Vulnerability and resilience in children during the COVID-19 pandemic

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Declarations

Abbreviations: COVID-19: coronavirus disease 2019; CPCIS: Chinese Parent-Child Interaction Scale; PedsQL: Pediatric Quality of Life Inventory 4.0 Generic Core Scales; PSS: Perceived Stress Scale; SDQ: Strengths and Difficulties.

Abstract (240 words)

Background: The coronavirus disease 2019 (COVID-19) pandemic is having a profound impact on the health and development of children worldwide. There is limited evidence on the impact of COVID-19 and its related school closures and disease-containment measures on the psychosocial wellbeing of children; little research has been done on the characteristics of vulnerable groups and factors that promote resilience.

Methods: We conducted a large-scale cross-sectional population study of Hong Kong families with children aged 2 to 12 years. Parents completed an online survey on family demographics, child psychosocial wellbeing, functioning and lifestyle habits, parent-child interactions, and parental stress during school closures due to COVID-19. We used simple and multiple linear regression analyses to explore factors associated with child psychosocial problems and parental stress during the pandemic.

Results: The study included 29,202 individual families; of which 12,163 had children aged 2 to 5 years and 17,029 had children aged 6 to 12 years. The risk of child psychosocial problems was higher in children with special educational needs, and/or acute or chronic disease, mothers with mental illness, single-parent families, and low-income families. Delayed bedtime and/or inadequate sleep or exercise duration, extended use of electronic devices were associated with significantly higher parental stress and more psychosocial problems among preschoolers.

Conclusions: This study identifies vulnerable groups of children and highlights the importance of strengthening family coherence, adequate sleep and exercise, and responsible use of electronic devices in promoting psychosocial wellbeing during the COVID-19 pandemic.

Keywords

Home confinement, Child psychosocial problems, School closure, COVID-19, Coronavirus

Introduction

Since December 2019, the coronavirus disease 2019 (COVID-19) has had devastating effects on health and economies worldwide. By March 2020, around a third of the world's population was under lockdown in an attempt to fight this pandemic [1]. As one of the key strategies adopted to prevent the spread of COVID-19, all schools in Hong Kong were ordered to close at the end of January 2020 by the Government of the Hong Kong Special Administrative Region (HKSAR) [2].

Nevertheless, prolonged school closures, disease-containment measures and economic shutdowns during the COVID-19 pandemic can have potentially serious implications on all aspects of a child's development, including physical, psychosocial, cognitive, and mental health, and on family relationships. Incidence of domestic violence and child maltreatment may increase during periods of school closure[3]. Children could be at greater risk in homes with overcrowding or with parents unemployed due to COVID-19 [4]. Concerns have been raised over the adequacy of support for vulnerable groups such as children with learning difficulties, neurodevelopmental disorders, and mental health needs [4]. In addition, homeschooling can be difficult for children from low-income families due to limited resources. A recent survey conducted in the UK showed that parents were experiencing increased stress during the coronavirus outbreak, as they were trying to balance caring responsibilities, home schooling, and working from home [5]. The economic impact of the pandemic is also likely to add financial burdens and increase parental stress [6]. For children and adolescents with mental health needs, school closures might be even more devastating due to the lack of resources and help at home that the schools would normally provide. In a study by the UK mental health charity, YoungMinds, on 2,111 young people up to the age of 25 years with a history of mental illness, they found 83% of those surveyed reported the pandemic had made their conditions

worse [7]. A recent review on the psychological impact of quarantine during COVID-19 showed a high prevalence of post-traumatic stress and fear among subjects in quarantine [8]. Children are more vulnerable to their environment, which can affect their long-term health and productivity in adult life [9]. Despite limited studies addressing the impact of COVID-19 pandemic on the psychosocial well-being of children, existing data from previous studies highlighted definite concerns over the physical and mental health of children during health-related disasters[10-14]. We hypothesize that the current COVID-19 pandemic and related disease-containment measures such as school closures and isolation would pose detrimental effects on the psychosocial well-being of children as well as their parents.

It is essential to elucidate the risks and protective mechanisms underlying the interaction between parents and children who are at home due to school closures. We further hypothesized that health and social inequalities might deepen during the pandemic; children and families with mental health or chronic diseases with lower socioeconomic status would have higher susceptibility to stress. Therefore, they would be prone to the detrimental psychological effects as a result of the COVID-19 pandemic. On the other hand, fundamental principles to promote healthy living in children and parent-child interactions became even more crucial during the challenging times of the COVID-19 pandemic.

Hong Kong was one of the first cities to mandate school closures during the coronavirus outbreak, and so far, some children have been home-schooled for nearly 9 months. Prior to the pandemic, schools were also closed a number of times due to the social unrest in Hong Kong [15]. Consequently, children in Hong Kong have not had regular schooling for more than 9 consecutive months. As COVID-19 has continued to spread globally, school closures have become necessary in many places around the world including in the United States and many

countries in Europe [16]. This is the first large-scale population study to investigate and identify the characteristics of children vulnerable to the negative impacts of the COVID-19 pandemic. The study also aimed to ascertain factors that can promote psychosocial wellbeing within families during the COVID-19 pandemic. This will help us build a knowledge base to inform the development of effective strategies to mitigate adverse outcomes due to COVID-19.

Method

Study Design and Participants

This was a large-scale population-based study using an online questionnaire to assess the impact of prolonged school closure on children and their parents during the COVID-19 pandemic. The questionnaire was developed using Qualtrics, an online survey software program. This study was approved by the ethics committee of the Institutional Review Board of the Hong Kong University/Hospital Authority Hong Kong West Cluster (Reference UW 20-177).

The online questionnaire was first distributed to principals and parent groups of kindergartens and primary schools in the five main districts in Hong Kong (Hong Kong Island, Kowloon East, Kowloon West, New Territories East, and New Territories West). Parents of children aged 2 to 12 years were then invited by the schools to join this study. In Hong Kong, pre-schoolers start nursery at 2 years old and all children attend kindergartens at 3 years old. School-aged children start primary schools at the age of 6 years and most finish primary schools by 12 years old. All participating parents were asked to give their informed consent and provide details on the name of their child and their respective school. Potential duplicate entries were removed and each family was only allowed to enter information for one child (their eldest child

in the case of multiple children at one school). Children outside the target age range or those not yet starting school were excluded from the analyses.

Survey Development

The questionnaire was developed by the research team with input from a multidisciplinary team of advisers including paediatricians, educational, social sciences, and public health experts. The survey items were reviewed by all the experts for quality assurance. The online questionnaire was first piloted by a group of parents, and health and educational professionals, and modified according to their suggestions. The final survey contained sections designed to assess demographic background, health and wellbeing of children and parents, and changes in lifestyle habits of children at home since the school closures. The survey took approximately 15-20 minutes to complete and parents were required to answer all questions. Items included a mix of close-ended questions and items scored on a Likert scale.

