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A longitudinal study of child adjustment during the COVID-19 pandemic: the protective role of the parent-child relationship in middle childhood

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ABSTRACT

This longitudinal study assessed how parent-child relationship quality during the first COVID-19 lockdown was related to changes in internalizing, externalizing, and sleep problems during the first months of the pandemic: during lockdown, partial deconfinement, and total deconfinement. Participants included 167 children (9–12 year) and their parents recruited in the province of Quebec, Canada. Child behavior problems decreased between lockdown and the two deconfinement assessments, but more sleep and behavior problems were associated with lower levels of relationship quality (more conflict, less closeness, and more insecure attachment). Significant interaction effects showed that changes in externalizing and sleep problems varied as a function of parent-child relationship. Results support the critical importance of the parent-child relationship with regard to child adjustment in middle childhood in times of crisis such as a pandemic. They also highlight resilience in children aged 9 to 12, with a decrease in problems over time.

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COVID-19 lockdown; internalizing; externalizing; sleep; attachment; parent-child relationship

Introduction

COVID-19 lockdown measures, which represented a dramatic change in families' habits, were particularly restrictive for children who were forced to stay at home with their parents for several weeks at the beginning of the pandemic in March 2020. Prolonged isolation from their peers, changes in their lifestyle and the uncertainty of a pandemic increased internalizing, externalizing and sleep problems in children when compared to data collected prior to the COVID-19 pandemic (Bussières et al., 2021; Deng et al., 2023). Longitudinal studies on the evolution of children's maladaptation over time during the

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COVID-19 pandemic have primarily compared data collected at the onset of the pandemic and before the pandemic, and studies assessing changes between lockdown and deconfinement periods are much more limited. The few studies that have examined the evolution of maladaptation over time after the onset of the pandemic report mixed results although most of them revealed an increase in problems at the start of the pandemic, followed by a decrease (for a scoping review, Wolf & Schmitz, 2024). These mixed results call for a better understanding of the factors that may explain variations in maladaptation over time. Considering the important role played by the parent-child relationship in middle childhood (Brumariu & Kerns, 2022) and the fact that children spent most of their time at home with their parents during the first months of the COVID-19 pandemic, it is crucial to know to what extent parent-child relationship quality during lockdown predicted child adjustment in the following months of the pandemic.

Evolution of child maladaptation over time during the COVID-19 pandemic

More than a dozen meta-analyses have been published on mental health, behavior, and sleep problems of children and adolescents during the COVID-19 pandemic. These meta-analyses report an increase in problems when compared to pre-COVID data and significant associations with lockdown measures (e.g. Bussières et al., 2021; Deng et al., 2023; Ludwig-Walz et al., 2022; Panda et al., 2020; Raccanello et al., 2023; Richter et al., 2022). In general, the effect sizes were found to be small to moderate and stronger relations were obtained with greater use of electronic devices (Deng et al., 2023; Richter et al., 2022), when pandemic-related restrictions were more severe (lockdown and school closure; Ludwig-Walz et al., 2022), and when symptoms were measured through child and adolescent self-reports (Bussières et al., 2021; Raccanello et al., 2023). A meta-regression analysis was conducted to determine whether the magnitude of the effect varied according to when the data was collected during the pandemic (Deng et al., 2023). The prevalence of mental health symptoms increased more steeply between January and June 2020, when sanitary measures intensified, before starting to stabilize during the following summer and fall, when restrictions were loosened.

A scoping review on the longitudinal effect of the COVID-19 pandemic on child and adolescent mental health reported a decrease in symptoms related to externalizing, internalizing or sleep problems over the course of the pandemic in 13 out of the 69 studies included in the review (Wolf & Schmitz, 2024). A reduction in internalizing, externalizing and/or sleep problems was found in 10 studies when data collected during the lockdown/pandemic restrictions were compared to those obtained during or after the restrictions were lifted. Some symptoms however did not decrease in 5 out of the 13 studies with children 9 years or older. In one study that assessed anxiety, depression, behavioral problems and sleep problems of children and adolescents in several countries at three time points during the first months of the pandemic (2 weeks, 5 weeks, and 8 weeks after the beginning of lockdown), results varied according to the level of pandemic restrictions (Orgilés et al., 2021). Fewer changes were observed both in the country experiencing the most liberal restrictions and in the country with the most severe COVID-19 restrictions. In the other four studies, symptoms of inattention/hyperactivity (Breaux et al., 2021; Raw et al., 2021) and anxiety and depression (Fung et al., 2021; Liang et al., 2021) remained stable or increased in the first months of the pandemic. These

results call for an investigation of moderators likely to influence change in child maladaptation in the early months of the COVID-19 pandemic.

The parent-child relationship as a protective factor

According to attachment theory, children need to rely on their parents in times of stress to alleviate their distress and help develop adequate emotion regulation and coping strategies (Cassidy, 2016). Despite the fact that middle childhood is characterized by a greater autonomy and an increase in emotional and social abilities, children still turn to their parents for reassurance and regulation of their emotions and behaviors (Stifter & Augustine, 2019). Attachment security remains central to children's adjustment during this developmental period (Brumariu & Kerns, 2022), and it has been related to more positive (e.g. responsiveness, autonomy support, affection, closeness, warmth) and less negative (e.g. harsh, controlling, hostile) parenting behaviors (Koehn & Kerns, 2018). During a crisis or a traumatic situation – even if it is indirectly experienced through the media – parents' emotional and physical availability is crucial to children's response to stress, but it can be compromised by parents' own feelings of being threatened or overwhelmed by the context (Schechter & Davis, 2007). According to Bowlby (1951), when the parent is present but unable to provide care and support, it generates acute anxiety, anger and depression in the child that can have long term consequences on child wellbeing. Hence, insecure attachment is likely to be associated with various behavior and mental health problems. Because sleep problems and emotional and behavioral disorders are interrelated (Morales-Muñoz & Gregory, 2023), it has been suggested that insecure attachment can also predict sleep problems. One conceptual framework linking the two concepts is that insecure attachment is related to greater physiological arousal, particularly during times of stress, which can disrupt sleep due to difficulty down-regulating negative affect at bedtime (El-Sheikh et al., 2017). In the course of a long-term public health crisis such as the COVID-19 pandemic, the different parent-child relationship dimensions may be particularly important for the adjustment of middle-aged children. Being able to rely on a parent who is affectionate, warm and who does not elicit or exacerbate conflicts can contribute to the child's emotional security. Moreover, attachment security is known to moderate the experience of fear by enabling the child to develop in a safe haven where feelings (including fears) are discussed openly, which helps to alleviate the sense of threat (Steele, 2020).

