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Impact of the COVID-19 Pandemic on the Developmental Outcomes among Korean Kinship Foster Care Children: Gender Differences

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Abstract: (1) Background: This study explored changes before and during the COVID-19 pandemic in terms of developmental outcomes among kinship foster care children in the Republic of Korea: and gender differences in the changes; (2) Methods: The study analyzed the data of 217 kinship care children who participated in both the first- and second-wave surveys of the Panel Study of Korean Foster Care Children. As the main statistical methods, we utilized repeated-measures ANOVA and analysis of covariance (ANCOVA); (3) Results: Analysis of developmental outcomes measured before and during the pandemic showed no significant changes. However, significant interaction effects existed between time (before and during the pandemic) and gender, indicating that boys and girls recorded different patterns of change before and during the COVID-19 pandemic; (4) Discussion: During the COVID-19 pandemic, girls experienced negative changes in most areas of development, whereas boys experienced positive changes. The policy and practical implications for foster care children in Korea were discussed.

Keywords: kinship care; foster care; gender differences; COVID-19; COVID-19 lockdown; developmental outcomes



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1. Introduction

The COVID-19 pandemic—a global health crisis—started in 2019. The resulting control and prevention measures significantly impacted social institutions and the lives of ordinary individuals. For example, the way we work has changed; there have been massive layoffs worldwide and remote working has become extremely popular. Additionally, children and families have undergone major lifestyle changes because of remote learning and a lack of childcare following school and daycare closures [1–3].

These changes suggest that the pandemic has significantly impacted child development, prompting researchers to conduct numerous studies worldwide. This study examined the impact of the COVID-19 pandemic on foster care children—an extremely vulnerable group. This study focused on kinship foster care for children, as it is the most common type of foster care in the Republic of Korea.

Gender is a crucial factor to consider when analyzing the impact of COVID-19 on child development. Stress responses and the impacts of environmental changes may differ depending on a child's gender. Previous research on child development indicates that in stressful situations, girls tend to have more internal issues such as anxiety, whereas boys tend to display externalized behaviors such as aggression [4,5]. Another study [6] showed that females tended to depend more on emotional support to cope with COVID-19 compared to males. Therefore, it is necessary to explore gender differences in child development during the COVID-19 pandemic.

Korea introduced foster care in 2003, following the recommendations of the UN Committee on the Rights of the Child (UNCRC hereafter) to provide more family-like care to children in out-of-home care [7]. Korea has been providing out-of-home care services mostly through childcare institutions. These services are now more diversified to include foster and group homes. Unlike adoption, foster care aims to bring the child back home as soon as possible and provide protection at home, which is a significant difference compared to institutional care [8]. However, previous studies [7,9] have shown that children tend to stay in foster homes for extended periods, for example, an average of eight to nine years in the case of upper elementary students in Korea.

Since the establishment of formal foster care in 2003, it has commonly been categorized into three primary types in both the child welfare academic field and practice: general foster care (non-kinship), grandparent foster care, and other relative foster care due to the jurisdiction of law. Although the categorization of the three types was removed from the law in 2021, it is still widely accepted by researchers and practitioners due to the long period of utilization of these categories. Approximately 90% of foster parents in Korea are grandparents or other relatives of the foster child [10]. Previous research [7,11,12] has suggested that foster kinship families and children in Korea do not receive proper case management. For example, case management mostly involves cash subsidies and the supply of goods, whereas accessibility to therapy and other medical services is limited [11]. The interruption of in-person social welfare services, due to the social distancing measures adopted in Korea during the pandemic, has increased the difficulties in providing welfare services to foster homes. Under such circumstances, it is highly likely that when schools and daycare centers were closed during the pandemic, kinship foster children received support from and communicated with only kinship carers and foster home family members. Therefore, we believe that changes in the kinship care environment during the pandemic will significantly impact children's development.

The fact that kinship carers are older than non-kinship foster carers or other home carers, as in the United States [13], supports our conjecture [12]. Moreover, older kinship foster carers are highly likely to experience intense parenting stress, physical and psychological health issues, financial burden, etc., which, during a crisis such as the COVID-19 pandemic, could exacerbate the foster care environment [12].

Nonetheless, most studies on COVID-19's impact on child development in Korea were conducted on non-foster care children [14,15]. Additionally, there is a lack of research comparing child development before and during the COVID-19 pandemic using longitudinal empirical data. Therefore, we conducted this study to compare the developmental outcomes of children in Korea before and during the pandemic in kinship foster care, considering the gender effect.

Our research questions are as follows:

1. Are there significant changes in the developmental outcomes among children in kinship foster care before and during the pandemic?
2. Are there gender differences in the changes in the developmental outcomes among children in kinship foster care before and during the pandemic?

2. Literature Review

2.1. Kinship Foster Care in Korea

In the 1980s, Korea witnessed a rapid increase in family breakdown due to the urbanization and industrialization that occurred since the 1960s. Prior to that, Korea had been primarily an agricultural society for a long time, characterized by a strong emphasis on familism. However, urbanization and industrialization prompted population migration in pursuit of jobs and individualization. Both these trends led to weakened family ties and bonds. The family breakdown resulting from these changes in society has imposed a significant burden on childcare institutions responsible for receiving and safeguarding children from fragmented family backgrounds. The number of childcare institutions has grown over time and has traditionally been the primary choice for children in care [16].

