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Factors affecting parent health-promotion behavior in early childhood according to family cohesion: Focusing on the COVID-19 pandemic

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ABSTRACT

Purpose: We investigated and compared the factors influencing parents' promotion of healthy behavior in young children according to their family cohesion level during the COVID-19 pandemic in South Korea.

Design and methods: This was a cross-sectional study involving 432 parents of young children (ages 1–6) in six South Korean cities (320 and 112 from the high and low family cohesion groups, respectively). We collected data using self-report questionnaires on parents' health promotion behavior, stress, risk perception due to COVID-19, positive psychological capital, and family cohesion, and analyzed it using stepwise multiple regressions with the SPSS program.

Results: The factors influencing parents' health promotion behavior differed across the family cohesion groups. For the high group, family cohesion, positive psychological capital, gender, and stress significantly affected parents' health promotion behavior (adjusted $R^2 = 0.22$, $p < 0.001$). Meanwhile, for the low group, positive psychological capital, gender, stress and parents' health status significantly affected parents' health promotion behavior (adjusted $R^2 = 0.19$, $p < 0.001$). Thus, stress, positive psychological capital, and gender were common factors of parents' health promotion behavior overall, regardless of family cohesion.

Conclusion: Our results are meaningful in finding that parents' health-related behaviors are not only affected by their individual factors, but also by family-related factors in the COVID-19 pandemic.

Practice implications: The study results may act as a base for improving family-centered intervention programs to promote healthy behaviors in both parents and young children based on personal and family cohesion factors.

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The coronavirus disease 2019 (COVID-19), having begun at the end of 2019, has now spread rapidly worldwide, affecting many populations including children and parents (Choi et al., 2020; Jung, 2020; Kim et al., 2020; WHO, 2020). As of August 2021, children aged <18 years have accounted for approximately 12.6% of COVID-19 cases worldwide (CDC, 2021).

In children, COVID-19— an infectious respiratory disease characterized by variable symptoms including severe respiratory difficulty with cough, fatigue, and shortness of breath (KDCA, 2021)—has a much higher propagation power and transmission rate than the previous epidemics, SARS and MERS (Van Chan et al., 2021). Respiratory difficulties are more likely in early childhood (1–6 years old) due to the anatomical narrowing of the airways and young children are highly susceptible to infection as their immune systems are not fully developed (Lee et al., 2017; Park et al., 2011; Wong et al., 2001). This is driving many people,

including young children and parents, into physical and psychological fear of contracting COVID-19 (Jung, 2020; Van Chan et al., 2021).

Numerous studies have shown that COVID-19 can impact overall health due to its persistent nature and that personal health behaviors can significantly influence the course of the COVID-19 pandemic (Geldsetzer, 2020; Adibelli and Sümen, 2020). Therefore, early health promotion behavior can greatly improve overall health development to prevent infectious diseases in the long term (Seo et al., 2009). In the broadest sense, health promotion behavior refers to the motivated action to realize optimal health states—including affective and emotional health—overt behavior patterns and habits related to health maintenance and improvement (Gochman, 1997; Ham, 2012). As such, regarding COVID-19, this includes not only direct actions to prevent infection, but also a set of complex behaviors aimed at promoting long-term growth and development (e.g., infection prevention, hygiene, physical activity, eating habits, safety) in a wide range of people (Adibelli & Sümen, 2020; Ham, 2012).

To promote children's health behavior, numerous research studies have emphasized parents' and families' role, since very young children are particularly vulnerable to lifestyle habits and cannot manage their

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health by themselves, including controlling their external environment. Moreover, they tend to rely extensively on parents' health-supporting behaviors (Hamilton et al., 2020; Lee & Kwon, 2009). Thus, it is crucial for parents to set an example that models healthful behavior in daily life, based on solid health knowledge and a positive attitude, thereby motivating children to behave likewise (Cho, Min, & Kim, 2018; Ham, 2012).