Studies assessing the concurrent association between the quality of parent-child relationship and child maladaptation at the beginning of the COVID-19 pandemic (April-May 2020) showed that more conflict and parental hostility and less closeness were related to more child stress (Russell et al., 2020) and externalizing problems (Whittle et al., 2020) in large age-range samples of children (0–18 years and 5–17 years, respectively). Others have shown that more conflict and less closeness in the parent-child relationship between March and May 2020 were associated with greater internalizing and externalizing problems in school-age children (6–12 years; Bate et al., 2021). A study conducted a few months following the beginning of the pandemic (July-September 2020) showed that parental verbal hostility was associated with more sleep disturbances in children (*M*age = 10.25 years), while more parental physical coercion and verbal hostility and less parental autonomy support were related to more

child internalizing and externalizing problems (Oliveira et al., 2022). Few studies have assessed attachment during the first wave of COVID-19. One study conducted during lockdown (March-May 2020) showed that secure attachment representations were not associated to behavior problems but that disorganized attachment representations were related to more internalizing problems in 12–17 year-old adolescents (Muzi et al., 2021). Another study conducted when COVID-19 restrictions were loosened (June-August 2020) revealed a moderate association between attachment security to parents and symptoms of depression, irritability and anxiety in 11–17 year-old adolescents (Laurier et al., 2021). In the same sample of 9–12 year-old children as the current study, greater attachment security was associated with fewer internalizing and externalizing problems during the first lockdown (April-May 2020), while less conflict in the parent-child relationship was associated with fewer externalizing problems (Dubois-Comtois et al., 2021).

Considering that quality of the parent-child relationship in general, and attachment security in particular, can act as a protective factor that contributes to adaptation in the face of adversity (Rutter & Sroufe, 2000), one would expect that parent-child relationship quality assessed before COVID-19 would predict child adjustment during the pandemic. Hamatani et al. (2022) showed that higher parental monitoring and supervision behaviors before the pandemic were linked to fewer internalizing and externalizing problems in school-age children during the pandemic (March 2020-January 2021). Others showed that attachment security in adolescents prior to the COVID-19 pandemic predicted lower levels of irritability and loneliness (Janssens et al., 2021) and internalizing and externalizing problems (Coulombe & Yates, 2022) during the COVID-19 lockdown (April-May 2020). These studies highlight the protective roles of attachment security and positive parent-child relationships, but they do not provide information regarding how these relational factors are linked to child maladaptation over time during the COVID-19 pandemic. A study showed that more positive and less negative parent-child relationship quality during lockdown predicted fewer overall behavior problems in 3–11 year-old children when restrictions were loosened (Essler et al., 2021). Also, parent-child connectedness in May-July 2020 predicted, two months later, longer sleep duration and less anxiety and depression in children aged 9–11 years (McArthur et al., 2023). To date, no study has assessed how attachment security during lockdown predicts child adjustment later during the pandemic.

Objectives of the current study

Overall, the number of studies in middle childhood that have assessed the association between parent-child relationship quality during lockdown and changes in child adjustment over the COVID-19 pandemic are very limited, and none included a measure of child attachment. Moreover, studies conducted during the pandemic generally relied on the same respondent for all measures (mostly parents and sometimes adolescents), increasing the risk of overestimating effect sizes.

The aim of the current study was to investigate the evolution of child internalizing, externalizing, and sleep problems during lockdown, partial deconfinement and complete deconfinement as a function of parent-child relationship quality (conflict, closeness and attachment security) during lockdown by considering parents' and children's perspectives. Surveys were completed over the phone by parents and children during the first

lockdown of 2020 (between April 20 and May 18), two months later during partial deconfinement (between June 14 and July 17), and finally during total deconfinement (between August 17 and September 16) in Quebec (Canada). Based on the literature, we expected decreases in child internalizing, externalizing, and sleep problems as the pandemic progressed (with the reduction of restrictive measures). We also expected that children with a greater quality of parent-child relationship during lockdown (less conflict, more closeness and more attachment security) would present fewer problems over time. Finally, we expected that children who had a higher quality of parent-child relationship during lockdown would show a greater reduction in problems (internalizing, externalizing, sleep problems) over time when compared to children with a lower quality of parent-child relationship during lockdown.

Method

Participants

Participants were drawn from an initial sample recruited in Quebec (Canada) that included 144 families with 180 children during the COVID-19 lockdown (T1: April-May 2020). Of the 144 families, 135 parents with 167 children between the ages of 9 and 12 participated in all three measurement time points. Among these 135 families, 3 families had 3 children who participated in the study and 27 families had 2 children who participated in the study. With the exception of sociodemographic characteristics (i.e. family income and parents' age and education), the measures used in the current study are child-centered and therefore independent. Consequently, all the participants who completed the three assessments were included in the current study.

The final sample included 167 children (83 boys, 84 girls) aged 9 to 12 ($M = 10.38$; $SD = 1.12$) and 135 parents (121 mothers, 14 fathers) with a mean age of 40.02 ($SD = 4.99$; range from 27 to 59 years). In average, parents had 15.93 years of education ($SD = 3.31$). One hundred and thirty-two children (79%) were living in a two-parent family. Family income before the COVID-19 pandemic was distributed as follows: 11 (8%) earned a yearly income under 30,000$ CAN; 15 (11%) earned between 30,000$ and 49,999$ CAN; 19 (14%) earned between 50,000$ and 69,999$ CAN; 16 (12%) earned between 70,000$ and 89,999$ CAN; 27 (20%) earned between 90,000$ and 110,000$ CAN; 45 (33%) earned more than 110,000 $ CAN. Two families refused to disclose their annual income. In Quebec, the median income of a two-parent family with one child was 81,810 $ CAN in 2016 (Institut de la Statistique du Québec, 2019). Our sample is therefore mainly composed of middle- to high-income families before the COVID-19 pandemic (M income = 103,464; $SD = 62,462$). A majority of parents (86.7%) were born in Canada, 8.1% in Central or South America, 3% in Africa, 1.5% in the Middle East, and .7% in Europe. In 2016, 14.5% of families in Quebec were immigrants (Gouvernement du Québec, 2021), suggesting our sample is representative of the Quebec population.