However, as previously mentioned, a significant shift in Korea's out-of-home care services occurred after the recommendation of the UNCRC in 2003. In response, the government introduced formal family foster care to align with the UNCRC's guidance. Additionally, revisions were made to the Child Welfare Act to provide legal support for formal foster care [7,17].

This legal support resulted in a significant increase in foster care placements, with many of these placements being based on kinship. This increase was also motivated by the inclusion of "child-headed families" into the foster care system. As defined by the government, "child-headed families" referred to families in which individuals under 18 years of age lacked their biological parents and assumed the responsibility, in the absence of their parents, of caring for cohabiting grandparents or other relatives who were unable to work due to incapacity or illness. These children took on responsibilities associated with running the household, covering both the emotional and economic aspects of functioning as the head of the household. The government provided financial assistance to child-headed families with the primary aim of ensuring essential living conditions, though lacking appropriate social work services, including out-of-home care services [16]. For this reason, child-headed families were not recognized as informal care arrangements or suitable government interventions. Criticism from both domestic and international sources prompted the government to view kinship care as a viable alternative [7]. However, this transition primarily involved renaming "child-headed families" as foster care homes, without necessarily relocating vulnerable children to appropriate foster care environments [7,17].

At present, there are no longer any child-headed families in Korea that could transition into kinship care. However, the majority of foster carers continue to be grandparents or other relatives. This inclination can be attributed to traditional culture's emphasis on bloodlines. Particularly, older adults often feel a sense of responsibility to care for children who share their own bloodline [12].

To date, kinship care accounts for 90.3% of all foster care homes, whereas non-kinship care accounts for 8–9%. The 2021 statistics on foster children show that 6468 children (65.4%) are cared for by grandparents, and 2466 children (24.9%) by other relatives who are related by blood or via parents' marriage [10]. The children in grandparent foster care account for 0.12% of the total child population, and the children in other relative foster care account for 0.04% [18,19].

Foster care service in Korea is managed by the Ministry of Health and Welfare (MOHW), the National Center for the Rights of the Child (NCRC), and foster care support centers. Foster care support centers and non-governmental organizations oversee cases of foster homes and foster children's parents. According to the 2021 statistics, there are 18 foster care support centers nationwide and 225 case managers. On average, each center has six case managers, one therapist, and one independent living coordinator [10].

One case manager manages an average of 84 foster care children, 69 foster homes, and 5271 cases annually, which is a heavy workload [10]. Owing to the large volume of kinship cases assigned to a single manager, the kinship foster carer and children do not receive proper services and support. For example, services and support for the kinship carer primarily include counseling via phone and in-cash or in-kind support [13,20–22]. Case managers tend to provide more face-to-face counseling, home visit services, and referrals to therapy services to non-kinship foster families to retain them [11]. Moreover, kinship carers tend to be older, with less education and income compared to non-kinship carers [22]. Such disparities are also evident in the kinship foster care status of other countries, including the United States, the United Kingdom, and Australia [23,24].

Researchers in Korea [7,11,12] have mainly compared the developmental outcomes of kinship and non-kinship foster children because, despite their high representation, kinship foster care homes are not adequately managed or supported. This results in a poorer environment for children in kinship foster care, compared to general foster care.

Earlier studies indicated that children in kinship foster care show less anxiety, aggression, and delinquency, as well as more positive developmental outcomes compared

to their peers in general foster care [25]. However, later research [26] has suggested that kinship carers experience extreme parenting stress, which lowers family adaptability, and, in turn, exacerbates the foster child's behavioral problems. A longitudinal analysis [12] found that when children were first placed in foster homes, those in kinship foster care showed better developmental outcomes in most aspects compared to those in general foster care. However, over time, the latter group showed better developmental outcomes than the former group. A comparative study of the five-year developmental outcomes of children in kinship foster care and childcare institutions [9] reported similar results. At baseline, foster children in kinship foster placements outperformed their peers in childcare institutions. However, the achievement gap gradually decreased, and those in institutions showed even better results in certain areas [9]. Against this backdrop, where foster children in kinship foster care exhibit more negative developmental outcomes than those in general foster care, it is necessary to determine how the COVID-19 pandemic has impacted their development. Additionally, in Korea, very few studies have considered gender a significant variable when analyzing the developmental outcomes of kinship foster care children. Therefore, it is imperative to identify the impacts of the pandemic on the development of kinship foster children and gender disparities to improve child welfare intervention strategies.

2.2. COVID-19 and the Development of Children in Foster Care

Many studies have indicated that the pandemic has had a more negative impact on children and youth than on adults. Children had to stay at home for an extended duration; they could not go to school, lacked peer interaction and physical activities, and endured various stressful restrictions [27–29]. Additionally, the pandemic severely impacted children receiving out-of-home care; for example, childcare disruptions increased foster parents' stress and parenting and financial pressures, which in turn increased the risk of foster care termination or rejection. Uncertainties surrounding school and day care also limited double-income foster parents' foster care capabilities [30–32]. Conflicts between foster parents and children also escalated because social distancing measures required them to spend more time at home. Children who had newly entered foster homes during the COVID-19 pandemic struggled to adapt and felt isolated because of poorer access to in-person services from foster care or social workers and a reduction in social support amidst increasing financial burden [31].

