhongju G, Kunwar AR (2020) Parenting during the COVID-19 pandemic. *JNMA J Nepal Med Assoc* 58:957–959. doi:<https://doi.org/10.31729/jnma.5319>
25. World Health Organization. (n.d.- b). Self-care. Available from <https://www.who.int/reproductivehealth/self-care-interventions/definitions/en/>
26. Butler LD, Merced KA, McClain-Meeder K, Horne DM, Dudley M (2019) Six domains of self-care: attending to the whole person. *J Hum Behav Soc Environ* 29:107–124. doi: <https://doi.org/10.1080/10911359.2018.1482483>
27. Yau YH, Potenza MN (2013) Stress and eating behaviors. *Minerva Endocrinol* 38:255–267 PMID: 24126546
28. Zeigler Z (2021) COVID-19 self-quarantine and weight gain risk factors in adults. *Curr Obes Rep* 10:423–433. doi: <https://doi.org/10.1007/s13679-021-00449-7>
29. Cassinat JR, Whiteman SD, Serang S, Dotterer AM, Mustillo SA, Maggs JL, Kelly BC (2021) Changes in family chaos and family relationships during the COVID-19 pandemic: Evidence from a longitudinal study. *Dev Psychol* 10:1597–1610. doi: <https://doi.org/10.1037/dev0001217>
30. Praso S (2020) China's divorce spike is a warning to rest of locked-down world Available from: <https://www.bloomberg.com/news/articles/2020-03-31/divorces-spike-in-china-after-coronavirus-quarantines>
31. Kim J, Kim T (2021) Family formation and dissolution during the COVID-19 pandemic: evidence from South Korea. *Glob Econ* 51:1–19. doi: <https://doi.org/10.1080/1226508X.2021.1874466>
32. Pulkki-Raback L, Barnes JD, Elovainio M, Hakulinen C, Sourander A, Tremblay MS, Guerrero MD (2022) Parental psychological problems were associated with higher screen time and the use of mature-rated media in children. *Acta Paediatr*. doi: <https://doi.org/10.1111/apa.16253>
33. Halpin S, Mitchell AE, Baker S, Morawska A (2021) Parenting and child behaviour barriers to managing screen time with young children. *J Child Fam Stud* 30:824–838. doi: <https://doi.org/10.1007/s10826-020-01881-4>
34. Lauricella AR, Wartella E, Rideout VJ (2015) Young children's screen time: the complex role of parent and child factors. *J Appl Dev Psychol* 36:11–17. doi: <https://doi.org/10.1016/j.appdev.2014.12.001>. 0193–3973
35. Wong RS, Tung KT, Rao N, Leung C, Hui AN, Tso WW, Ip P (2020) Parent technology use, parent-child interaction, child screen time, and child psychosocial problems among disadvantaged families. *J Pediatr* 226:258–265. doi: <https://doi.org/10.1016/j.jpeds.2020.07.006>
36. Capri T, Gugliandolo MC, Iannizzotto G, Nucita A, Fabio RA (2021) The influence of media usage on family functioning. *Curr Psychol* 40:2644–2653. doi: <https://doi.org/10.1007/s12144-019-00204-1>
37. Pyper E, Harrington D, Manson H (2016) The impact of different types of parental support behaviours on child physical activity, healthy eating, and screen time: a cross-sectional study. *BMC Public Health* 16:1–15. doi: <https://doi.org/10.1186/s12889-016-3245-0>
38. Zhao J, Zhang Y, Jiang F, Ip P, Ho FKW, Zhang Y, Huang H (2018) Excessive screen time and psychosocial well-being: the mediating role of body mass index, sleep duration, and parent-child interaction. *J Pediatr* 157–162. doi: <https://doi.org/10.1016/j.jpeds.2018.06.029>
39. Wolf EJ, Harrington KM, Clark SL, Miller MW (2013) Sample size requirements for Structural Equation Models: An evaluation of power, bias, and solution propriety. *Educ Psychol Meas* 76:913–934. doi: <https://doi.org/10.1177/0013164413495237>