The questionnaire was available in both Chinese and English versions, and included 21 questions on the demographics of children (gender, date of birth, number of siblings, and history of disease), parents (age, education level, history of disease, occupation, and marital status), and family (monthly household income, household size, apartment size, and status if receiving Comprehensive Social Security Assistance, which is provided by the government to support the unemployed and those in need). Lifestyle questions estimating children's duration of sleep and physical exercise on weekdays and weekends were also included. To estimate the change in the amount of time children spent with technology during COVID-19, parents were asked "What is the average amount of time your child spends on television, game console, and other handheld electronic devices for learning or doing homework or playing games on weekdays and weekends before and after school closure?" In addition, we used locally

validated scales to examine functioning and behaviour of children and parents during the school closure. The eight-item Chinese Parent-Child Interaction Scale (CPCIS) was used to measure the frequency of learning- and recreational-based parent-child interactions [17]. The 25-item Strength and Difficulties Questionnaire (SDQ) was used to measure five problem behaviours (emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems) and one positive behaviour (prosocial behaviour) [18]. The 18-item Pediatric Quality of Life Inventory 4.0 Generic Core Scales (PedsQL) was used to measure child functioning [19]. The 17-item Parental Stress Scale (PSS) was used to measure parental stress [20]. All measurement scales have been previously validated and are widely for research purposes in Hong Kong. Details of the scale items and scoring methods can be found in Supplementary File 1. Parents completed the questionnaires in late March 2020.

Data analysis

All analyses were performed using R Statistical Software version 3.6.3. All variables were examined for their distribution, outliers, and missing data before analysis. The assumption of a normal distribution was analysed by skewness and kurtosis. Potential outliers were removed if values were ≥ 3 standard deviations from the group mean. Descriptive statistics were used to examine the characteristics of the respondents and the measured variables. An independent two-sample t-test was used to compare the study sample means with those from other local samples (see Supplementary File 2). Pearson correlation was used to evaluate the interrelationship between SDQ and PSS and other measured variables. Linear regression models with SDQ/PSS score as the dependent variable and demographic or lifestyle factors as the independent variables were built to identify factors associated with SDQ and PSS scores during school closure. Effect sizes were computed in various forms depending on the test used according to the guidelines by Cohen [21], Missing data for the outcome measures and

covariates (<10% for each imputed variable) were handled using multiple imputation via chained equations (MICE) using the 'mice' package in R [22]. All tests were two-tailed and conducted both with and without using Bonferroni adjusted alpha levels [23].

Results

The questionnaire was completed by 35,303 individual families across socioeconomic positions from all 18 districts of Hong Kong. Duplicate entries (2%), ineligible respondents who were outside age the range (10%), and incomplete responses (5%) were excluded, giving a total of 29,202 (82.7%) completed questionnaires included in the final analyses. The final sample comprised 12,163 parents with preschoolers aged 2-5 years and 17,029 parents with school-aged children aged 6-12 years. As shown in Table 1, the mean age of children was 6.50 years and 51.43% were males. Over 60% of fathers and mothers were aged between 35 and 44 years. The average total household income was USD 6245 per month. Regarding the health profile of children, 12.82% had special educational needs (SENs), 3.68% had a chronic disease, and 4.12% had acute health problems in the past 4 weeks. Regarding the health profile of parents, 1.65% of fathers had mental disorders and 4.14% had chronic diseases, whereas 4.03% of mothers had mental disorders and 6.97% had chronic diseases. After school closure, children on average slept for 10.76 hours, exercised for around 1 hour, and used electronic devices for 2.31 hours per day. The amount of time spent on electronic devices for gaming and recreational purposes increased on average by about 1 hour after school closures, and the 6 to 12 year age group showed the largest increases.

Table 2 shows a comparison of the SDQ, PedsQL, and PSS scale scores between our study sample and other Hong Kong study samples (see Supplementary File 2). Compared to the reference means, children in our study demonstrated significantly more psychosocial problems

measured by the SDQ total difficulties score, fewer prosocial behaviours measured by the SDQ prosocial behaviour score, and poorer functioning measured by PedsQL total score. Compared to the reference group, their parents exhibited higher levels of parenting stress measured by the PSS scale.

Tables 3a and 3b show the adjusted regression models between SDQ or PSS scores and other modifiable factors in the overall sample and in both age groups. The correlations are shown in Supplementary Table 1 and 2. The positive associations between SDQ and PSS scores remained significant after adjusting for age and gender of children and family socioeconomic status. Delay in going to bed and the amount of time spent on electronic devices for gaming were significantly and positively associated with SDQ and PSS scores in the overall sample and in both age groups, suggesting an increase in behavioural problems and parental stress. After school closure, the increase in the time spent on electronic devices for learning was significantly associated with higher SDQ total difficulties score in the 2 to 5 year age group (β = 0.05, p<0·001), but not in the 6 to 12 year age group. The CPCIS learning and recreational activities and daily exercise duration were significantly and negatively associated with SDQ problem behaviour scores in the overall sample and in both age groups. These association patterns were also found in PSS scores for all study groups.

The mutually adjusted models in Table 4a showed the SDQ scores were higher in those with SENs and those with health problems. Parents with mental disorders or parents who were divorced/separated were also associated with higher scores in most of the SDQ problem behaviour scales, whereas older age, more siblings, and higher family socioeconomic status appeared to be protective factors. Table 4b show higher PSS scores were associated with mothers with mental disorder and parents who had divorced/separated, as well as SENs and

acute health problems in both age groups. The crude results are shown in Supplementary Table 3 and 4.

Discussion

Despite concerns about social and health inequalities during the COVID-19 pandemic [24-27], there has been little research on the characteristics of vulnerable groups. Our study provides the first empirical evidence of school closure exacerbating existing inequalities in families with children with SENs, particularly in families with members who have mental disorders or single-parent families. Furthermore, this study suggested that even healthy children might be at risk of psychosocial problems with decreased emotional, social functioning and lower physical activity level during a disease pandemic with prolonged periods of schools closure.

UNESCO estimates that 138 countries have closed schools nationwide due to the pandemic, affecting the education of 80% of children worldwide [28], which emphasizes our important findings on a global scale. Compared to older children, preschool children appeared to be more affected during the pandemic, as they exhibited more conduct problems and symptoms of hyperactivity/inattention. The first 5 years of life represent a critical period in children's brain development. During these early years, the brain undergoes rapid synaptogenesis and synaptic plasticity [29], and thus young brains are considerably more sensitive to environmental factors particularly the negative effects of the pandemic and its related school closure. Furthermore, UNESCO estimates that over 300 million children worldwide are missing free meals provided by schools [28].