Foster parents' stress and parenting pressure increased because of the pandemic-related strain on the childcare system. Additionally, childcare problems especially hurt the finances of working foster parents. These pandemic-induced circumstances increased the risk of foster care placement disruption [30,33]. Additionally, family reunification rates dropped because meetings between foster children and their parents were limited. Face-to-face interactions were also restricted, and infected children were rejected for foster care. Such experiences negatively impacted child development [34–36].

The COVID-19 pandemic has negatively impacted the psychosocial adaptation of foster children. Many foster children are already exposed to a high risk of internalizing and/or externalizing behavioral problems because of their circumstances; for example, separation from family or abuse [37,38]. Additionally, the pandemic has increased the psychological risks to children. Children in foster care reported greater psychological and emotional distress, including depression, anxiety, fear, post-traumatic stress disorder (PTSD), and irritation [39–44]. These psychological changes and stress tend to transform into external behaviors, such as aggression, rage, and attention deficiency, which deteriorate one's quality of life [28,45]. Moreover, foster children were exposed to a greater risk of losing their sense of belonging, experiencing loneliness and frustration, and becoming disobedient when they could not meet their family during the pandemic [36,46].

As discussed above, the COVID-19 pandemic has impacted both the mental health of children in foster care and their educational development [47]. These children are vulnerable to learning loss because of the absence of learning opportunities or learning disruptions [42,48–53]. A study of high school students in foster care [48] showed that

school closure limited their access to their school network, which led to a loss of the sense of community and participation deficiency. School-related restrictions limited social activities, causing these children to feel helpless. They also faced developmental risks because of losing opportunities to participate in arts and sports activities, interact with teachers and peers, and access medical services and therapies [32,42,54].

The pandemic limited the access to and supply of human and material resources required by children in foster care. When foster parents failed to cope with the lack of resources, such as not being able to give children more care and attention, it aggravated the difficulties of children in need of psychological and emotional therapy [32,46,47]. Children in kinship care are typically looked after by their elderly grandparents or other older relatives. In these situations, instead of addressing the challenges of limited resources for children, older foster parents exhibited an elevated risk of experiencing caregiving instability when they contracted COVID-19 [36,55]. Kinship foster care homes that suffered pandemic-induced financial difficulties as well as parenting stress experienced even harder times [13].

Although extensive research has been conducted on the challenges faced by foster children during the pandemic, empirical studies on its impact in Korea are lacking. However, a recent qualitative study on children in institutional care [56] found that social distancing measures violated children's right to liberty, as they were unable to access learning and social welfare services and/or meet their parents. These findings highlight the severity of the pandemic's impact on socially vulnerable foster children, underscoring the need for comparative studies on developmental outcomes before and during the COVID-19 pandemic to better understand the effects of the pandemic on their psychosocial adaptation and development.

In summary, previous research has indicated that the occurrence of COVID-19 has had a significant impact on children's development. In particular, pandemics cause emotional and behavioral problems in children, such as low self-esteem, depression, anxiety, and aggression [57]. Owing to school closure, children experienced a sense of isolation and loneliness. Additionally, they lost interest in school life and their dependency on digital devices increased [14]. Based on a study that conducted a systematic review of empirical research on the negative effects of mobile phone use [58], it has been demonstrated that excessive use of digital devices has an impact on psychological problems. Furthermore, frequent use of mobile devices has been associated with adverse effects on children's emotional and behavioral adjustment [59].

Thus, to analyze the impact on children's development, we examined various psychological and behavioral outcomes based on the existing literature, including self-esteem, school adjustment, depression/anxiety, social withdrawal, aggression, attention deficit, and cellphone dependency.

2.3. Gender Differences in Children's Development during Disaster

Children are more vulnerable than adults to crises, and therefore, more negatively impacted [60]. The United Nations Development Programme (UNDP) estimates that women and children are 14 times more likely to die from a crisis or disaster than male adults [61]. Additionally, boys and girls are affected differently by disasters. For example, in the wake of Hurricane Katrina in the United States, more girls reported PTSD symptoms than boys [62]. Girls are more likely to exhibit PTSD symptoms after a disaster, and their symptoms tend to be related to mood and anxiety [63]. A survey conducted three months after the 1999 Athens earthquake revealed that girls showed higher PTSD and depression scores than boys [64]. Existing research on disasters and trauma indicates that females display more symptoms [65], and similar differences were reported for children and youth based on their gender.

An increasing number of studies indicate that the impact of the COVID-19 pandemic manifested differently in children, depending on their gender. For example, a Japanese study [66] found that more boys experienced behavioral problems, such as hyperactivity

and trouble with peers, than girls, whereas more girls experienced emotional symptoms, such as anxiety related to learning loss. A British study [67] indicated that the pandemic's impact on mental health was greater for girls than for boys and found a negative correlation between gender disparities and family income. A study on children in the Asia-Pacific region [68] showed that female youth were more concerned about the pandemic compared to their male peers.

Children living in residential care showed similar patterns during the lockdown. Girls were more negatively affected compared to males in terms of social relationships. As they could not attend school, they experienced a sense of drifting away from their friends. They were also dissatisfied with online interactions, and felt a stronger sense of loneliness compared to boys [69].

A few researchers [14,15] in Korea have attempted to identify the impact of the pandemic on child development; however, these studies were not based on data measured before and during the pandemic. Previous studies have suggested that changes in the usual life pattern during the pandemic increased children's stress, and this increase was more pronounced among children from low-income families [14]. According to a similar study conducted during the pandemic, girls experienced more anxiety and stress compared to boys [15].