However, research on pediatric COVID-19 (including parents and children's health behavior during the pandemic) is limited worldwide. The focus has mainly been on adults and the elderly since, compared to them, fewer COVID-19-related cases have been reported among the pediatric population; thereby, causing the under-appreciation of the disease's impact on infants and children (Jiehao et al., 2020; Posfay-Barbe et al., 2020). Nevertheless, it is a key action for young children to be precautious: washing hands regularly with soap, wearing masks, and practicing social distancing. Furthermore, the pandemic's long-term impact on promoting children's health or health behavior is inevitable (Adibelli & Sümen, 2020).

Previous studies have focused on the necessity to examine various factors (e.g., individual and external: environmental family-related factors) to understand integrated health promotion power (Ham, 2012; Park and Kim, 2017).

Individual factors include internal psychological factors, such as positive psychological capital (including self-efficacy, hope, resilience, and optimism), an internal force that helps overcome problems while increasing adaptability to family stress (Luthans et al., 2007). These factors also include parents' stress due to COVID 19—as preschool and kindergartens across the country remain closed and social life is limited, parents responsible for the care of their children over an extended period and experiencing fear due to their child's risk of infection, inevitably suffer from anxiety and stress, which are factors considered to affect their health behavior (Bae et al., 2015; Choi et al., 2015; Joo, 2011). In addition, risk perception about COVID-19 can also play a major role as a predictor of precautionary behavior, as individuals who maintain a high level of awareness and risk perception are the most likely to adopt appropriate health behaviors (Van Chan et al., 2021).

The external factors include environmental and family-related factors such as social support and family function (Cho, Min, & Kim, 2018; Lee & Kwon, 2009). Based on the theory developed by Olson et al. (1983), family function is positively related to children's health, growth, and development. As a part of family function, family cohesion represents familial affinity between members. In families whose members share a high sense of belonging or attachment and receive sufficient affection and support, parents can place more interest in their children's health, thus, facilitating parents' and children's positive health promotion behaviors (Keltner, 1992; Mendes et al., 2016; Olson et al., 1983). Moreover, in the current COVID-19 pandemic, where many family members are experiencing stress and anxiety, family cohesion may play a more critical role than ever in the long-term promotion of young children's health.

Considering the above-mentioned studies, we can presume that family cohesion and related individual variables such as parent stress, risk perception of a COVID-19, and positive psychological capital will affect parents' health-promoting behavior, which may significantly influence their children's future health promotion and growth development, including infectious disease prevention. Since, environmental explanations can reflect the influence relationship between one person's behavior and that of another, while individual explanations alone cannot, it is crucial that we assess both factors' effects on pediatric and family health during this pandemic.

Based on this theoretical background, to understand the health-promoting behavior of parents of young children better and identify ways to enhance it, it is essential to investigate factors related to health-promoting behavior, including family function factors according to different degrees of family cohesion, which have been previously identified as essential for promoting healthy behavior, and thereby

determine how perceived factors could lead to engagement in health promotion behavior (Cho, 2004; Jeon & Kwon, 2017; Jeong, 2009).

Therefore, we aimed to identify factors influencing behavior that prevents infectious diseases and promotes sustainable health. We categorized participants into high and low family cohesion groups, according to family cohesion degree suggested by Olson et al. (1983) in the COVID-19 pandemic. Olson et al. (1983) identified four levels of family cohesion ranging from disengaged to separated (low family cohesion), connected, and enmeshed (high family cohesion).

This study can provide essential data for the timely development of family-centered health promotion programs for families and young children in the COVID-19 pandemic.

Methods

Design

This was a cross-sectional study identifying factors influencing the health-promoting behavior of parents of young children according to family cohesion during the COVID-19 pandemic.

Participants

Participants were parents of children aged one to six years in six cities: Kang-won, Gyeonggi, Chung-nam, Kyung-Sang, Chun-la, and Seoul province in South Korea. Inclusion criteria were (1) parents who understood the study's contents and could complete a questionnaire; and (2) parents of children who did not have congenital disorders, diseases with immune dysfunction, or chronic diseases. The participants confirmed that they understood the study's purpose and voluntarily agreed to participate.