Our study showed that parents of children with SENs were more likely to experience elevated stress during prolonged school closure due to the COVID-19, which may lead to an interruption

in their rehabilitation training. Furthermore, these parents would need to supervise their children closely and might not be able to work from home properly. Likewise, parents of children with acute or chronic illnesses or those with mental disorders (particularly mothers) were more likely to experience increased stress during the COVID-19 pandemic. Notably, physical and mental health conditions in children and parents had a greater impact on parental stress than socioeconomic status. Parental stress was significantly higher in single-parent families, whereas families with parents living together experienced less stress regardless of their socioeconomic status. These findings suggest that shared caregiving responsibility among family members may play a significant role in protecting the family against stress during a pandemic.

It has been reported that elevated parental stress is a risk factor for child abuse and domestic violence [30,31]. Hence, it is of utmost importance to identify modifiable protective factors to promote psychosocial wellbeing in children and their families during difficult times. Furthermore, nurturing resilience during a disease pandemic is important as it helps to reduce worries, anxiety and depression [32]. Existing studies emphasize the importance of family processes in buffering against the risk of social disruptions during COVID-19 [33], as well as promoting resilience through shared family beliefs and close relationships among parents and siblings[34]. In addition, our study found that parent-child interactions were beneficial in terms of reducing children's psychosocial problems and parental stress during the pandemic with prolonged school closure, which remained significant even after controlling for family socioeconomic status.

During the COVID-19 pandemic, we also observed that children who went to bed earlier and those with longer sleep duration had fewer psychosocial problems. Previous studies have

highlighted the importance of adequate sleep on behavioural development [35] and quality of life in children [36]. Similar findings have also been observed for children who maintained an exercise routine during school closure. Children who were more active exhibited fewer psychosocial problems, and subsequently resulted in less parental stress. On the other hand, although distance learning through digital technologies has become pivotal during school closures, our results revealed that prolonged and increased use of electronic devices for both gaming and learning purposes was associated with increased psychosocial problems especially in younger children and resulted in more parental stress. Therefore, prolonged use of electronic devices should be avoided. Parents and educators of pre-schoolers should adhere to the American Academy of Pediatrics (AAP) recommendations to limit screen time to less than 1 hour per day [37] and consider home-schooling without relying solely on digital technologies.

Our study should be interpreted with the following caveats. As data were collected via an electronic survey without direct assessment, parental reporting might be subject to recall and/or reporting bias. However, because the study was carried out during territory-wide school closures and with social distancing due to the disease outbreak, an electronic survey method was considered to be the safest and most effective way to collect data from a large number of subjects within a short period. For questions related to the lifestyle changes in children, parents were required to input the duration of sleep, exercise and use of electronic device before and after the COVID-19-related school closures. Hence, there might be recall bias especially for the duration prior to the school closures. This cross-sectional study can be used to report associations but cannot be used to ascertain causative relationships. The study required access to an electronic device to complete the online survey, and parents from low-income families might not have access to such devices or an internet connection and would not have been able to join the study. Although the recruited parents were generally well educated, we also recruited

subjects with disadvantaged socioeconomic backgrounds from across the whole territory, including 2% of families receiving social security, which is similar to the number of people receiving social security (2.9%) in the general population of Hong Kong [38]. Furthermore, our large study sample represents 4.7% of the child population aged 2 to 12 years in Hong Kong [39].

In conclusion, our study suggests additional support should be targeted at children in vulnerable groups to reduce the consequences of deepening social, economic, and health inequalities, especially in families with mental and/or physical illness and single-parents families [24]. Measures such as online visitation and consultation, and extra funding support for home learning in underprivileged families should also be considered. Our findings highlight the importance of strengthening family coherence, adequate sleep and exercise, and responsible use of electronic devices to promote family wellbeing during the COVID-19 pandemic [6]. It is important to prioritize resources to those in need and establish strategies to strengthen family care to support our children in this difficult time [3,40].

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Table 1. Subject characteristics

	Overall (n=29202)	Age 2-5 (n=12163)	Age 6-12 (n=17029)
	n(%) / mean(SD)	n(%) / mean(SD)	n(%) / mean(SD)
Child			
Age	6.50(2.84)	3.71(1.04)	8.51(1.86)
Gender			
Male	14970(51.4)	6258(51.6)	8707(51.3)
Female	14140(48.6)	5880(48.4)	8255(48.7)
Having special educational needs	3742(12.8)	971(8.0)	2770(16.3)
Having chronic disease	1073(3.7)	304(2.5)	769(4.5)
Having acute health problems in the past 4 weeks	1204(4.1)	615(5.1)	589(3.5)
Living with someone having direct contact with confirmed COVID-19 cases	77(0.3)	28(0.2)	49(0.3)
Living with healthcare workers	2336(8.0)	1113(9.2)	1222(7.2)
Daily sleep duration (hour)	10.76(1.08)	10.83(0.93)	10.87 (0.88)
Daily physical activity duration (hour)	1.01(0.87)	1.06(0.90)	0.98(0.84)
Parental restriction on electronic device use	27867(95.4)	11645(95.7)	16214(95.2)
Before school closure			
Weekday time spent on electronic devices for learning (hour)	0.84(0.91)	0.60(0.80)	1.01(0.94)
Weekday time spent on electronic devices for gaming (hour)	0.48(0.78)	0.31(0.66)	0.60(0.84)
Weekday time spent on electronic devices (hour)	1.32(1.43)	0.90(1.24)	1.62(1.48)
After school closure			
Weekday time spent on electronic devices for learning (hour)	1.46(1.07)	0.99(0.95)	1.80(1.01)
Weekday time spent on electronic devices for gaming (hour)	0.84(1.07)	0.48(0.87)	1.10(1.12)
Weekday time spent on electronic devices (hour)	2.31(1.76)	1.47(1.50)	2.90(1.70)
Change before and after school closure			
Weekday time spent on electronic devices for learning (hour)	0.62(1.08)	0.39(0.80)	0.79(1.21)
Weekday time spent on electronic devices for gaming (hour)	0.36(0.76)	0.18(0.56)	0.50(0.85)
Weekday time spent on electronic devices (hour)	0.99(1.54)	0.57(1.12)	1.29(1.72)
Father			
Age			
18 - 24	39(0.1)	30(0.3)	8(0.1)
25 - 34	3571(12.2)	2619(21.5)	951(5.6)
35 - 44	18185(62.3)	8096(66.6)	10084(59.2)