To sum up, disasters such as the COVID-19 pandemic negatively affect the children and youth. Previous studies from home and abroad have indicated that girls are more negatively impacted and display more internalizing behaviors, such as depression and anxiety, compared to boys [63,67].

Additionally, in the context of kinship care in Korea, we have to explore whether kinship foster parents, who are generally older than non-kinship foster parents, respond differently to children's gender during a disaster. Given the longstanding influence of Confucianism, ideas of prominence of men over women and traditional gender stereotypes could still remain, especially among the older generation [70,71]. Moreover, relevant studies [72,73] have reported that older individuals, those who are married, and individuals with lower levels of education and income are more inclined to uphold traditional gender stereotypes. These studies specifically highlight that individuals with socio-economic backgrounds akin to kinship caregivers tend to exhibit more pronounced stereotypes compared to other segments of the population. Consequently, it is reasonable to assume that the kinship care population could hold particularly strong traditional gender stereotypes.

Furthermore, the impact of traditional gender stereotypes upheld by kinship caregivers might have influenced children's beliefs and behaviors at home. According to a study [70], children who have lived with their grandparents tend to display more pronounced gender role stereotypes compared to children who have not, showcasing a stronger inclination towards the traditional belief that males should be breadwinners, while females should take on the role of housewives and caregivers within a patriarchal framework.

Therefore, to effectively intervene to provide kinship foster care for children in Korea who have experienced disasters, it is crucial to first analyze gender differences, and thereafter, devise appropriate intervention and policy.

3. Methods

3.1. Study Participants and Data Collection

This study analyzed the first-wave data (collected in 2019) and second-wave data (collected in 2020) of the Panel Study of Korean Foster Care Children. Utilizing a self-report survey, the panel study was structured to facilitate a longitudinal follow-up of foster children starting from their childhood (elementary school years), if possible, and extending through their adolescence (middle and high school years) up to their adulthood [74].

In coordination with the National Foster Care Support Center in 2019, a reasonable sample size was estimated based on the list of children in foster care aged between 10 and 13 years. This age range was chosen because it is believed to encompass the youngest group that is developmentally capable of comprehending and participating in the self-

report survey among children. This particular age group, which includes upper-elementary students (typically 4th- to 6th-graders), has consistently been selected as a sample for the initial phase of various longitudinal panel studies focused on children. These studies involve subsequent follow-ups that extend into their adolescent years. These studies include the Korean Children and Youth Panel Survey, as well as the Korea Welfare Panel Study—children survey).

The sample was stratified based on three types of foster care in Korea: grandparent, other relative, and general foster care. The sample was further stratified based on 17 regions and allocated in proportion to the square root of the foster children population [74].

If a child in the sample agreed to participate in the study, trained survey interviewers visited the child's foster home, and the children completed the survey with the assistance of interviewers in their private place, separate from the foster parents. For the first wave, the target number of the panel was 300, and 305 foster care children were gathered. The second-wave group comprised 287 children, including 259 from the first panel and 28 alternative samples. This study analyzed the data of 217 kinship care children (152 in grandparent foster care and 65 in other relative foster care) who participated in both the first- and second-wave surveys.

3.2. Measures

3.2.1. Positive Developmental Outcomes: Self-Esteem and School Adjustment

As indicators of positive developmental outcomes, we selected self-esteem and school adjustment. Self-esteem has been explored as an indicator of positive results and a reflection of inner individual strength within the realm of child development. Specifically, self-esteem has garnered attention in relation to the development of children with disadvantaged backgrounds, as it has the potential to influence and be influenced by various aspects of children's lives, including social interactions [75] and mental health [76,77].

Another indicator of positive developmental outcomes that has been extensively investigated in prior research is school adjustment and connectedness. This achievement has been perceived as a marker of resilience and positive results for vulnerable children, including those in out-of-home care or who have experienced abuse [78–81].

To measure self-esteem, we used 10 items from the Rosenberg self-esteem scale [82]. The items were rated on a 4-point Likert scale (1 = "strongly disagree" to 4 = "strongly agree"). Cronbach's alphas for the first and second waves were 0.804 and 0.848, respectively. Children's school adjustment was measured using nine items rated on a 4-point Likert scale. These items have been utilized in many panel studies on children (e.g., the Seoul Panel Study of Children and the Foster Care Panel Study [83]). The Cronbach's alphas for the first and second waves were 0.743 and 0.771, respectively.

3.2.2. Negative Developmental Outcomes: Depression/Anxiety, Social Withdrawal, Aggression, Attention Deficiency, and Dependency on Cellphone

To assess adverse developmental outcomes in children, we included the socio-emotional aspect and behavioral issues. Numerous preceding studies that center around the developmental outcomes of children in out-of-home care [84–87] have gauged similar dimensions using the CBCL. These dimensions encompass depression/anxiety, social withdrawal, aggression, and attention deficiency. We employed a three-scale question approach derived from the Korean Child Behavior Checklist (K-CBCL), originally developed by Achenbach [88] and translated by Oh et al. [89], to assess these indicators.

Additionally, following the occurrence of the pandemic, the excessive use of cellphones among children has become a significant concern, as highlighted in international studies [90] and domestic research [14]. Therefore, we included excessive cellphone use as an indicator of negative outcomes.