The minimum number of participants required for the sample, considering our inclusion of 13 predictor variables, an effect size of 0.15, an alpha of 0.05, and a power of 0.95 for regression analysis, was 378 (189 per group). We conducted power analysis using G Power 3.1.9.7 (Faul et al., 2009) and initially distributed the questionnaires to 455 parents through an online platform (Google forms). We excluded twenty-three parents because they did not return consent forms or submitted incomplete responses. The remaining 432 participants made up the final study sample.

Procedure

The bioethics committee at our institution approved this study [IRB X-XXXXXXX-X]. We obtained approval for the recruitment announcement and data collection from parenting-related communities and SNS (Social Network System) managers across the country. We collected data through an online-based survey (which was safer than face-to-face surveys given the current pandemic) between November and December 2020 in South Korea. This coincided with the second COVID-19 wave in the country, which brought more than 500 infections per day on average.

Prior to responding to the questionnaire, we provided information on the study purpose and process and on data anonymity and confidentiality. We also confirmed that collected data would be used for research purposes only and that participants could withdraw from the study at any time. Furthermore, we explained participants to report their current mental states and thoughts on each measure given the recent COVID-19 situation suitable for the purpose of the study. We also provided information that for participants that reported emotional difficulties and mental discomfort due to participating on our survey, we would provide a link to the Korean Red Cross's "Corona 19 psychological counseling bulletin board" site, where we could officially help, or the "psychological and emotional counseling service" operated by the Ministry of Gender Equality and Family in South Korea.

An online questionnaire was then distributed and completed only by participants who agreed to participate. We provided a small gift to the subjects as a token of appreciation for their participation.

Measures

Stress in the coronavirus pandemic context

To measure participant stress levels, we used the Korean version of the Perceived Stress Scale (PSS) developed by Cohen (1988) and translated by Lee et al. (2012). This tool considers social factors or situations related to stress rather than stress itself, with higher perceived stress resulting in a higher total score. There were 10 questions in total, each scored on a 5-point Likert scale ranging from 1 (never) to 5 (very often). The measurements included items such as “In the past month (while going through the COVID-19 situation), how many times were you embarrassed by something unexpected?” In the study by Lee et al. (2012), Cronbach's α coefficient, was 0.82; here, it was 0.76.

Coronavirus infection risk perception

We modified the COVID-19 risk perception tool developed by Choi et al. (2015) to measure risk perception regarding COVID-19 based on WHO (2020) and CDC (2020) COVID-19 guidelines. Content validity was verified by two infection control nurses, two respiratory internal medicine specialists, and one nursing professor (scale-level content validity index/average, S-CVI/Ave = 0.99). We conducted a pilot survey to review the items' readability and appropriateness. The risk perception tool comprised 3 questions based on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). For example, the items included “I am more likely to be infected with COVID-19 than others.” The higher each question's score, the higher the perceived risk of COVID-19. In Choi et al.'s (2015) study, Cronbach's α was 0.85; here, it was 0.76.

Family cohesion

To measure family cohesion, we used 10 family cohesion questions from the Family Adaptability, and Cohesion Evaluation Scale (FACES III) developed by Olson et al. (1985) and translated by Ahn (1988). Each question comprised a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items included “My family members ask each other for help.” The higher the score, the higher the family cohesion. In the study by Olson et al. (1985), Cronbach's α was 0.77, here, it was 0.84.

Positive psychological capital

We used the Positive Psychological Capital scale developed by Luthans et al. (2007) and modified by Lim (2014). This tool comprises the self-efficacy, optimism, hope, and resilience sub-domains and 5-point Likert scale responses ranging from 1 (not at all) to 5 (very much), with 18 items. This included items such as “I tend to recover quickly even after going through difficult times” and “It doesn't take long for me to recover after being stressed.” The higher the score, the higher the positive psychological capital. In Lim's study (2014), Cronbach's α was 0.93; here, it was 0.95.