41. Kline RB (2016) Methodology in the social sciences. Principles and practice of structural equation modeling, 4th edn. Guilford Press
42. MacKinnon DP, Lockwood CM, Hoffman JM, West SG, Sheets V (2002) A comparison of methods to test mediation and other intervening variable effects. *Psychol* 7:83–104. doi: 10.1037.1082-989X.7.1.83
43. World Health Organization. Depression. Available from: https://www.who.int/health-topics/depression#tab=tab_1
44. Schimmenti A, Billieux J, Starcevic V (2020) The four horsemen of fear: an integrated model of understanding fear experiences during the COVID-19 pandemic. *Clin Neuropsychiatry* 17:41–45. doi: <https://doi.org/10.36131/CN20200202>
45. Lee YJ (2016) The extended family: disharmony and divorce in Korea. Divorce, Separation, and Remarriage: The Transformation of Family. Emerald Group Publishing Limited
46. Peurifoy RZ (1999) Anger: taming the beast: a step-by-step program for people with explosive anger and those who find it difficult to express anger. Kodansha Amer Incorporated
47. Barker M (2010) Self-care and relationship conflict. *Sex Relatish Ther* 25:37–47. doi: <https://doi.org/10.1080/14681990903479904>
48. Park SK, Kim JY, Choon BC (2008) Prevalence of internet addiction and correlations with family factors among South Korean adolescents. *Adolesc* 43:895–909 PMID: 19149152
49. Kennedy CM, Stzempko F, Danford C, Kools S (2002) Children's perceptions of TV and health

- behavior effects. *J Nurs Scholarsh* 34:289–294. doi: <https://doi.org/10.1111/j.1547-5069.2002.00289x>
50. Shaw M, Black DW (2008) Internet Addiction: Definition, Assessment, Epidemiology and Clinical Management. *CNS Drugs* 22:353–365. doi: <https://doi.org/10.2165/00023210-200822050-00001>
 51. Lee SA, Park E, Ju YJ, Han K, Yoon HJ, Kim TH (2018) The association between satisfaction with husband's participation in housework and suicidal ideation among married working women in Korea. *Psychiatry Res* 261:541–546. doi: <https://doi.org/10.1016/j.psychres.2018.01.039>
 52. Dugan AG, Barnes-Farrell JL (2016) Working mothers' second shift, personal resources, and self-care. *Community Work Fam* 23:62–79. doi: <https://doi.org/10.1080/13668803.2018.1449732>
 53. Thibaut F, van Wijngaarden-Cremers PJM (2020) Women's mental health in the time of COVID-19 pandemic. *Front Glob Womens Health* 08. doi: <https://doi.org/10.3389/fgwh.2020.588372>
 54. Palkovitz R, Trask BS, Adamsons K (2014) Essential differences in the meaning and processes of mothering and fathering: family systems, feminist and qualitative perspectives. *J Fam Theory* 6:406–420. doi: <https://doi.org/10.1111/jft.12048>
 55. Schinkel MG, Chambers CT, Caes L, Moon EC (2014) A comparison of maternal versus paternal nonverbal behavior during child pain. *Pain Prac* 17:41–51. doi: <https://doi.org/10.1111/papr.12415>
 56. Kim KW, Wallander JL, Felt JM, Elliott MN, Schuster MA (2019) Associations between parental general monitoring and adolescents' weight status: mediation via physical activity and dietary intake. *Obes* 27:280–287. doi: <https://doi.org/10.1002/oby.22372>
 57. Vanderloo LM, Carsley S, Aglipay M, Cost KT, Maquire J, Birken CS (2020) Applying harm reduction principles to address screen time in young children amidst the COVID-19 pandemic. *J Dev Behav Pediatr* 41:335–336. doi: <https://doi.org/10.1097/DBP.0000000000000825>

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