Families who participated in all three assessment time points were similar to those who dropped out (6% attrition) on all sociodemographic variables (t between 0.07 and 0.35 and $\chi^2 = 0.06$, all $ps > .05$) except for income prior to COVID-19 ($t = 2.66$, $p < .001$) that was higher in families that continued their involvement in the study.

Procedure

Participants were recruited through announcements posted on social networks (e.g. sports associations for children and parents, community centers) or sent by email through school administrations during the COVID-19 lockdown (between April and May, 2020). Several school boards in different regions of Quebec were contacted during the first weeks of the pandemic and 9 of them accepted to transfer information related to the research project. Inclusion criteria were to be a parent living with at least one child aged 9 to 12 years and being under lockdown restrictions during the first assessment. Parents had to contact the research team to participate in the study and online informed consent was obtained from all participating parents and children before the survey was completed. The assessment was conducted over the phone with the parents and the children separately. They were contacted again by phone to complete the second (progressive deconfinement: between June and July, 2020), and third measurements (total deconfinement: between August and September, 2020). At T2, 73.7% of children were not in school at the time of the assessment and, at T3, 63.5% of families completed the assessment prior to the beginning of the school year. Families received a 10$ compensation at each assessment time for their participation in the project. The study was approved by Université du Québec à Trois-Rivières' research ethics committee (CER-20-266-10.20).

COVID-19 restrictions in Quebec

Faced with the COVID-19 pandemic, most governments around the world established a lockdown in March 2020, and closed schools and daycare centers to minimize the virus transmission through social distancing and isolation. In Quebec, the first case of COVID-19 appeared on 27 February 2020. A state of health emergency was declared on 13 March 2020. Daycare centers and schools were closed on 16 March 2020, while sports, leisure, and religious gatherings were already prohibited. On 22 March 2020, indoor and outdoor gatherings were banned, shopping centers and other businesses were closed (except for essential services such as food and health), people were encouraged to limit travel and asked to avoid contacts, even outside. It took until the end of May for a gradual reduction of the measures put in place. Daycare services and elementary schools reopened between May 11 and June 1 in small towns but remained closed until the start of the next school year (until September 2020) in the Greater Montreal area, the most populous metropolitan area in Quebec. Shops, restaurants, and leisure activities gradually reopened during the months of June and July and most measures were lifted. In August, bigger gatherings were allowed and in September school started with some requirements (stable groups and mandatory masks for all pupils from grade 5 upwards when circulating within the school). See Figure 1 for a timeline of restrictions in Quebec and when the data was collected.

Measures

Sociodemographic characteristics and parent-child relationship quality were measured at the beginning of the lockdown while child internalizing, externalizing and sleep problems were assessed at the three time points.

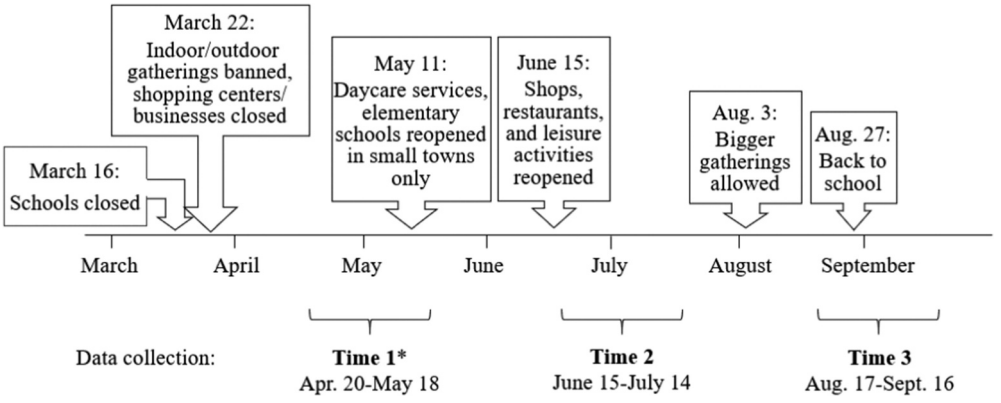

Figure 1. Data collection and timeline of the COVID-19 restrictions in Quebec during the first months of the Pandemic. Note. *Time 1 recruitment ended before May 11th in small towns.

Sociodemographic characteristics

Parents completed a sociodemographic questionnaire that provided information on family background (family income before the COVID-19 pandemic, parental education, and each family members' age and sex). The questionnaire also included a question on daily use of screen time by children considering it has been related to child maladaptation (Deng et al., 2023; Richter et al., 2022).

Parent-child conflict and closeness

Parents completed the Child-Parent Relationship Scale – Short Form (CPRS-SF; Pianta, 1992). The CPRS-SF is composed of 15 items rated on a 5-point scale that cover two parent-child dimensions: Closeness (7 items; e.g. I share an affectionate, warm relationship with my child) and Conflict (8 items; e.g. My child and I always seem to be struggling with each other). Higher scores indicate more closeness and more conflict in the relationship. The CPRS-SF has good psychometric properties (Driscoll & Pianta, 2011). Cronbach alphas in the current sample are good for the two scales (.79 and .71, respectively). In order to create a dichotomous score for each scale, the sample was cut at the median to create two groups. For closeness in the parent-child relationship (*Mdn* = 32), the group with higher closeness included children with a score greater than or equal to 32. For conflict in the parent-child relationship (*Mdn* = 15), the group with the highest level of conflict included children with a score greater than 15.

Attachment security to parents

Children completed the revised short version of the Inventory of Parent and Peer Attachment (IPPA-R) validated for children aged 9 to 15 years (Vignoli & Mallet, 2004). This short self-report measure includes 14 items assessing the security of attachment to parents only (e.g. My parents help me to understand myself better) using a 3-point Likert scale (always true, sometimes true, and never true). The items were summed into a total security score, with higher scores reflecting more attachment security. Cronbach's alpha in this sample is .72. The revised version of the IPPA showed good reliability and validity (Gullone & Robinson, 2005; Vignoli & Mallet, 2004). In order to create a dichotomous

attachment score, the sample was cut at the median (*Mdn* = 37) to create two attachment groups (less secure vs. more secure). Children with a more secure attachment had a score greater than or equal to 37.