Health promotion behavior

We modified the measuring tool for health promotion behaviors developed by Cho (2004) and revised by Ki (1985) for the current study focus. We revised the tool based on Choi et al (2015), CDC (2020), and WHO (2020) guidelines. The revised questions were verified for content validity (S-CVI/Ave = 0.96) by two pediatric nursing professors, two nursing professors, and one pediatrics specialist. In addition, we conducted a preliminary survey among 10 parents of young children to assess the questions' readability and appropriateness. The final tool comprised 29 items, each rated on a 4-point Likert scale ranging from 1 (not at all) to 4 (always). This tool included items such as “I have my child wear a mask when going to public places.” and “I encourage my child to engage in regular physical activity” and Here, higher scores

indicate a higher health promotion degree. Cho (2004) showed a Cronbach's α value of 0.86, while ours was 0.85.

Data analysis

The collected data were analyzed using SPSS Statistics 26.0 (IBM Corp., Armonk, NY). First, we categorized data into high and low groups, based on family cohesion scores, and performed analysis using the descriptive statistics method.

Second, we compared participants' general characteristics according to family cohesion using chi-square tests. Third, we used *t*-tests to analyze health behavior differences and related factors according to family cohesion. Fourth, we calculated Pearson's correlation coefficients to determine the correlations between health behavior and related factors according to family cohesion. Finally, we performed multiple regression analysis to determine which factors influence participant health behavior and how these influences differ according to family cohesion.

Results

The degree of family cohesion

We classified participants into a high (scores 38–50) and low (scores 10–37) family cohesion group. The average scores for 320 (74.1%) high group participants were 43.29 (± 3.40) and for 112 (25.9%) low group participants, it was 32.96 (± 3.60) (Table 1).

Differences in general characteristics according to family cohesion

We used the chi-square test to determine the differences between the high and low family cohesion groups according to participant demographic characteristics. Table 2 shows the participants' general characteristics according to differences in family cohesion.

We found significant differences in participant characteristics according to family cohesion in relation to monthly income ($\chi^2 [4 (2 \times 2)] = 18.66, p \leq 0.001$) and parent health status ($\chi^2 [4 (2 \times 2)] = 6.446, p = 0.040$). A monthly income of ≥ 4 million won was higher (72.19%) in the high group than in the low group (51.79%). The proportion of participants who answered that their health was good (very healthy, healthy) was higher in the high group (60.31%) than in the low group (47.32%).

Differences in health promotion behavior and its related factors according to family cohesion

Table 3 shows the differences in health promotion behavior and its related factors according to family cohesion. We found significant differences ($t = -7.16, p < 0.001$) in participant health-promoting behavior according to family cohesion, with higher scores among participants in the high group ($M = 104.70, SD = 7.06$) compared to of those in the low group ($M = 98.72, SD = 8.91$). Thus, participants in the high group had better health promotion behavior than participants in the low group.

We found significant differences ($t = -6.51, p < 0.001$) in participant positive psychological capital, with higher scores among participants in the high group ($M = 67.34, SD = 10.88$) than among those in the low group ($M = 60.26, SD = 9.56$) (Table 3).

Table 1
The Degree of family cohesion ($n = 432$).

Category	Frequency (%)	Mean (SD)
High family cohesion group (38–50)	320(74.1%)	43.29(3.40)
Low family cohesion group (10–37)	112(25.9%)	32.96(3.60)

Table 2
Differences between high and low family cohesion according to demographic characteristics of participants ($n = 432$).