The K-CBCL elicits responses to 13 statements to measure depression and anxiety, including "I complain of loneliness", and "I cry easily". Cronbach's alphas for the first and second waves were 0.807 and 0.862, respectively. To measure social withdrawal,

responses to nine statements were elicited, including, “I have many secrets”, and “I do not talk openly about my feelings with others”. The Cronbach’s alphas for the first and second waves were 0.741 and 0.840, respectively. Aggression was measured by eliciting responses to 19 statements, including “I’m cruel to animals”, and “I frequently get into fights”. Cronbach’s alphas for the first and second waves were 0.801 and 0.830, respectively. To measure attention span, responses to 10 statements were elicited, including, “I have a short attention span and cannot focus on a task for a long time” and “I’m impulsive and act before thinking”. The Cronbach’s alphas for the first and second waves were 0.811 and 0.817, respectively.

To measure children’s cellphone dependency, we sought responses of agreement or disagreement to seven statements that were developed by Lee et al. [91] and used in the Korean Children and Youth Panel Survey. Responses were rated on a 4-point Likert scale (1 = “strongly disagree” to 4 = “strongly agree”), and the statements included, “I feel anxious going out without carrying my cellphone”, and “I can’t stand the boredom of not having a cellphone when I’m alone”. The Cronbach’s alphas for the first and second waves were 0.863 and 0.875, respectively.

3.2.3. Covariates: The Duration of Foster Care, the Number of Foster Care Placements, the Presence of Living Father/Mother, and the Presence of Developmental Difficulties

We included variables concerning the history of children’s placements in out-of-home care as control factors, drawing from pertinent prior research [87,92], which demonstrated that history significantly affects various domains of children’s developmental outcomes. The variables linked to placement history in our study encompass the duration of foster care and the frequency of foster care placements.

Furthermore, we included the factor of having a living father and/or mother in our analysis to account for its influence. Previous research [93–96] indicates that the presence of living biological parents can impact the well-being of children in out-of-home care, as their attitudes towards the care and substitute caregivers become significant. We have represented these variables using binary codes (father and/or mother alive: 1; not alive: 0).

Lastly, to address potential effects of children’s developmental difficulties on their overall outcomes, we considered whether the child had a disorder, disability, or chronic disease (coded as yes, 1; no, 0). Previous studies [97,98] have raised concerns about the higher prevalence of physical health issues among foster children and the potential negative influence on their well-being.

3.3. Statistical Analysis Methods

To analyze individual and gender group differences in developmental outcome changes during the COVID-19 pandemic, a mixed-design repeated measures ANOVA was utilized as the major statistical method. Repeated-measures ANOVA could reduce the statistical errors that occur when the research data are obtained by observing the same participants repeatedly at multiple points [99,100].

In the mixed design, at least two independent variables are required [99]. In our research, time (two measuring points of two panel waves, before and during the COVID-19 pandemic) and gender groups were the independent variables. The results of the repeated measures ANOVA can be verified by referring to the F value or adjusted F value based on the assessment of whether the assumption of sphericity was met [101]. However, in our design, the independent variables have only two options (i.e., before or during the COVID-19 pandemic for time variables, and boy or girl for gender group variable). In this situation, sphericity is not an issue to consider, and we can simply refer to the F value as the results of the repeated-measures ANOVA [99]. Additionally, we conducted an analysis of covariance (ANCOVA) to test the gender differences during the first and second waves, controlling for possible covariates.

4. Results

4.1. Descriptive Analysis

Table 1 presents the descriptive analysis results. The results are from the first-wave data, except for foster home changes. The results show that the mean age was 11.89, and that the proportion of boys (54.8) was higher than that of girls (45.2%). Over 9% of the children had developmental difficulties, including disorders and chronic diseases. Among the kinship-care children, 64.5% and 62.2% reported that their fathers and mothers were alive, respectively. The children stayed in foster care for 4.66 years on average. The mean number of foster home changes during the second wave was 1.12. The test of group differences according to gender showed significance in having the mother alive ($p < 0.01$). A total of 70.6% of the boys responded that their mothers were alive compared to 52% of the girls.

Table 1. Descriptive analysis results.

	Age N (%)	Developmental Difficulties n (%)		Having a Father n (%)		Having a Mother n (%)		Mean Years in Foster Care (SD)	Mean Placement Changes (SD)
		Yes	No	Yes	No	Yes	No		
Overall (n = 217)	11.89 (0.95)	20 (9.2)	197 (90.8)	140 (64.5)	77 (35.5)	135 (62.2)	82 (37.8)	4.66 (2.39)	1.12 (0.37)
Boys (n = 119)	11.90 (0.94)	10 (8.5)	108 (91.5)	76 (63.9)	43 (36.1)	84 (70.6)	35 (29.4)	4.52 (2.24)	1.11 (0.36)
Girls (n = 98)	11.87 (0.97)	10 (10.1)	89 (89.9)	64 (65.3)	34 (34.7)	51 (52.0)	47 (48.0)	4.83 (2.57)	1.12 (3.39)
Analysis of difference (χ^2 test/t-test)	t = 0.163	$\chi^2 = 0.170$		$\chi^2 = 0.049$		$\chi^2 = 7.864^{***}$		t = -0.216	t = -0.770

(*** < 0.001).