Internalizing problems

Child internalizing problems were self-reported using the 32 items of the Youth Self-Report (YSR; Achenbach & Rescorla, 2001), which was originally designed to assess problems in youth aged 11–18 but has since been validated for children as young as 7 (Ebesutani et al., 2011). The 32 items related to anxiety, depression, somatization, and withdrawal problems were scored by the child on a 3-point scale (not true, somewhat or sometimes true, very true or often true). These 32 item responses were summed and converted into a *T*-score (normalized for child sex and age). The YSR is a widely used measure of psychological functioning in childhood and has excellent psychometric properties (Achenbach & Rescorla, 2001). Cronbach's alpha for the scale in this study is very good at each assessment time (between .86 and .87). Child internalizing problems were assessed through child self-reports because it has been shown that parent reports may underestimate these problems (Lagattuta et al., 2012).

Externalizing problems

Child externalizing problems were assessed by parents using the 42 items of the externalizing scale of the Child Behavior Checklist for Ages 6 to 18 (CBCL/6–18; Achenbach & Rescorla, 2001). The 42 items related to attention, delinquency, aggressiveness, opposition and conduct problems were scored by the parent on a 3-point scale (not true, somewhat or sometimes true, very true or often true). These 42 item responses were summed and converted into a *T*-score (normalized for child sex and age). The CBCL/6–18 is a widely used measure of psychological functioning in childhood and adolescence and has excellent psychometric properties (Achenbach & Rescorla, 2001). Cronbach's alpha for the scale in this study is very good to excellent at each assessment time (between .89 and .91). Considering that parent- and child-reported externalizing problems are moderately correlated and load on one factor (Moss et al., 2006), child externalizing problems were assessed by the parent to limit child fatigue and the time children spent answering questions.

Sleep problems

Child sleep problems were self-reported using the Youth Self-Report (YSR; Achenbach & Rescorla, 2001). The 4 items related to sleep problems (nightmares; sleep less than others; trouble sleeping and feeling overtired) were scored by the child on a 3-point scale (not true, somewhat or sometimes true, very true or often true). These four items were summed, as already validated in the literature, to represent child sleep problems (Fatima et al., 2017; Reigstad et al., 2010). Cronbach's alphas in this sample are between .53 and .56, which is consistent with what was found in other studies (e.g. $\alpha = .48$ in Fatima et al., 2017). This low internal consistency is not considered problematic because it reflects a combination of different dimensions of sleep problems (Gregory et al., 2008). Other self-reported measures of sleep problems also provide an aggregated overall score of independent sleep behaviors as it reflects the level of sleep disruption (e.g. Bruni et al., 1996; Owens et al., 2000).

Statistical analyses

Data were analyzed using SPSS v.28 (Armonk, NY). Pearson's correlations and *t*-tests were used to assess associations between sociodemographic characteristics and child maladaptation (internalizing, externalizing and sleep problems) in order to identify potential covariates. *T*-tests and chi-square analyses were then used to compare parent-child relationship groups on sociodemographic characteristics. Finally, repeated measures ANCOVAs (2 groups X 3 time points) were conducted on child maladaptation over time (T1 = during COVID-19 lockdown; T2 = partial deconfinement; T3 = total deconfinement) as a function of parent-child relationship quality (less vs. more conflict; less vs. more closeness; less vs. more attachment security) during lockdown. The same analyses were repeated 1) by including only families for which the mother was the respondent and 2) by including only one child in families for which several children participated in the study. An a-priori power analysis was conducted before data analyses. Using an alpha of .05, a power of .80, and a small effect size, it was estimated that 162 participants were necessary.

Results

Missing data

Family income before COVID-19 was missing for two participants who preferred not to disclose this information. These missing data for family income were replaced by the average income of the other participants. Two participants also had a missing item regarding sleep problems. The missing item was replaced by the average of the other three sleep problem items of these participants.

Descriptive and preliminary analyses

Correlation analyses were conducted on the different dimensions of the parent-child relationship at T1. The association between parent-child conflict and closeness is moderate ($r = -.35$, $p < .001$) while the association between attachment security and the two former variables is weak to moderate (with parent-child conflict: $r = -.28$, $p < .001$; with parent-child closeness: $r = .17$, $p = .025$). Descriptive statistics and correlations between sociodemographic variables and child maladaptation outcomes are presented in Table 1. Correlation analyses revealed that parent education was negatively associated with child internalizing problems at the three time points as well as with child externalizing problems during lockdown and child sleep problems during partial deconfinement. Family income before COVID-19 was negatively linked to child internalizing problems during partial and total deconfinement. Daily screen time use was positively related to sleep problems during lockdown. *T*-tests were conducted to assess if child maladaptation differed as a function of child sex, marital status, and parents' birth country (Canada vs. others). Results revealed that child sex was only related to child internalizing problems during partial deconfinement ($t = -2.32$, $p = .021$), with girls having more internalizing problems than boys. No other associations were found with child sex (*t* between 0.13 and 1.89, *p*s > .05). Child maladaptation outcomes did not vary as a function of marital status (*t* between 0.01 and 1.43, *p*s > .05) or parent's birth country (*t* between 0.01 and 1.14, *p*s >

Table 1. Descriptive data and correlations between study variables and sociodemographic characteristics.

	Mean (*SD*)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Child age (months)	129.84 (14.05)	–											
2. Parent education (y)	15.93 (3.31)	.04	–										
3. Family income	103,464 (62,462)	.01	.50***	–									
4. Daily screen time (h)	4.16 (2.11)	.20*	−.05	.03	–								
5. Externalizing T1	55.89 (10.63)	−.06	−.23**	−.09	.00	–							
6. Externalizing T2	52.41 (11.22)	−.05	−.07	−.11	.00	.83***	–						
7. Externalizing T3	51.34 (10.56)	−.10	−.11	−.03	.02	.81***	.83***	–					
8. Internalizing T1	51.42 (9.20)	.09	−.38***	−.14	.07	.31***	.20*	.26***	–				
9. Internalizing T2	44.53 (9.47)	−.02	−.34***	−.20*	.06	.27***	.18*	.24**	.66***	–			
10. Internalizing T3	45.56 (9.30)	−.12	−.34***	−.23**	.09	.34***	.28***	.31***	.57***	.71***	–		
11. Sleep problems T1	2.07 (1.69)	.01	−.13	−.03	.17*	.25***	.25**	.27***	.66***	.51***	.46***	–	
12. Sleep problems T2	1.59 (1.50)	−.02	−.16*	−.11	.06	.22**	.20**	.19*	.45***	.64***	.48***	.54***	–
13. Sleep problems T3	1.39 (1.44)	−.07	−.15	−.13	.10	.24**	.24**	.27***	.41***	.43***	.67***	.48***	.62***

T1 = during lockdown; T2 = during partial deconfinement; T3 = during total deconfinement.
* $p < .05$. ** $p < .01$. *** $p < .001$.