Characteristics	Categories	Total ($n = 432$)	High family cohesion group ($n = 320$)	Low family cohesion group ($n = 112$)	χ^2 (p)
		n(%)	n(%)	n(%)	
Age(years)	≤34	120(27.78%)	87(27.19%)	33(29.46%)	5.589 (0.134)
	35–36	91(21.06%)	76(23.75%)	15(13.39%)	
	37–38	101(23.38%)	73(22.81%)	28(25.00%)	
	≥39	120(27.78%)	84(26.25%)	36(32.14%)	
Gender	Male	93(21.53%)	63(19.69%)	30(26.79%)	2.474 (0.115)
	Female	339(78.47%)	257(80.31%)	82(73.21%)	
Income(monthly)	≤199	8(1.85%)	3(0.94%)	5(4.46%)	18.660 (<0.001)
	200–299	51(11.81%)	31(9.69%)	20(17.86%)	
	300–399	84(19.44%)	55(17.19%)	29(25.89%)	
	≥400	289(66.90%)	231(72.19%)	58(51.79%)	
Parent health status	Very healthy	63(14.58%)	52(16.25%)	11(9.82%)	6.446 (0.040)
	Healthy	183(42.36%)	141(44.06%)	42(37.50%)	
	Not healthy	186(43.06%)	127(39.69%)	59(52.68%)	
Child gender	Male	240(55.56%)	178(55.63%)	62(55.36%)	0.002 (0.961)
	Female	192(44.44%)	142(44.38%)	50(44.64%)	
Child age (months)	<36	139(32.18%)	103(32.19%)	36(32.14%)	0.499 (0.780)
	36–59	149(34.49%)	113(35.31%)	36(32.14%)	
	≥60	144(33.33%)	104(32.5%)	40(35.71%)	
Child health status	Very healthy	160(37.04%)	124(38.75%)	36(32.14%)	1.761 (0.415)
	Healthy	202(46.76%)	147(45.94%)	55(49.11%)	
	Not healthy	70(16.20%)	49(15.31%)	21(18.75%)	

Relationships between participant health-promoting behavior and related factors according to family cohesion

Table 4 presents the relationships between health-promoting behavior and related factors according to family cohesion.

In the high family cohesion group, we observed a positive correlation between health-promoting behavior and positive psychological capital ($r = 0.24, p < 0.001$), and a negative relationship between positive psychological capital and risk ($r = -0.19, p < 0.001$) and stress ($r = -0.29, p < 0.001$).

Similarly, in the low family cohesion group, we observed positive correlations between health-promoting behavior and positive psychological capital ($r = 0.23, p = 0.017$) and stress ($r = 0.19, p = 0.049$), and a negative correlation between positive psychological capital and stress ($r = -0.25, p = 0.008$).

Factors influencing participant health promotion behavior according to family cohesion

To understand the factors influencing health promotion behavior across the two groups, we conducted multiple regression analysis using variables that showed a significant relationship with health-promoting behavior at a significance level $< 5\%$ through single variance analysis as independent variables. We tested for multicollinearity and independence of residuals in the regression model. We determined the independence of factors (none of the correlation coefficients between variables that influenced health-promoting behavior was above 0.80).

After verifying the error term's basic assumptions, the Durbin-Watson test statistic showed no autocorrelation with the low (2.01) and high (2.06) groups. The tolerance limit of multicollinearities was ≥ 0.1 , with tolerance values of 0.91–0.98 in the low group and 0.84–0.97 in the high group. The variance inflation factor (VIF) was also less than 10. The conditions for the error terms' normality and homoscedasticity were also satisfied.

In the high family cohesion group, the strongest influencing factors on the participants' health-promoting behavior were, in descending order of effect, family cohesion ($\beta = 0.26, p < 0.001$), positive psychological capital ($\beta = 0.23, p < 0.001$), gender ($\beta = 0.18, p = 0.001$), and stress ($\beta = 0.12, p = 0.024$). The model's explanatory power was 22.0% ($F = 13.84, p < 0.001$).

In the low family cohesion group, the strongest influencing factors were positive psychological capital ($\beta = 0.29, p = 0.002$), gender ($\beta = 0.24, p = 0.007$), stress ($\beta = 0.20, p = 0.025$), and parent health status ($\beta = -0.19, p = 0.028$). The model's explanatory power was 19.0% ($F = 7.59, p < 0.001$; Table 5).

Discussion

We identified the relative factors influencing parents' promotion of healthy behavior in young children during the current COVID-19 pandemic according to family cohesion.

This study revealed that more parents in the high family cohesion group rated their monthly income as “ ≥ 4 million won” compared to parents in the low group, consistent with Ham (2012), who reported an association between higher family economic status and higher family cohesion. Further, other previous studies (Han, 2010; Park & Kim, 2017) found differences in family cohesion according to family

Table 3
Differences in health promotion behavior and related factors according to family cohesion ($n = 432$).