4.2. Gender Differences in Each Wave

To analyze gender differences in each wave, we conducted an ANCOVA while controlling for the following variables: the presence of developmental difficulties, presence of living birth father/mother, duration of stay in foster care, and number of foster care placements (see Table 2). Gender was coded dichotomously (boy: 0; girl: 1). The results showed statistically significant gender differences in aggression and attention deficiency in the first wave, which was measured before the COVID-19. Boys displayed higher aggression ($F = 6.737^*$) and attention deficiency ($F = 3.956^*$) compared to girls. This implies that in the first wave, boys scored higher than girls on negative developmental outcomes (see Table 2).

Table 2. The results of the tests of group differences (ANCOVA) and the repeated-measures ANOVA.

		Self-Esteem	School Adjustment	Depression/ Anxiety	Social Withdrawal	Aggression	Attention Deficiency	Cellphone Dependency
Test of between subjects^a (1st wave)	Boys' mean (SD)	3.14 (0.48)	3.33 (0.41)	1.25 (0.30)	1.37 (0.32)	1.21 (0.22)	1.32 (0.34)	2.03 (0.65)
	Girls' mean (SD)	3.20 (0.43)	3.39 (0.40)	1.20 (0.29)	1.31 (0.31)	1.15 (0.16)	1.25 (0.27)	2.06 (0.68)
	F value	1.120	1.273	1.652	1.254	6.737 *	3.956 *	0.100
Test of between subjects^b (2nd wave)	Boys' mean (SD)	3.26 (0.49)	3.42 (0.39)	1.15 (0.20)	1.31 (0.36)	1.13 (0.20)	1.22 (0.28)	1.93 (0.60)
	Girls' mean (SD)	3.13 (0.48)	3.35 (0.40)	1.19 (0.25)	1.37 (0.39)	1.13 (0.15)	1.28 (0.31)	2.20 (0.64)
	F value	3.972 *	1.940	2.841	2.020	0.106	1.525	9.615 **

Table 2. Cont.

	Self-Esteem	School Adjustment	Depression/Anxiety	Social Withdrawal	Aggression	Attention Deficiency	Cellphone Dependency
Significance in changes over time (F value)	0.083	0.047	0.649	3.901	0.016	0.776	0.765
Interaction effect (time × gender) (F value)	8.853 **	0.500 *	7.138 **	4.780 *	5.431 *	9.767 **	12.223 **

** < 0.01, * < 0.05; ^a test of the difference between group means adjusted for the covariates: the presence of developmental difficulties, the duration of foster care, the number of foster care placements, and the presence of living father/mother; ^b group mean adjusted for the covariates: the presence of developmental difficulties, the duration of foster care, the number of foster care placements, and the presence of living father/mother.

The results of the ANCOVA conducted for the second wave, which was measured during the COVID-19 pandemic, indicated statistically significant gender differences in self-esteem and dependency on the cellphone. Specifically, boys showed higher self-esteem ($F = 3.972^*$) compared to girls, whereas girls exhibited comparatively greater cellphone dependency ($F = 9.615^{**}$) (see Table 2). These results indicate that in the second wave, boys exhibited higher positive developmental outcomes, whereas girls exhibited higher negative developmental outcomes.

4.3. Changes, and Gender Differences Therein, after COVID-19

We examined the influence of time as a variable by conducting a repeated-measures ANOVA to determine significant changes over time in the developmental outcomes measured before and during the pandemic. We also examined gender differences in the changes in the developmental outcomes before and during the pandemic, which involved studying the interaction effects of time and gender variables. We did not find any significant difference in developmental outcomes before and during the pandemic. However, we discovered interesting results regarding gender differences over time. In most areas of development, we observed significant interaction effects between time and gender, indicating significant gender differences in developmental outcome changes before and during the pandemic.

Analysis of developmental outcomes without considering gender revealed identical results before and during the COVID-19 pandemic. However, when we analyzed the data by gender, significant differences were observed in the changes over time in all areas of development.

Regarding positive developmental outcomes, for example, self-esteem and school adjustment, there was no significant difference before and during the pandemic when the data were analyzed without considering gender. However, when we analyzed the data by gender, both self-esteem ($F = 8.853^{**}$) and school adjustment ($F = 0.500^*$) showed significant differences (Table 2).

Figure 1 presents the results of the self-esteem assessment and illustrates the significant results of the time–gender interaction. In the first wave, boys recorded lower self-esteem compared to girls; however, in the second wave, boys outscored girls. Measurements during the COVID-19 pandemic showed that girls' self-esteem levels decreased compared to their levels before the pandemic, whereas the scores for boys increased. The school adjustment levels exhibited similar patterns.

Negative developmental outcomes were similar to positive developmental outcomes because there was no significant difference between the results in all areas, including depression/anxiety, social withdrawal, aggression, attention deficiency, and dependency on cellphone, both before and during the pandemic. However, when the data were analyzed by gender, all variables showed significant differences between the periods before and during the pandemic.