.05). To make sure that going back to school at T2 and starting the school year at T3 did not influence symptoms, *t*-tests were also performed according to the time the assessment was conducted (before vs. after school started). No significant differences were found on externalizing, internalizing and sleep problems at T2 and T3 (*t* between .07 to 1.25, *p*s > .05). Thus, analyses on child externalizing problems were conducted with parent education as a covariate. Analyses on child internalizing problems included child sex, parent education, and family income before COVID-19 as covariates. Analyses on sleep problems were conducted with parent education and daily screen time use as covariates.

T-tests and chi-square analyses were conducted to compare parent-child relationship groups on sociodemographic variables (see Table 2). T-tests analyses revealed that the two parent-child closeness groups differed according to child age, daily screen time use, and family income before COVID-19. In the high closeness group, children were younger, spent less time using screen and were living in a family with a greater income as opposed to children in the low closeness group. Chi-square analyses also showed that children in the high closeness group were more likely to be girls and to be living in a two-parent household than children in the low closeness group. T-tests analyses revealed that child age and parent education were related to attachment security. Children in the more secure group were older and had more educated parents than those in the less secure group. The parent-child conflict groups did not differ on sociodemographic variables.

Table 2. Comparisons of parent-child relationship groups on sociodemographic characteristics.

	Parent-child conflict			Parent-child closeness			Attachment security		
	Less ($n = 87$) *M* (*SD*)	More ($n = 80$) *M* (*SD*)	*t*-test	Less ($n = 83$) *M* (*SD*)	More ($n = 84$) *M* (*SD*)	*t*-test	Less ($n = 83$) *M* (*SD*)	More ($n = 84$) *M* (*SD*)	*t*-test
Child age (months)	130.69 (14.09)	128.93 (14.04)	0.81	132.39 (14.32)	127.33 (13.39)	2.36*	127.60 (13.59)	132.06 (14.22)	−2.07*
Parent education	15.93 (3.24)	15.94 (3.40)	−0.02	15.57 (3.14)	16.29 (3.45)	−1.40	15.36 (2.88)	16.50 (3.61)	−2.26*
Family income	97,672 (51,712)	109,762 (72,178)	−1.25	89,156 (50,951)	117,601 (69,506)	−3.01**	94,343 (48,253)	112,476 (73,055)	−1.90
Daily screen time	4.08 (2.12)	4.25 (2.11)	−0.52	4.54 (2.20)	3.78 (1.96)	2.35*	4.30 (2.22)	4.03 (2.00)	.76
	n (%)	*n* (%)	Chi^2	*n* (%)	*n* (%)	Chi^2	*n* (%)	*n* (%)	Chi^2
Child sex			2.64			7.33**			1.35
Girls	49 (56%)	35 (44%)		33 (40%)	51 (61%)		38 (46%)	46 (55%)	
Boys	38 (44%)	45 (56%)		50 (60%)	33 (39%)		45 (54%)	38 (45%)	
Marital status			1.11			8.36**			0.37
Single	21 (24%)	14 (18%)		25 (30%)	10 (12%)		19 (23%)	16 (19%)	
Married/ partnered	66 (76%)	66 (82%)		58 (70%)	74 (88%)		64 (77%)	68 (81%)	

* $p < .05$. ** $p < .01$.

Longitudinal changes in child maladaptation as a function of parent-child conflict

Results of repeated measures ANCOVAs (2 conflict groups X 3 time points) demonstrated a significant time effect for internalizing and externalizing problems (see Table 3). Post hoc pairwise comparisons with Bonferroni correction showed that externalizing and internalizing problems decreased between lockdown and partial deconfinement (*ps* < .001) and between lockdown and total deconfinement (*ps* < .001). However, the difference between partial and total deconfinement was not significant for either outcome (*ps* > .05). The repeated measures ANCOVA revealed no significant change in child sleep problems over time.

A significant parent-child conflict group effect was found for externalizing, internalizing, and sleep problems (see Table 3), with children in the low conflict group showing fewer problems on all three outcomes in comparison to those in the high conflict group.

A significant interaction effect between parent-child conflict and time was also found for child externalizing problems (see Table 3). Post hoc pairwise comparisons with Bonferroni correction showed that externalizing problems decreased over time for both groups between lockdown and partial deconfinement (*ps* < .001) and between lockdown and total deconfinement (*ps* < .001). However, externalizing problems significantly decreased between partial and total deconfinement in the high conflict group ($p = .005$), but not in the low conflict group ($p = 1.00$; see Figure 2). Results yielded no significant group X time effect on internalizing and sleep problems.

Table 3. Repeated measures ANCOVAs on child maladaptation as a function of parent-child conflict.

	Less conflict $n = 87$ M (SD)	More conflict $n = 80$ M (SD)	ANCOVA		
			Effect	F ratio	Partial η^2
Externalizing problems[a]					
T1	49.56 (8.74)	62.76 (7.89)	T	13.77***	.08
T2	46.37 (8.59)	58.99 (10.01)	G	92.45***	.36
T3	46.41 (9.23)	56.69 (9.26)	GxT	5.12**	.03
Internalizing problems[b]					
T1	49.44 (8.47)	53.58 (9.53)	T	9.41***	.06
T2	43.51 (9.56)	45.65 (9.29)	G	8.56**	.05
T3	44.02 (8.64)	47.24 (9.74)	GxT	0.61	.004
Sleep problems[c]					
T1	1.68 (1.54)	2.50 (1.74)	T	1.04	.01
T2	1.43 (1.50)	1.78 (1.49)	G	8.11**	.05
T3	1.16 (1.52)	1.66 (1.32)	GxT	2.05	.01

T1 = during lockdown; T2 = during partial deconfinement; T3 = during total deconfinement; T = Time; G = Group; GxT = Group x Time.
[a]Controlling for parent education. [b]Controlling for parent education, child sex and family income before COVID-19. [c]Controlling for parent education and daily screen time use.
** $p < .01$. *** $p < .001$.