Factors	High family cohesion group ($n = 320$)	Low family cohesion group ($n = 112$)	t	p
	M \pm SD	M \pm SD		
Health promotion behavior	104.70 \pm 7.06	98.72 \pm 8.91	-7.16	<0.001
Stress	20.82 \pm 5.58	21.61 \pm 4.54	1.35	0.179
Risk perception	7.83 \pm 2.11	7.68 \pm 1.98	-0.66	0.509
Positive psychological capital	67.34 \pm 10.88	60.26 \pm 9.56	-6.51	<0.001

Table 4
Relationships among health promotion behavior and related factors in high and low family cohesion groups ($n = 432$).

Category	Factors	Stress	Risk Perception	Positive psychological capital
		r (p)	r (p)	r (p)
High family cohesion group ($n = 320$)	Risk perception	0.43(<0.001)		
	Positive psychological capital	−0.29(<0.001)	−0.19(<0.001)	
	Health promotion behavior	0.07(0.238)	0.09(0.125)	0.24(<0.001)
Low family cohesion group ($n = 112$)	Risk perception	0.43(<0.001)		
	Positive psychological capital	−0.25(0.008)	−0.07(0.467)	
	Health promotion behavior	0.19(0.049)	0.13(0.181)	0.23(0.017)

Table 5
Factors influencing health promotion behavior by family cohesion group ($n = 432$).

Category		B	S.E	β	t	p
High family cohesion group ($n = 320$)	(Intercept)	59.42	5.38	0	11.04	<0.001
	Stress	0.15	0.07	0.12	2.27	0.024
	Family cohesion	0.53	0.11	0.26	5.01	<0.001
	Positive psychological capital	0.15	0.04	0.23	4.17	<0.001
	Gender†	3.21	0.90	0.18	3.55	0.001
$R^2 = 0.24$, Adj. $R^2 = 0.22$, $F = 13.84$, $p < .001$						
Low family cohesion group ($n = 112$)	(Intercept)	72.17	8.37	0	8.62	<0.001
	Stress	0.40	0.17	0.20	2.27	0.025
	Positive psychological capital	0.26	0.08	0.29	3.21	0.002
	Gender†	4.87	1.76	0.24	2.77	0.007
	Parent health status†	−2.59	1.16	−0.19	−2.23	0.028
$R^2 = 0.22$, Adj. $R^2 = 0.19$, $F = 7.59$, $p < 0.001$						

Dummy Variable reference group: Gender-Male = 1.

economic status or income level. We postulate that the greater financial difficulties experienced by families result in increased psychological pressure and instability among family members, resulting in difficulties forming emotional bonds or attachments.

Furthermore, the high family cohesion group had a higher proportion of healthy participants compared to the low group. These results show that there is strong correlation between health status and family cohesion (Ham, 2012; Park & Kim, 2017).

We found significant differences in participants' health-promoting behavior between the high and low family cohesion groups. Although there are no previous studies directly comparing health-promoting behavior according to family cohesion, our findings are comparable to those reported by Ham, 2012, concluding that the child–family attachment is highly correlated with promoting healthy behaviors in children. In sum, emotional attachment and cohesion within the family are important factors in promoting young children's health behavior (Bigman et al., 2015). To build on this, it is also important to identify the causes and mechanisms of low family cohesion, especially in this pandemic in the future. Thus, education and other specific strategies (such as online health care programs and applications to monitor daily health behavior) are needed to promote mutual parents–children attachment and increase family cohesion. Moreover, since cultural differences and family structure can affect family cohesion, a follow-up study is needed to determine what differences exist in health-promoting behaviors considering the causes of low family cohesion and structure.