45 - 54	6693(22.9)	1287(10.6)	5404(31.7)
55 - 64	647(2.2)	112(0.9)	534(3.1)
65 or above	67(0.2)	19(0.2)	48(0.3)
Education level			
None/ Kindergarten	35(0.1)	13(0.1)	22(0.1)
Primary	269(0.9)	71(0.6)	198(1.2)
Lower secondary	4058(13.9)	1307(10.8)	2748(16.1)
Upper secondary	7784(26.7)	2922(24.0)	4861(28.6)
Diploma/Higher Diploma/Tertiary	4827(16.5)	2220(18.3)	2604(15.3)
Bachelor or above	12229(41.9)	5630(46.3)	6596(38.7)
Employment status			
Employed	27444(94.0)	11557(95.0)	15879(93.3)
Unemployed/retired/ homemaker	1758(6.0)	606(5.0)	1150(6.8)
Having mental diseases	481(1.7)	166(1.4)	315(1.9)
Having chronic diseases	1208(4.1)	383(3.2)	824(4.8)

Mother

Age			
18 - 24	127(0.4)	96(0.8)	30(0.2)
25 - 34	6333(21.7)	4307(35.4)	2024(11.9)
35 - 44	19460(66.6)	7441(61.2)	12015(70.6)
45 - 54	3183(10.9)	278(2.3)	2902(17.0)
55 - 64	44(0.2)	17(0.1)	27(0.2)
65 or above	9(0.03)	0(0.00)	9(0.05)
Missing	46(0.2)	24(0.2)	22(0.1)
Education level			
None/ Kindergarten	19(0.07)	5(0.04)	14(0.08)
Primary	232(0.8)	56(0.5)	175(1.0)
Lower secondary	2980(10.2)	961(7.9)	2018(11.9)
Upper secondary	8269(28.3)	2883(23.7)	5384(31.6)
Diploma/Higher Diploma/Tertiary	5947(20.4)	2670(22.0)	3275(19.2)
Bachelor or above	11755(40.3)	5588(45.9)	6163(36.2)
Employment status			
Employed	16986(58.2)	7435(61.1)	9544(56.1)
Unemployed/retired/ homemaker	12216(41.8)	4728(38.9)	7485(44.0)
Having mental diseases	1176(4.0)	453(3.7)	723(4.3)
Having chronic diseases	2036(7.0)	575(4.7)	1460(8.6)

Family

Parents' marital status			
Married/ cohabitating	27594(94.5)	11744(96.6)	15841(93.0)
Divorced/ separated	1608(5.5)	419(3.4)	1188(7.0)
Average monthly household income (USD)	6245.05 (4372.47)	6469.04 (4304.94)	6085.06 (4413.42)
Average monthly household income adjusted for household size (USD)	3019.13 (2108.79)	3147.46 (2108.19)	2927.41 (2104.52)
Receiving Comprehensive Social Security Assistance (CSSA)	555(1.9)	151(1.2)	404(2.4)

Number of siblings	0.76 (0.72)	0.60 (0.66)	0.88(0.74)
Number of people living with the child	3.43(1.17)	3.43(1.21)	3.43(1.15)
Apartment size (sq ft)	535.40(254.50)	516.41(242.49)	549.04(261.90)
Average floor space per person (sq ft)	125.85(58.98)	121.89(55.57)	128.70(61.15)

Table 2. Comparison of SDQ, PedsQL, and PSS between the present study sample and other Hong Kong samples

	Comparison Hong Kong sample	Overall (n=29202)			Age 2-5 (n=12163)	Age 6-12 (n=17029)
	Mean(SD)	Mean(SD)	Cohen's d	p-value	Mean(SD)	Mean(SD)
SDQ[a]						
Emotional symptoms	2.5(2.0)	2.09(1.77)	0.21	***	2.22(1.71)	1.99(1.80)
Conduct problems	2.1(1.6)	2.27(1.58)	-0.11	***	2.39(1.51)	2.18(1.62)
Hyperactivity/inattention	4.5(2.3)	4.84(2.22)	-0.15	***	5.06(2.12)	4.68(2.27)
Peer relationship problems	2.6(1.7)	2.89(1.74)	-0.17	***	3.12(1.72)	2.73(1.75)
Prosocial behaviour	6.7(2.0)	6.36(1.99)	0.17	***	6.19(1.97)	6.49(2.00)
Total difficulties	11.7(5.4)	12.09(5.42)	-0.07	***	12.79(5.13)	11.59(5.57)
PedsQL[b]						
Physical functioning	87.74(12.48)	81.78(14.04)	0.45	***	81.33(14.28)	82.11(13.85)
Emotional functioning	78.57(15.78)	76.79(16.70)	0.11	***	76.97(16.61)	76.67(16.76)
Social functioning	82.12(16.47)	78.45(16.41)	0.22	***	78.85(16.16)	78.16(16.58)
Psychosocial functioning	79.71(13.04)	78.48(14.93)	0.09	**	78.91(14.64)	78.17(15.12)
Total score	82.77(11.58)	79.74(13.40)	0.24	***	79.83(13.38)	79.67(13.41)
PSS parental stress[b]	46.74(10.35)	49.38(10.48)	-0.25	***	48.88(10.10)	49.72(10.72)

Note: ***p<0.001, **p<0.01; d = 0.2 as small, d = 0.5 as medium and d = 0.8 as large according to the guidelines by Cohen.

[a] Based on a stratified sample of 3,722 students aged between 6 and 12 years from schools with different achievement brandings and different socio-economic regions of Hong Kong (Please refer to Supplementary File 2 for more details on the sample characteristics)

[b] Based on a study of 1280 disadvantaged families (parent mean age: 35.63 years; child mean age: 3.10 years) recruited from 32 kindergartens in two underprivileged districts of Hong Kong (Please refer to Supplementary File 2 for more details on the sample characteristics).