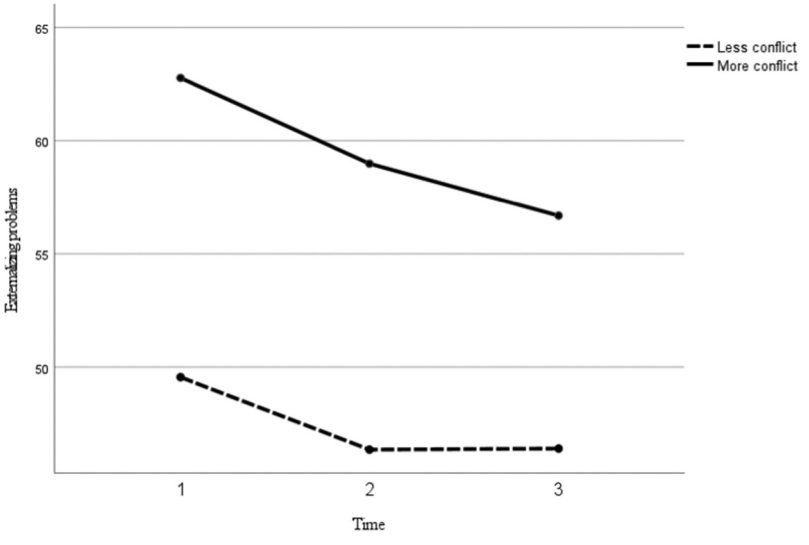

Figure 2. Change in externalizing problems over time as a function of parent-child conflict. Note. Scores of externalizing problems include parent education as a covariate.

Longitudinal changes in child maladaptation as a function of parent-child closeness

Similar to the previous analyses, results of repeated measures ANCOVAs (2 closeness groups X 3 time points) revealed a significant time effect for internalizing and externalizing problems (see Table 4). Post hoc pairwise comparisons with Bonferroni correction showed that externalizing and internalizing problems decreased between lockdown and partial deconfinement ($ps < .001$) and between

Table 4. Repeated measures ANCOVAs on child maladaptation as a function of parent-child closeness.

	Less closeness $n = 83$ M (SD)	More closeness $n = 84$ M (SD)	ANCOVA		
			Effect	F ratio	Partial η^2
Externalizing problems[a]					
T1	57.94 (10.65)	53.86 (10.26)	T	13.21***	.08
T2	54.54 (11.63)	50.31 (10.45)	G	5.62*	.03
T3	53.10 (10.84)	49.60 (10.03)	GxT	0.34	.002
Internalizing problems[b]					
T1	53.01 (9.65)	49.85 (8.50)	T	8.87***	.05
T2	45.37 (9.64)	43.70 (9.27)	G	2.13	.01
T3	46.51 (9.94)	44.63 (8.58)	GxT	1.04	.01
Sleep problems[c]					
T1	2.34 (1.84)	1.81 (1.49)	T	0.70	.00
T2	1.65 (1.53)	1.54 (1.48)	G	1.29	.01
T3	1.57 (1.47)	1.24 (1.41)	GxT	1.18	.01

T1 = during lockdown; T2 = during partial deconfinement; T3 = during total deconfinement; T = Time; G = Group; GxT = Group x Time.
[a]Controlling for parent education. [b]Controlling for parent education, child sex and family income before COVID-19. [c]Controlling for parent education and daily screen time use.
* $p < .05$. *** $p < .001$.

lockdown and total deconfinement ($ps < .001$). The difference between partial and total deconfinement was not significant for either outcome ($ps > .05$). There was no change in child sleep problems over time.

A significant parent-child closeness group effect was found for externalizing problems. Children in the high closeness group had fewer externalizing problems than those in the low closeness group (see Table 4). No group differences were found for internalizing and sleep problems and no significant interaction effects between parent-child closeness and time on child maladaptation outcomes were found (see Table 4).

Longitudinal changes in child maladaptation as a function of attachment security

The significant time effect shown in previous analyses for internalizing and externalizing problems was also found here (see Table 5).

A significant attachment group effect was found for internalizing problems (see Table 5), with children in the more secure attachment group showing fewer internalizing problems than those in the less secure attachment group.

Results also demonstrated a significant attachment X time interaction on child sleep problems (See Table 5). Post hoc pairwise comparisons with Bonferroni correction showed that, in comparison with children in the less secure group, those in the more secure group had fewer sleep problems during lockdown ($p < .001$) but not during partial deconfinement ($p = .52$) and total deconfinement ($p = .75$). Moreover, in the less secure attachment group, sleep problems decreased between lockdown and partial deconfinement ($p < .001$) and between lockdown and total deconfinement ($p < .001$), whereas in the more secure attachment group sleep problems did not change over time ($p > .05$) (See Figure 3).

Table 5. Repeated measures ANCOVAs on child maladaptation as a function of attachment security.

	Less secure $n = 83$ M (SD)	More secure $n = 84$ M (SD)	ANCOVA		
			Effect	F ratio	Partial η^2
Externalizing problems[a]					
T1	57.01 (11.45)	54.77 (9.69)	T	12.96***	.07
T2	53.06 (12.83)	51.77 (9.41)	G	0.90	.01
T3	52.52 (10.92)	50.17 (10.12)	GxT	0.49	.003
Internalizing problems[b]					
T1	54.31 (8.95)	48.56 (8.58)	T	9.59***	.06
T2	47.39 (8.48)	41.71 (9.59)	G	16.11***	.09
T3	48.06 (9.02)	43.10 (8.95)	GxT	0.48	.03
Sleep problems[c]					
T1	2.54 (1.68)	1.61 (1.57)	T	0.18	.00
T2	1.71 (1.43)	1.48 (1.57)	G	2.47	.02
T3	1.41 (1.34)	1.39 (1.55)	GxT	9.03***	.05

T1 = during lockdown; T2 = during partial deconfinement; T3 = during total deconfinement; T = Time; G = Group; G x T = Group x Time.
[a]Controlling for parent education. [b]Controlling for parent education, child sex and family income before COVID-19. [c]Controlling for parent education and daily screen time use.
***$p < .001$.