Further, there was a significant difference in the positive psychological capital of participants according to family cohesion. This finding is consistent with previous studies reporting an association between positive psychological capital and parent–child attachment (Chang & Lee, 2017; Go, 2019; Lee & Noh, 2020). Previous studies found that family cohesion in two-parent families was higher than that in single-parent families and that single parents experience more psychological difficulties associated with the burden of child support and parenting alone

(Cho, Kim, & Kim, 2018). In addition, they experience difficulties in communication, sharing values, and fostering family cohesion (Chang & Lee, 2017). Therefore, we can infer that an individual's positive psychological capital allows the formation of bonds and attachments between family members (Hong & Yi, 2017; Luthans et al., 2007).

The significant differences in parents' health-promoting behaviors and positive psychological capitals according to family cohesion suggest that when family cohesion is at an appropriate level, the degree of belonging or attachment to the family can be balanced with individual autonomy, and effective family functions can be performed.

When examining the factors of parents' health-promoting behavior, positive psychological capital, the gender of parents, and stress due to the COVID-19 epidemic were identified as common influencers in the high and low family cohesion groups. These findings are supported by a previous report by Jeong (2009) that parenting efficacy, as a positive psychological capital, was an important factor explaining health-promoting behavior. Thus, parents' positive psychological capital can be used as an important resource for coping with stressful situations in the context of a persisting outbreak.

However, despite the high interest in positive psychological capital in the research field, there are limitations to finding actual educational or psychological counseling strategies to increase positive psychological capital (Kim, 2020). Therefore, it is important to systematically consider and manage the reinforcement of customized psychological competencies categorized by self-efficacy and resilience, especially in this pandemic.

Additionally, here, parental gender was a major factor influencing promotion of healthy behavior in their children, revealing that mothers had a positive effect on health promotion for children. Previous studies support (Kim, 2015; Kwon & Seo, 2013) this finding, stating that mothers present more health-related behaviors and information for their children's health management than fathers.

In recent years, despite women's social advancement in society and greater awareness of gender equality, as well as married men's increased awareness of the importance of contributing to housework and childrearing, in South Korea, where a paternalistic Confucian culture remains, child care is still considered a mother's sole responsibility (Choi et al., 2018). Our results support these previous findings, showing that mothers, the main caregivers, play a more important role in their children's health care than fathers and that fathers' participation in parenting remains low (Hong & Yi, 2017; Kim, 2015; Kwon & Seo, 2013).

Moreover, the crisis caused by the COVID-19 outbreak consolidates the role of mothers as primarily responsible for domestic housework and childcare. An increased burden on mothers, who must balance work and family in dual-income couples, may adversely affect their health-promoting behavior. Recent research consistently shows that fathers' active participation in parenting positively affects their children's growth and development, as is reflected in the widely used expression “fathers' effect” (Lee et al., 2016). Therefore, it is necessary to develop educational material and programs on child health—including hygiene management, eating habits, and indoor physical activities—for fathers, as good COVID-19 knowledge can generate optimism and appropriate disease response skills (Wie, 2013; Zhong et al., 2020).

A further influencing factor of health-promoting behavior was perceived stress caused by the COVID-19, consistent with Bae et al. (2015), who showed that the effect of stress varies depending on how the individual responds to stressful situations and that higher stress levels were associated with more positive health-promoting behavior. A further study by Joo (2011) also found a correlation between family stress and the health-promoting behavior among dual-income couples. We suggest that higher levels of perceived family stress are associated with a tendency to adopt health promotion practices successfully for the family's health and well-being. This appears to support a positive function of adequate levels of stress on the family's health behavior (Boss, 2002).

Accordingly, a high awareness of COVID-19-related stress can motivate parents to increase health-promoting behavior, regardless of family cohesion. However, since excessive stress can have a negative effect on health-promoting behavior, intervention is needed to relieve parents' and families' stress focusing on family functions.

However, family cohesion was an important influencing factor of health-promoting behavior only in the high family cohesion group. We can assume that in the low family cohesion group, family-related factors had low significance in influencing health-promoting behavior for children; thus, further research is needed to identify the difficulties such families are experiencing in this pandemic (such as those related to finances and parents' occupations) and why family-related factors have not affected their health promotion behavior. Furthermore, we propose that research is needed to identify the mediating or moderating factors involved in the low effect of family cohesion. In addition, it will be necessary to apply a family-centered program to instill family meaning in low cohesion families, especially to make family cohesion meaningful. Regional and national efforts are also needed to design family centered non-face-to-face online programs, for example, to promote physical activities and nutrition, and provide health information to all family members.