Table 3a. Regression models between SDQ scores and other study variables

	Total Difficulties		Emotional symptoms		Conduct problems		Hyperactivity/ Inattention		Peer relationship problems		Prosocial behaviour	
	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value
Overall												
PSS parental stress	0.26 (0.50)	***	0.06 (0.34)	***	0.06 (0.41)	***	0.09 (0.43)	***	0.05 (0.30)	***	-0.07 (-0.36)	***
CPCIS Learning Activities	-0.74 (-0.11)	***	-0.12 (-0.05)	***	-0.19 (-0.09)	***	-0.19 (-0.07)	***	-0.24 (-0.11)	***	0.39 (0.15)	***
CPCIS Recreational Activities	-1.50 (-0.19)	***	-0.22 (-0.09)	***	-0.32 (-0.14)	***	-0.60 (-0.19)	***	-0.36 (-0.14)	***	0.67 (0.23)	***
Daily sleep duration	-0.30 (-0.06)		-0.05 (-0.03)		-0.07 (-0.05)		-0.10 (-0.04)	***	-0.08 (-0.05)		0.11 (0.06)	***
Delay in going to bed (weekday)	0.53 (0.11)	***	0.12 (0.08)	***	0.13 (0.09)	***	0.19 (0.10)	***	0.09 (0.06)	***	-0.12 (-0.07)	***
Delay in going to bed (weekend)	0.43 (0.10)	***	0.10 (0.06)	***	0.10 (0.08)	***	0.15 (0.08)	***	0.09 (0.06)	***	-0.09 (-0.05)	***
Daily exercise duration	-0.55 (-0.09)	***	-0.10 (-0.05)	***	-0.08 (-0.04)	***	-0.29 (-0.11)	***	-0.07 (-0.04)	***	0.26 (0.11)	***
Parental restriction on electronic device use	0.05 (0.01)		0.01 (0.01)		0.06 (0.04)		0.20 (0.09)	***	-0.22 (-0.13)	***	0.18 (0.09)	***
Weekday time spent on electronic devices for gaming after school closure (hour)	0.49 (0.10)	***	0.10 (0.06)	***	0.12 (0.08)	***	0.19 (0.09)	***	0.09 (0.05)	***	-0.07 (-0.04)	***
Weekday time spent on electronic devices for learning after school closure (hour)	0.21 (0.04)	***	0.05 (0.03)	***	0.03 (0.02)	***	0.09 (0.04)	***	0.03 (0.02)	**	0.03 (0.02)	**

25

	(1)	(2)	(3)	(4)	(5)	(6)
Increase in weekday time spent on electronic devices for gaming after school closure (hour)	0.25 (0.03) ***	0.02 (0.01)	0.05 (0.03) ***	0.18 (0.06) ***	-0.01 (-0.004)	-0.04 (-0.02) **
Increase in weekday time spent on electronic devices for learning after school closure (hour)	0.05 (0.01)	-0.001 (-0.001)	-0.005 (-0.003)	0.09 (0.04) ***	-0.04 (-0.02) ***	0.003 (0.002)

Age 2-5

	(1)	(2)	(3)	(4)	(5)	(6)
PSS parental stress	0.25 (0.49) ***	0.06 (0.35) ***	0.06 (0.39) ***	0.08 (0.40) ***	0.05 (0.30) ***	-0.07 (-0.35) ***
CPCIS Learning Activities	-1.24 (-0.18) ***	-0.19 (-0.09) ***	-0.30 (-0.15) ***	-0.43 (-0.15) ***	-0.32 (-0.14) ***	0.49 (0.19) ***
CPCIS Recreational Activities	-1.88 (-0.24) ***	-0.27 (-0.11) ***	-0.43 (-0.19) ***	-0.72 (-0.23) ***	-0.45 (-0.18) ***	0.73 (0.25) ***
Daily sleep duration	-0.43 (-0.08) ***	-0.07 (-0.04)	-0.10 (-0.06) *	-0.17 (-0.07) **	-0.10 (-0.06) *	0.13 (0.06) ***
Delay in going to bed (weekday)	0.50 (0.11) ***	0.11 (0.07) ***	0.12 (0.09) ***	0.17 (0.09) ***	0.10 (0.07) ***	-0.08 (-0.05) ***
Delay in going to bed (weekend)	0.37 (0.08) ***	0.08 (0.05) ***	0.08 (0.06) ***	0.12 (0.07) ***	0.08 (0.06) ***	-0.06 (-0.04) ***
Daily exercise duration	-0.50 (-0.08) ***	-0.08 (-0.04) ***	-0.07 (-0.04) ***	-0.27 (-0.11) ***	-0.08 (-0.04) ***	0.24 (0.10) ***
Parental restriction on child electronic device use	-0.23 (-0.04)	0.03 (0.02)	-0.07 (-0.04)	-0.02 (-0.01)	-0.17 (-0.10) *	0.38 (0.19) ***
Weekday time spent on electronic devices	0.57 (0.11) ***	0.13 (0.08) ***	0.15 (0.10) ***	0.20 (0.10) ***	0.10 (0.06) ***	-0.07 (-0.04) ***

for gaming after school closure (hour)											
Weekday time spent on electronic devices for learning after school closure (hour)	0.36 (0.07)	***	0.09 (0.05)	***	0.08 (0.05)	***	0.12 (0.06)	***	0.06 (0.04)	***	0.02 (0.01)
Increase in weekday time spent on electronic devices for gaming after school closure (hour)	0.48 (0.07)	***	0.06 (0.03)	*	0.12 (0.06)	***	0.30 (0.10)	***	0.01 (0.004)		-0.06 (-0.02)
Increase in weekday time spent on electronic devices for learning after school closure (hour)	0.25 (0.05)	***	0.03 (0.02)		0.04 (0.03)	*	0.18 (0.09)	***	0.004 (0.003)		-0.02 (-0.01)

Age 6-12

PSS parental stress	0.26 (0.51)	***	0.06 (0.33)	***	0.06 (0.42)	***	0.09 (0.44)	***	0.05 (0.30)	***	-0.07 (-0.38)	***
CPCIS Learning Activities	-0.53 (-0.08)	***	-0.10 (-0.04)	***	-0.15 (-0.07)	***	-0.14 (-0.05)	***	-0.14 (-0.06)	***	0.31 (0.12)	***
CPCIS Recreational Activities	-1.29 (-0.16)	***	-0.19 (-0.07)	***	-0.26 (-0.12)	***	-0.54 (-0.17)	***	-0.30 (-0.11)	***	0.63 (0.22)	***
Daily sleep duration	-0.21 (-0.04)		-0.04 (-0.03)		-0.05 (-0.04)		-0.07 (-0.03)	*	-0.04 (-0.03)		0.08 (0.04)	**
Delay in going to bed (weekday)	0.57 (0.12)	***	0.13 (0.09)	***	0.14 (0.10)	***	0.23 (0.12)	***	0.07 (0.05)	***	-0.13 (-0.08)	***
Delay in going to bed (weekend)	0.49 (0.11)	***	0.11 (0.08)	***	0.12 (0.09)	***	0.18 (0.10)	***	0.08 (0.05)	***	-0.11 (-0.07)	***
Daily exercise duration	-0.58 (-0.09)	***	-0.12 (-0.06)	***	-0.09 (-0.05)	***	-0.29 (-0.12)	***	-0.08 (-0.04)	***	0.29 (0.13)	***