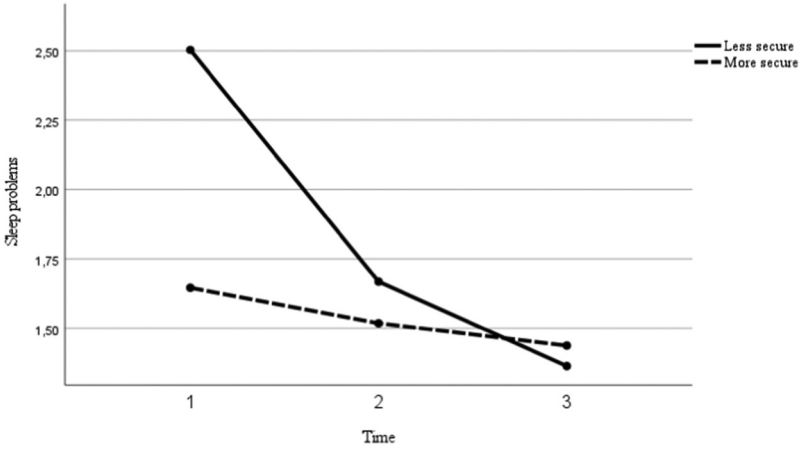

Figure 3. Change in sleep problems over time as a function of attachment security to parent. *Note.* Scores of sleep problems include parent education and daily screen time use as covariates.

Analyses including only mothers and one child from the same family

All analyses were reran including only families for which the mother was the respondent ($N = 121$). Findings followed the same pattern as with the full sample. Analyses were also reran by including only one child in families for which several children participated in the study ($N = 135$). The child whose assigned number was first, as in Dubois-Comtois et al. (2021), was selected. Findings followed the same pattern as with the full sample.

Discussion

The purpose of this study was to investigate the evolution of child maladaptation (internalizing, externalizing, and sleep problems) over the course of the first six months of the COVID-19 pandemic as a function of the parent-child relationship quality (conflict, closeness and attachment security) assessed during the first lockdown of 2020. During lockdown, parent-child conflict was moderately related to parent-child closeness and attachment security, while the association between the two latter variables was significant but small. Hence, although these dimensions are related, they capture different aspects of the parent-child relationship in middle childhood that need to be considered in order to better untangle their specific role in child adjustment (Russell et al., 2002). Overall, our results showed that child internalizing and externalizing problems decreased as the COVID-19 restrictions were loosened. They also revealed that the quality of the parent-child relationship was significantly associated with child adjustment in the first six months of the pandemic and acted as a protective factor that contributed to a better and more rapid adjustment to the pandemic, particularly in the case of externalizing and sleep problems. Thus, our results highlight the important role played by attachment security and parent-child conflict and closeness in school-age children's ability to adapt to a pandemic in particular, but also more broadly to any major crisis that generate stress, turmoil and uncertainty. They support attachment theory and public health policies that focus on strengthening parent-child relationships.

Change in externalizing problems as a function of parent-child relationship quality

As expected, and in line with other findings (Borbás et al., 2021; Essler et al., 2021), study results showed that children's externalizing problems decreased over the course of the pandemic as restrictive measures were relaxed. Changes were observed between lockdown and deconfinement but not between partial and total deconfinement, suggesting that the onset of a return to normalcy was sufficient to mitigate the effects of the lockdown and set children on a recovery road. An increase in child externalizing problems during the pandemic has been significantly related to a more unpredictable home environment during lockdown characterized by the relative absence of family routines, even after controlling for child and family sociodemographic factors and maternal depressive symptoms and perceived stress (Glynn et al., 2021). Thus, beyond the ability to adapt to change, these results suggest that a return to predictable routines and activities, reminding children of normalcy, reduces impulsive, oppositional and aggressive behaviors, potentially by making children feel more connected and secure.

Results of our study showed that children who experienced more conflict and less closeness in the relationship with their parents during lockdown had more externalizing problems throughout the first months of the pandemic. These results were similar to those of others showing that conflict and closeness in the parent-child relationship during lockdown were associated with externalizing problems both concurrently (Bate et al., 2021; Dubois-Comtois et al., 2021; Lionetti et al., 2022) and longitudinally (Horton et al., 2022). Our results extend previous knowledge by showing that the decrease in externalizing problems over time was modulated by parent-child conflict during lockdown. Children with less parent-child conflict had a decrease in

externalizing problems but not between partial and total deconfinement. In comparison, children in the high-conflict group experienced a decrease in externalizing problems at each measurement point, although their level of problems remained higher than those in the low-conflict group throughout. We can hypothesize that all children were affected by the pandemic and the changes in the family routine during lockdown, but those who had less conflict in the parent-child relationship were able to more quickly and effectively adapt to the crisis. Conversely, children who experienced a more conflictual parent-child relationship also adapted to the pandemic context but more slowly and less effectively. Because pre-COVID-19 data were not available in the current study, it is not possible to know if both groups returned to a level similar to what was observed before the pandemic.

Change in internalizing problems as a function of parent-child relationship quality

Similar to results obtained with externalizing problems, we observed a decrease in internalizing problems between lockdown and the two deconfinement time points, but not between partial and total deconfinement. Perhaps, the return to some normalcy but also the greater access to social and physical activities during partial deconfinement could explain this result. Indeed, a study showed a decrease in physical activity during lockdown that was associated with more internalizing problems in preschool children (Alonso-Martínez et al., 2021). Considering that outdoor physical individual and team activities were allowed again during partial deconfinement, it may explain the absence of a decrease in internalizing problems afterwards. Alternatively, the total deconfinement time point in our study corresponds to the beginning of the school year, which may have limited potential decrease in internalizing problems due to the stress related to going back to school. Other studies have found a slight increase in internalizing problems following school reopening in the fall of 2020 (Ravens-Sieberer et al., 2023; Xie et al., 2022). It is also important to note that the second wave of COVID-19 had already started during our third measurement time, which could also explain why internalizing problems did not decrease between partial and total deconfinements.