Additionally, since many studies have reported the risk of obesity in children due to external activity constraints and social interactions during this pandemic, it is necessary to form action plans involving both parents and children, wherein they exercise or cook healthy meals as a family, thereby promoting parents–children communication and interaction (Hamilton et al., 2020).

This study is meaningful in that it compared the health promotion behaviors of parents according to family cohesion, including both fathers and mothers—thereby, comprehensively identifying parental and family-related factors for improving the health of young children who are vulnerable to immunity in the current COVID-19 situation and providing basic data for preparing detailed counter measures for this purpose.

However, these findings should be interpreted with caution given the following limitations. First, as we used an online self-report questionnaire, the possibility of bias cannot be excluded. Further studies are needed to measure the outcome of parents' efforts to promote healthy behavior in their children.

Second, generalizability to other cultures may be limited as all participating parents were from South Korea. Third, this was a cross-sectional study that divided families into two groups (low and high family cohesion). A longitudinal study investigating long-term health behavior of parents toward their children in low family cohesion groups according to family dynamics and structure is required.

Finally, while we sought to illuminate the health behavior of parents, not all mother–father pairs were able to participate in the survey. Further, with an online survey, it was difficult to examine whether the parents of a 1:1 mother–father relationship in one household and the number of mothers and fathers were not evenly distributed owing to the limited sample size. Subsequent studies should, therefore, attempt to determine differences in parents' health behaviors between the mother and father in one household. Thorough in-depth interviews with parents and further research are required to determine the causes

for differences in health-promoting practices among parents and how parents perceive health-promoting behavior.

Practice implications

Our results suggest that family cohesion is a strong determinant of health promotion behavior of parents with young children in the COVID-19 pandemic, contributing to basic data for the development of a timely family centered health promotion program in pediatric field. Especially given the recent prevalence of COVID-19, providing an environment that can enhance parents' positive psychological capital could assist to further promote parents' optimal health behaviors. In addition, as mothers' continuous immersion in their children's health behavior can lead to feeling burdened and fatigued, pediatric nurses could also provide additional encouragement for fathers to assist in promoting their children's health behavior actively. Furthermore, in preparing programs to strengthen parents' promotion of healthy behavior, it is necessary to invigorate educational programs for both mothers and fathers that consider stress and factors of positive psychological capital.

Specifically, for the low family cohesion group, stress relief and moderation programs (i.e., programs targeting the individual factor) as well as family education programs and group counseling programs (targeting family-related factors) may be necessary to encourage health-promoting behavior by reinforcing family connection in COVID 19 pandemic.

Furthermore, considering that health behavior is a continuous process for children's long term growth and development, education for pediatric nurses is also needed to improve parents' attitudes and competence to guide their children's health attitudes in a positive direction.

Conclusion

The findings of this study confirmed that positive psychological capital and degree of health-promoting behavior varied according to family cohesion, and that the main factors influencing health-promoting behavior were also different. In addition, regardless of family cohesion, gender, stress, and positive psychological capital of parents had the greatest influence on promoting healthy behavior in children. That is, programs that consider improving both stress management and positive psychological capital directly applicable to the family should be developed to enhance health promotion behaviors during COVID-19.

These results provide a basis for mediation, suggesting the necessity to develop and apply an active intervention and management plan to improve the health-promoting behavior of parents of young children.

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Ethical approval

This study was approved by the Institutional Review Board (IRB No. 2–7,008,161-A-N-01). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Authorship contributions

Principal investigator: [Song I Park]; Study design: [Song I Park, In Young Cho]; Data collection and analysis: [In Young Cho; Song I Park]; Writing and reviewing of the manuscript: [In Young Cho; Song I Park]; Data analysis: [In Young Cho]; Writing and revising the manuscript: [In Young Cho].

Declarations of interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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