	B (β)		B (β)		B (β)		B (β)		B (β)		B (β)	
Parental restriction on electronic device use	0.21 (0.04)		-0.01 (-0.006)		0.12 (0.08)	*	0.29 (0.13)	***	-0.20 (-0.11)	***	0.02 (0.01)	
Weekday time spent on electronic devices for gaming after school closure (hour)	0.45 (0.09)	***	0.09 (0.05)	***	0.11 (0.07)	***	0.18 (0.09)	***	0.08 (0.05)	***	-0.07 (-0.04)	***
Weekday time spent on electronic devices for learning after school closure (hour)	0.11 (0.02)	**	0.03 (0.02)		0.01 (0.004)		0.05 (0.03)	**	0.02 (0.01)		0.04 (0.02)	**
Increase in weekday time spent on electronic devices for gaming after school closure (hour)	0.17 (0.02)	***	0.01 (0.004)		0.03 (0.02)	*	0.14 (0.05)	***	-0.01 (-0.01)		-0.04 (0.01)	*
Increase in weekday time spent on electronic devices for learning after school closure (hour)	-0.02 (-0.004)		-0.01 (-0.009)		-0.02 (-0.01)		0.05 (0.03)	**	-0.04 (-0.02)	***	0.002 (0.001)	

Note: ***p<0.001; **p<0.01; *p<0.05; B denotes unstandardized coefficients and *β* denotes standardized coefficients; β = 0.1 as small, β = 0.3 as medium and β = 0.5 as large according to the guidelines by Cohen.

[a] Adjusted for child's gender and age and family socioeconomic status

Table 3b. Regression models between PSS and other study variables

	Overall		Age 2-5		Age 6-12	
	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value
CPCIS Learning Activities	-1.21 (-0.09)	***	-2.00 (-0.15)	***	-1.10 (-0.08)	***
CPCIS Recreational Activities	-3.15 (-0.21)	***	-3.37 (-0.22)	***	-3.09 (-0.20)	***
Daily sleep duration	-0.42 (-0.04)	*	-0.60 (-0.06)	***	-0.34 (-0.03)	
Delay in going to bed (weekday)	0.63 (0.07)	***	0.61 (0.07)	***	0.70 (0.08)	***
Delay in going to bed (weekend)	0.49 (0.06)	***	0.36 (0.04)	***	0.63 (0.07)	***
Daily exercise duration	-1.27 (-0.11)	***	-1.11 (-0.09)	***	-1.39 (-0.11)	***
Parental restriction on electronic device use	0.57 (0.05)	*	-0.42 (-0.04)		1.05 (0.10)	***
Weekday time spent on electronic devices for gaming after school closure (hour)	0.41 (0.04)	***	0.49 (0.05)	***	0.38 (0.04)	***
Weekday time spent on electronic devices for learning after school closure (hour)	0.25 (0.03)	***	0.32 (0.03)	***	0.18 (0.02)	*
Increase in weekday time spent on electronic devices for gaming after school closure (hour)	0.45 (0.03)	***	0.66 (0.05)	***	0.38 (0.03)	***
Increase in weekday time spent on electronic devices for learning after school closure (hour)	0.29 (0.03)	***	0.51 (0.05)	***	0.19 (0.02)	***

Note: ***$p<0.001$; **$p<0.01$; *$p<0.05$; B denotes unstandardized coefficients and β denotes standardized coefficients; β = 0.1 as small, β = 0.3 as medium and β = 0.5 as large according to the guidelines by Cohen.
[a] Adjusted for family SES, child's gender and age

Table 4a. Demographic factors associated with SDQ scores after school closure

	Total Difficulties		Emotional symptoms		Conduct problems		Hyperactivity/ Inattention		Peer relationship problems		Prosocial behaviour	
	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value
Overall												
Child age	-0.33	***	-0.07	***	-0.06	***	-0.12	***	-0.09	***	0.07	***
	(-0.18)	^	(-0.11)	^	(-0.10)	^	(-0.16)	^	(-0.15)	^	(0.09)	^
Child gender (male)	0.71	***	-0.11	***	0.17	***	0.41	***	0.24	***	-0.42	***
	(0.13)	^	(-0.06)	^	(0.11)	^	(0.18)	^	(0.14)	^	(-0.21)	^
Child having special educational needs	4.27	***	0.78	***	0.68	***	1.70	***	1.11	***	-0.78	***
	(0.79)	^	(0.44)	^	(0.43)	^	(0.77)	^	(0.64)	^	(-0.39)	^
Child having chronic diseases	0.81	***	0.31	***	0.09		0.19		0.23	***	-0.06	
	(0.15)	^	(0.18)	^	(0.05)		(0.09)		(0.13)	^	(-0.03)	
Child having acute health problems in the past 4 weeks	1.63	***	0.52	***	0.36	***	0.50	***	0.26	***	-0.26	***
	(0.30)	^	(0.29)	^	(0.23)	^	(0.22)	^	(0.15)	^	(-0.13)	^
Maternal age	-0.01		-0.001		-0.03		0.01		0.01		-0.04	
	(-0.001)		(0.000)		(-0.01)		(0.003)		(0.002)		(-0.01)	
Mother having mental disorders	2.12	***	0.69	***	0.49	***	0.57	***	0.37	***	-0.30	***
	(0.39)	^	(0.39)	^	(0.31)	^	(0.26)	^	(0.21)	^	(-0.15)	^
Mother having chronic diseases	0.57	***	0.19	***	0.08		0.12	*	0.17	***	-0.02	
	(0.10)	^	(0.11)	^	(0.05)		(0.06)		(0.10)	^	(-0.01)	
Paternal age	-0.09		-0.03		-0.03		-0.06		0.03		0.04	
	(-0.01)		(-0.01)		(-0.01)		(-0.02)		(0.01)		(0.01)	
Father having mental disorders	1.01	***	0.35	***	0.30	***	0.31	**	0.05		-0.15	
	(0.19)	^	(0.20)	^	(0.19)	^	(0.14)		(0.03)		(-0.08)	
Father having chronic diseases	0.53	***	0.17	***	0.06		0.22	***	0.08	*	-0.004	
	(0.10)	^	(0.10)	^	(0.04)		(0.10)	^	(0.05)		(-0.002)	
Number of siblings	-0.26	***	-0.05	***	0.08	***	-0.05	*	-0.24	***	-0.03	
	(-0.04)	^	(-0.02)	^	(0.04)	^	(-0.02)		(-0.10)	^	(-0.01)	