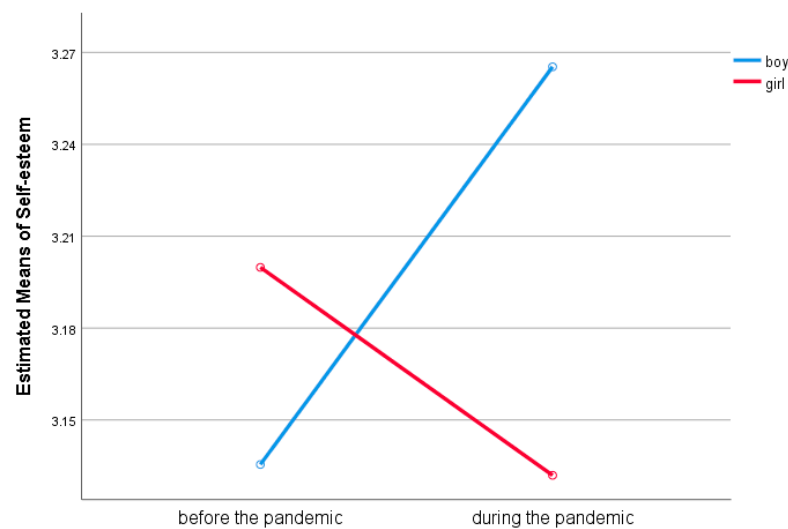


Figure 1. Gender differences in changes in self-esteem before and during the pandemic.

See the figures for a more detailed description. The levels of social withdrawal, attention deficiency, and cellphone dependency increased for girls during the pandemic but decreased for boys (see Figure 2 for social withdrawal). This result can be explained in a similar context to positive developmental outcomes. During the COVID-19 pandemic, the developmental outcomes for girls became negative, whereas those for boys became more positive. Depression/anxiety can also be explained in a similar context. The level of depression/anxiety barely changed for girls, but dramatically decreased in the case of boys. Both boys and girls showed a decrease in their respective levels of aggression, but the decrease was far greater for boys (see Figure 3).

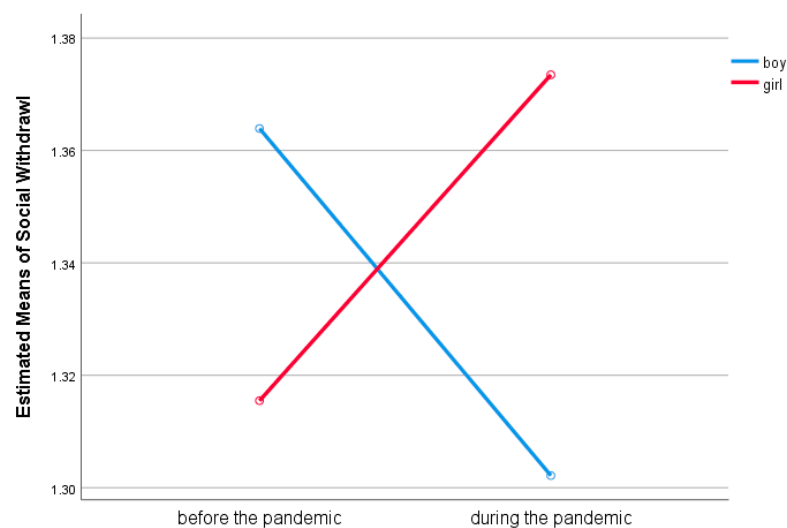


Figure 2. Gender differences in changes in social withdrawal before and during the pandemic.

To summarize, there was no significant difference in child development outcome before and during the pandemic. Nevertheless, analysis of the interaction effect between time and gender revealed differences. In fact, boys and girls exhibited opposite patterns. During the COVID-19 pandemic, girls experienced negative changes in most areas of development, whereas boys experienced positive changes in most areas of development.

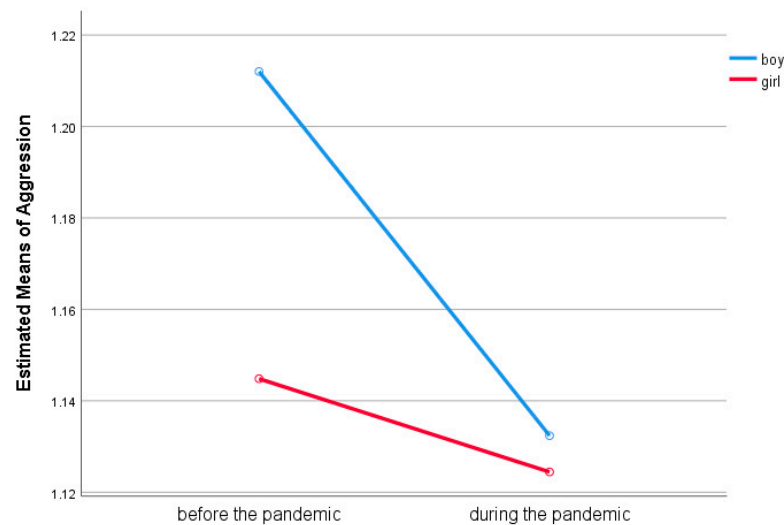


Figure 3. Gender differences in changes in aggression before and during the pandemic.

5. Discussion

This study examined the effects of the COVID-19 pandemic on children, particularly children in foster care, who constitute a vulnerable group. We considered gender as a significant variable in our analysis of the pandemic's impact on child development. When experiencing stress because of a disaster, boys and girls may respond, and be affected, differently. Therefore, we analyzed and compared changes in kinship foster care children's developmental outcomes before and during the pandemic. Additionally, we conducted a repeated-measures ANOVA to assess the effects of the time–gender interaction to identify gender differences in developmental changes.

Analysis of developmental outcomes measured before and during the pandemic showed no significant changes in the levels of self-esteem, school adjustment, depression and anxiety, aggression, delinquency, social withdrawal, and dependency on cellphones. However, analysis of the pattern of change observed over time and its interaction with gender revealed differences in all these variables. This indicates that boys and girls recorded different patterns of change before and during the pandemic.