	M1		M2		M3		M4		M5		M6	
Number of people living with the child	0.07 (0.02)		0.01 (0.01)		0.04 (0.03)	*** ^	0.05 (0.03)	*	-0.03 (-0.02)		-0.02 (-0.01)	
Child living with people who had direct contact with confirmed COVID-19 cases	0.76 (0.14)		0.30 (0.17)		0.13 (0.08)		0.18 (0.08)		0.15 (0.09)		0.11 (0.06)	
Child living with healthcare workers	0.02 (0.003)		-0.02 (-0.01)		-0.01 (-0.003)		-0.03 (-0.01)		0.07 (0.04)		0.03 (0.01)	
Divorced/separated parents	0.96 (0.18)	*** ^	0.21 (0.12)	*** ^	0.22 (0.14)	*** ^	0.41 (0.18)	*** ^	0.12 (0.07)	*	-0.03 (-0.02)	
Family socioeconomic status index	-0.13 (-0.02)	*** ^	-0.05 (-0.03)	*** ^	-0.02 (-0.01)		-0.05 (-0.02)	**	-0.02 (-0.01)		-0.12 (-0.06)	*** ^
Average floor space per person	-0.004 (-0.05)		-0.001 (-0.03)		0.00 (-0.03)		-0.002 (-0.04)		0.00 (-0.02)		0.001 (0.05)	
Having CSSA	0.58 (0.11)	*** ^	0.22 (0.13)	*** ^	0.15 (0.10)	*	0.06 (0.03)		0.15 (0.09)	*	0.07 (0.04)	

Age 2-5

	M1		M2		M3		M4		M5		M6	
Child age	-0.45 (-0.24)	*** ^	-0.07 (-0.11)	*** ^	-0.03 (-0.06)	*	-0.06 (-0.08)	**	-0.29 (-0.47)	*** ^	0.26 (0.37)	*** ^
Child gender (male)	0.62 (0.11)	*** ^	-0.08 (-0.05)	**	0.15 (0.09)	*** ^	0.30 (0.14)	*** ^	0.24 (0.14)	*** ^	-0.44 (-0.22)	*** ^
Child having special educational needs	3.72 (0.69)	*** ^	0.66 (0.37)	*** ^	0.52 (0.33)	*** ^	1.39 (0.63)	*** ^	1.15 (0.66)	*** ^	-1.03 (-0.52)	*** ^
Child having chronic diseases	1.05 (0.19)	*** ^	0.37 (0.21)	*** ^	0.12 (0.08)		0.29 (0.13)	*	0.27 (0.15)	*** ^	-0.07 (-0.03)	
Child having acute health problems in the past 4 weeks	1.58 (0.29)	*** ^	0.49 (0.28)	*** ^	0.39 (0.25)	*** ^	0.42 (0.19)	*** ^	0.28 (0.16)	**	-0.25 (-0.13)	**
Maternal age	0.09 (0.01)		-0.01 (-0.004)		0.01 (0.005)		0.07 (0.02)		0.02 (0.01)	*** ^	-0.11 (-0.03)	**
Mother having mental disorders	2.11 (0.39)	*** ^	0.66 (0.37)	*** ^	0.45 (0.28)	*** ^	0.58 (0.26)	*** ^	0.42 (0.24)		-0.29 (-0.14)	**

	(1)	(2)	(3)	(4)	(5)	(6)
Mother having chronic diseases	0.54 *	0.22 *	0.05	0.13	0.14 ***	0.03
	(0.10)	(0.12)	(0.03)	(0.06)	(0.08) ^	(0.01)
Paternal age	-0.13	-0.04	-0.05	-0.09 *	0.05	0.05
	(-0.02)	(-0.02)	(-0.02)	(-0.03)	(0.02)	(0.02)
Father having mental disorders	1.04 **	0.36 **	0.36 **	0.23	0.10	-0.02
	(0.19)	(0.20)	(0.23)	(0.10)	(0.06)	(-0.01)
Father having chronic diseases	0.71 ***	0.23 **	0.08	0.27 **	0.13	-0.11
	(0.13) ^	(0.13)	(0.05)	(0.12)	(0.07)	(-0.06)
Number of siblings	-0.33 ***	-0.05	0.07 **	-0.11 ***	-0.25	-0.05
	(-0.05) ^	(-0.02)	(0.03)	(-0.04) ^	(-0.10)	(-0.02)
Number of people living with the child	0.13 *	0.03	0.05 **	0.07 **	-0.02 ***	-0.01
	(0.03)	(0.02)	(0.04)	(0.04)	(-0.01) ^	(-0.01)
Child living with people who had direct contact with confirmed COVID-19 cases	-0.31	-0.27	0.17	0.07	-0.28	0.27
	(-0.06)	(-0.16)	(0.11)	(0.03)	(-0.16)	(0.13)
Child living with healthcare workers	0.19	-0.02	0.02	0.09	0.10	0.02
	(0.03)	(-0.01)	(0.01)	(0.04)	(0.06)	(0.01)
Divorced/separated parents	1.33 ***	0.35 ***	0.29 ***	0.39 ***	0.30	-0.002
	(0.25) ^	(0.20) ^	(0.18) ^	(0.18) ^	(0.17)	(-0.001)
Family socioeconomic status index	-0.11 *	-0.04 **	-0.03 *	-0.06 ***	0.02 ***	-0.13 ***
	(-0.02)	(-0.02)	(-0.02)	(-0.03) ^	(0.01) ^	(-0.06) ^
Average floor space per person	-0.004	-0.001	-0.001	-0.001	-0.001	0.001
	(-0.04)	(-0.03)	(-0.04)	(-0.04)	(-0.02)	(0.05)
Having CSSA	0.37	0.06	0.08	0.02	0.20	0.02
	(0.07)	(0.04)	(0.05)	(0.01)	(0.12)	(0.01)

Age 6-12

	(1)	(2)	(3)	(4)	(5)	(6)
Child age	-0.34 ***	-0.08 ***	-0.05 ***	-0.17 ***	-0.03 ***	0.02 *
	(-0.18) ^	(-0.13) ^	(-0.10) ^	(-0.22) ^	(-0.05) ^	(0.03)
Child gender (male)	0.79 ***	-0.12 ***	0.19 ***	0.49 ***	0.24 ***	-0.40 ***
	(0.15) ^	(-0.07) ^	(0.12) ^	(0.22) ^	(0.14) ^	(-0.20) ^