The interaction effect is illustrated in the graph that compares the results by gender. For girls, most areas—except aggression—showed negative changes, which implies that the COVID-19 pandemic had a significant negative impact on their development. In contrast, boys experienced positive changes in most areas. Most of the graph shows an X shape, which implies that before the pandemic, the developmental outcomes of girls were more positive than those of boys. However, during the pandemic, the results became opposite—the developmental outcomes of boys became more positive than those of girls.

The results related to girls' developmental outcomes can be explained in a context similar to that of earlier studies. Girls responded more sensitively to the COVID-19 situation, and were therefore more vulnerable compared to boys.

However, in the case of boys, positive changes in developmental outcomes in most areas can be considered a highly unexpected result. These results can be explained in several ways. First, as a response to the pandemic, schools were closed and replaced with online classes, resulting in children spending more time at home. According to a study on changes in children's daily lives during the COVID-19 pandemic [58], children from lower social classes spent more time alone at home and reported an extended duration of media use for playing games or staying in contact with friends. The kinship foster families that took part in this study were also likely to have a lower socioeconomic status, as indicated by relevant research [22] that highlights the economic burden and lack of caregiving resources and information faced by kinship caregivers.

Therefore, it is speculated that under the circumstances of insufficient care and protection in kinship foster homes during the COVID-19 pandemic, prolonged periods of solitary

free time and the rise in social interactions through media, rather than in-person interactions, could have a notably adverse effect on the emotional and psychological well-being of girls. However, it may have had no significant impact on boys—rather, it may have provided them with even greater psychological comfort. This is because girls tend to be more relationship-oriented compared to boys. Therefore, the disruption of face-to-face relationships and communication due to COVID-19 may have had a more negative impact on girls than on boys, who are more capable of replacing in-person relationships with online relationships. For example, it is hypothesized that boys could have played more games with friends through media use without adult supervision.

Montserrat et al. [69] examined the perceptions of adolescents in residential care regarding the impact of the COVID-19 lockdown, and provided empirical support for these speculations. According to the study results, during the lockdown, girls had overall lower subjective well-being scores compared to boys, felt more lonely because of not being able to meet friends, and were less satisfied with online contact with friends. Additionally, using social networking services more frequently after the lockdown was a factor that increased the subjective well-being scores for boys, but not for girls.

Wang et al. [68] examined the impact of COVID-19 on children from low-income families in Southeast Asian countries during school closure. They showed that during the COVID-19 pandemic, girls engaged in less physical activity compared to boys and felt greater isolation, stress, anxiety about safety, and worries about their families' economic situation and education. As this was a cross-sectional study, it was not possible to accurately determine the difference between boys and girls before and during the COVID-19 pandemic. However, the results indicate that during the pandemic, girls were particularly emotionally vulnerable compared to boys. Similar results were reported in a study conducted in Korea [15].

A longitudinal study conducted in the United Kingdom comparing the periods before and during the pandemic [65] demonstrated gender differences between boys and girls. Before the pandemic, there were no gender differences in emotional and behavioral problems; however, during the pandemic, girls' emotional and behavioral problems significantly increased in most areas. This effect was even greater in lower socioeconomic groups. Additionally, similar to our findings on aggression, conduct problems decreased for both boys and girls; however, this decrease was greater for boys.

Additional insight into the unexpected results of this study can be gained by considering the context of kinship foster care in Korea. Even before the pandemic, kinship foster parents experienced heightened levels of parental stress. According to qualitative studies conducted in Korea [21,102], kinship caregivers have openly shared their experiences of having to suddenly and unwillingly assume the role of foster parents without adequate preparation. This circumstance primarily arises due to cultural pressures that enforce the responsibility of caring for kin-related children. Despite this, they received insufficient social welfare services and supports, a situation shared with various other countries such as the United States, the United Kingdom, and Australia [12,23].

Given the disadvantaged caregiving environment that was present prior to the pandemic and the potential influence of traditional gender stereotypes maintained by kinship caregivers, it is plausible that girls could have taken on the role of caregivers or supporters for kinship caregivers who might have lacked the necessary resources to care for themselves or required assistance during times of crisis. Although further research is needed to provide evidence, these potential caregiving roles and responsibilities assumed by girls may have had a detrimental impact on their development and overall well-being.

The results of this study were drawn by comparing empirical data before and during the pandemic. The results demonstrate that the impact of COVID-19 on the development of kinship care children, particularly in terms of emotional and behavioral problems, differs between boys and girls. This suggests that childcare and welfare interventions for boys and girls should be different in disaster situations, such as the COVID-19 pandemic.

In particular, interventions such as face-to-face counseling and emotional support are necessary for girls.

It is noteworthy that the time interval between the measurements before and during the pandemic was only one year. Additionally, the pandemic period measurement was taken six months after the outbreak of the COVID-19 pandemic in Korea. Therefore, further research is required to analyze the long-term effects of COVID-19 on child development. Despite these limitations, this study is significant in that it measured changes in various areas of child development before and during the pandemic using longitudinal data to reveal that these changes differ based on gender. Moreover, it examined the impact of COVID-19 on kinship foster children, which has rarely been studied in Korea. This has enabled consideration of both the direct effects of the pandemic on children and the impact of the lack of social welfare services and face-to-face services on socially vulnerable children during the pandemic.

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