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Child having special educational needs	4.48 *** (0.83) ^	0.82 *** (0.46) ^	0.75 *** (0.47) ^	1.79 *** (0.81) ^	1.12 *** (0.64) ^	-0.71 *** (-0.36) ^
Child having chronic diseases	0.70 *** (0.13) ^	0.29 *** (0.16) ^	0.07 (0.04)	0.15 (0.07)	0.20 ** (0.12)	-0.05 (-0.03)
Child having acute health problems in the past 4 weeks	1.67 *** (0.31) ^	0.55 *** (0.31) ^	0.32 *** (0.20) ^	0.56 *** (0.25) ^	0.25 *** (0.14) ^	-0.28 *** (-0.14) ^
Maternal age	-0.07 (-0.01)	0.01 (0.003)	-0.06 * (-0.02)	-0.03 (-0.01)	0.01 (0.004)	0.003 (0.001)
Mother having mental disorders	2.14 *** (0.40) ^	0.71 *** (0.40) ^	0.52 *** (0.33) ^	0.57 *** (0.26) ^	0.35 *** (0.20) ^	-0.31 *** (-0.16) ^
Mother having chronic diseases	0.60 ** (0.11)	0.19 ** (0.10)	0.10 (0.06)	0.14 (0.06)	0.18 ** (0.10)	-0.04 (-0.02)
Paternal age	-0.05 (-0.01)	-0.02 (-0.01)	-0.01 (-0.005)	-0.03 (-0.01)	0.02 (0.01)	0.03 (0.01)
Father having mental disorders	0.98 *** (0.18) ^	0.34 *** (0.19) ^	0.27 ** (0.17)	0.34 ** (0.16)	0.03 (0.02)	-0.23 * (-0.12)
Father having chronic diseases	0.45 ** (0.08)	0.14 ** (0.08)	0.05 (0.03)	0.20 *** (0.09) ^	0.05 (0.03)	0.05 (0.03)
Number of siblings	-0.20 ** (-0.03)	-0.06 * (-0.02)	0.09 *** (0.04) ^	-0.02 (-0.01)	-0.21 *** (-0.09) ^	-0.03 (-0.01)
Number of people living with the child	0.03 (0.01)	-0.004 (-0.002)	0.04 * (0.03)	0.03 (0.01)	-0.03 (-0.02)	-0.03 (-0.02)
Child living with people who had direct contact with confirmed COVID-19 cases	1.38 (0.25)	0.64 * (0.36)	0.11 (0.07)	0.29 (0.13)	0.33 (0.19)	0.11 (0.05)
Child living with healthcare workers	-0.14 (-0.03)	-0.01 (-0.01)	-0.02 (-0.01)	-0.12 (-0.05)	0.02 (0.01)	0.05 (0.03)
Divorced/separated parents	0.79 *** (0.15) ^	0.15 * (0.08)	0.19 *** (0.12) ^	0.40 *** (0.18) ^	0.06 (0.03)	-0.05 (-0.03)
Family socioeconomic status index	-0.15 ** (-0.03)	-0.05 *** (-0.03) ^	-0.01 (-0.01)	-0.04 (-0.02)	-0.05 *** (-0.03) ^	-0.12 *** (-0.06) ^

Average floor space per person	-0.004 (-0.05)	-0.001 (-0.03)	*	0.00 (-0.03)		-0.002 (-0.05)	0.00 (-0.03)	0.001 (0.04)
Having CSSA	0.64 (0.12)	0.29 (0.16)	*** ^	0.18 (0.11)	*	0.07 (0.03)	0.10 (0.06)	0.11 (0.07)

Note: *** $p < 0.001$, ** $p < 0.01$, *$p < 0.05$, ^$p < 0.003$ (Bonferroni adjusted alpha levels of 0.003 [.05/19]); B denotes unstandardized coefficients and β denotes standardized coefficients; $\beta = 0.1$ as small, $\beta = 0.3$ as medium and $\beta = 0.5$ as large according to the guidelines by Cohen.
[a] Mutually adjusted models

Table 4b. Demographic factors associated with PSS after school closure

	Overall		Age 2-5		Age 6-12	
	B (β) [a]	p-value	B (β) [a]	p-value	B (β) [a]	p-value
Child age	0.003		0.24	**	-0.17	***
	(0.001)		(0.06)		(-0.05)	^
Child gender (male)	0.39		0.28		0.49	***
	(0.04)		(0.03)		(0.05)	^
Child having special educational needs	4.20	***	4.06	***	4.17	***
	(0.40)	^	(0.39)	^	(0.40)	^
Child having chronic diseases	1.25	***	2.57	***	0.74	
	(0.12)	^	(0.25)	^	(0.07)	
Child having acute health problems in the past 4 weeks	2.52	***	2.32	***	2.65	***
	(0.24)	^	(0.22)	^	(0.25)	^
Maternal age	-0.11		0.07		-0.28	
	(-0.01)		(0.004)		(-0.02)	
Mother having mental disorders	5.33	***	5.49	***	5.25	***
	(0.51)	^	(0.52)	^	(0.50)	^
Mother having chronic diseases	0.83	**	1.26	*	0.67	
	(0.08)		(0.12)		(0.06)	
Paternal age	0.12		-0.09		0.28	
	(0.01)		(-0.01)		(0.02)	
Father having mental disorders	1.41	**	0.15		2.07	***
	(0.13)		(0.01)		(0.20)	^
Father having chronic diseases	0.44		0.63		0.36	
	(0.04)		(0.06)		(0.03)	
Number of siblings	0.44	**	0.23		0.54	***
	(0.03)		(0.02)		(0.04)	^
Number of people living with the child	-0.23	**	-0.26	*	-0.22	
	(-0.03)		(-0.03)		(-0.02)	
Child living with people who had direct contact with confirmed COVID-19 cases	0.55		1.35		0.20	
	(0.05)		(0.13)		(0.02)	
Child living with healthcare workers	0.39		0.47		0.35	

	(0.04)		(0.04)		(0.03)	
Divorced/separated parents	2.19	***	2.22	***	2.19	***
	(0.21)	^	(0.21)	^	(0.21)	^
Family socioeconomic status index	-0.15		-0.11		-0.16	
	(-0.01)		(-0.01)		(-0.02)	
Average floor space per person	-0.01		-0.01		-0.01	
	(-0.04)		(-0.04)		(-0.04)	
Having CSSA	0.20		1.24		-0.24	
	(0.02)		(0.12)		(-0.02)	

Note: *** $p < 0.001$, ** $p < 0.01$, *$p < 0.05$, ^$p < 0.003$ (Bonferroni adjusted alpha levels of 0.003 [.05/19]); B denotes unstandardized coefficients and β denotes standardized coefficients; $\beta = 0.1$ as small, $\beta = 0.3$ as medium and $\beta = 0.5$ as large according to the guidelines by Cohen.
[a]Mutually adjusted model