Children who were more securely attached to their parents and those who experienced less parent-child conflict during lockdown had lower levels of internalizing problems throughout the first months of the pandemic. These results are in line with the literature showing a protective effect of adolescents' attachment security before and at the beginning of the pandemic against internalizing problems during the COVID-19 crisis (Coulombe & Yates, 2022; Janssens et al., 2021; Laurier et al., 2021). In middle childhood, attachment security to parents has been associated with greater emotional awareness that has, in turn, been associated with lower levels of anxiety (Brumariu et al., 2012). Hence, during the pandemic not only did more secure children have parents who were more available and caring, but they most certainly also had parents who were better at helping them understand and cope with complex emotions, which may have contributed to lower levels of internalizing symptoms despite the ambient uncertainty generated by the COVID-19 pandemic. Considering that less attachment security was associated with more parent-child conflict, it is not surprising that children exposed to more conflict during lockdown had more internalizing problems in the first months of the pandemic. Repeated conflicts with the parent

may direct child attention to detect threats in the environment, and therefore increase the risk of internalizing problems (Briggs-Gowan et al., 2015; Gulley et al., 2014). Having parents who are able to regulate their own emotional reactions and help the child elaborate on his/her frustrations and anxieties with the aim to reduce conflict in the relationship during stressful times represents an important protective factor, which facilitates the child's adaptation to a stressful period of potential threat and uncertainty, such as the COVID-19 pandemic.

Change in sleep problems as a function of parent-child relationship quality

Overall, sleep problems did not change over time, contrary to our hypothesis. The number of studies assessing change in children's sleep at different times during the pandemic are limited and results are mixed. Some studies have found more sleep habit disturbances in the fall of 2020 than in the spring of 2020 (Finkel et al., 2023; Navarro-Soria et al., 2023), whereas others have found fewer disturbances after the lockdown compared to the acute phase of the confinement (Li et al., 2021; Markovic et al., 2021). In a study conducted in multiple countries with various levels of restrictions, an increase in sleep disturbances was observed in Italy where the most restrictive and longest measures were in effect in comparison to Spain and Portugal where no significant change was observed in the evolution of sleep problems over time after the lockdown (Orgilés et al., 2021). These last results are similar to those found in the current study and suggest that the evolution of the pandemic restrictions over time did not affect child sleep as unequivocally as other mental health symptoms. As found in previous studies (Richter et al., 2022), screen time use by children during lockdown was a factor related to sleep problems.

In our study, children with greater attachment security to parents during lockdown had fewer sleep problems and maintained this low level throughout the first months of the pandemic. Conversely, children in the less secure attachment group had more sleep problems during lockdown than children in the more secure group and they showed a decrease in sleep problems in the two following assessments, reaching levels similar to those observed in the more secure attachment group. Our results highlight the protective role of attachment security on sleep problems in middle childhood and suggest that secure children felt comfortable enough with parents' care to sleep well despite the uncertainty caused by the onset of the pandemic. These results extend prior work on the association between attachment security to parents (either as a secure base or a safe haven) and sleep quality during this developmental period (Keller & El-Sheikh, 2011; Perpétuo et al., 2023). Considering that child sleep quality mediates the association between attachment security and well-being (Perpétuo et al., 2023), the most secure children in our sample showed better sleep, which in turn, could have fostered a greater overall well-being during this time of crisis. As for children with less secure attachment, our results showed that their sleep problems diminished once a return to normalcy was underway. Finally, similar to results found with internalizing and externalizing problems, children who had more conflicts with their parents during lockdown experienced more sleep problems throughout the first months of the pandemic, again showing the important role of the parent-child relationship, and in particular parent-child conflicts, in child maladaptation.

Limitations and future directions

A limitation of this study is the lack of pre-COVID data, which does not allow for a comparison of internalizing, externalizing, and sleep problems during COVID-19 with prepandemic levels. In addition, it would be relevant to follow these children over a longer period, in order to assess the evolution of maladaptation beyond the first six months of the pandemic. Although our results suggest that children are resilient overall, it is unclear how children's adjustment evolves over time in the following waves of COVID-19 and beyond the pandemic. Given that the restrictive measures put in place have never been so intense thereafter, results of the current study cannot be generalized to subsequent waves of the pandemic. Although the use of parent- and child-reports was a strength of the current study, in some cases analyses conducted with the same informant may have inflated the associations that were found. The use of a well-validated self-report measure of attachment during the lockdown was an effective strategy to assess attachment. However, such an instrument is not equivalent to behavioral, interview or representational attachment measures, as it only captures conscious processing of attachment information (Steele, 2015). Therefore, one cannot rule out the possibility that the instrument only captured children who were willing and/or able to disclose how they felt in their attachment relationships or those who were aware of their attachment securities or insecurities. Moreover, the parent-child relationship quality was only assessed at baseline so we do not know if it changed over time. In addition, data on children's engagement in mental health services at the time the study was conducted are not available. In Quebec, children did not have access to mental health services during the lockdown; these services were accessible again during deconfinement but with some adaptations (e.g. mandatory masks and social distancing, telehealth). Considering the low-risk nature of our sample, most children probably did not have prior access to those services. Similarly, individual data on families' activities during summer (including day camp) are not available. However, during the months of June and August, 2020, day camps were offered but with smaller groups (no more than 10 children for those aged 9 years and older), which significantly reduced availability, and sleepover summer camps were prohibited. The access to such activities was therefore limited. Finally, the lack of diversity in the sample limits the generalizability of our findings to populations different from the current sample. For instance, the participants were recruited from various areas within the province of Quebec, Canada – a region significantly impacted by COVID-19 during the first wave of the pandemic and where stringent sanitary measures were implemented. Therefore, the results of our study may not be generalizable to other geographical regions where the pandemic manifested differently (e.g. lower numbers of cases and deaths, and limited sanitary measures). Moreover, most families in our study were middle-class, two-parent households, which likely limited the presence of preexisting stressors prior to the pandemic. Children in families with lower SES or single parent households might have reacted differently in the initial months of the pandemic, and the role of the parent-child relationship under these most stressful situations may have been even more critical.

From a developmental psychopathology perspective, research on particularly stressful contexts of adversity, such as the COVID-19 pandemic, is key to uncovering the developmental processes underlying children's adjustment. The results of

our study, combined with those of others, contribute to advancing this knowledge. They showed that internalizing and externalizing problems decreased after the first confinement (when restrictions were loosened and family routines resumed), which suggests that children do adapt in a resilient way in the face of a stressful event. Moreover, they show that children who experienced difficulties in their relationship with their parents during lockdown were particularly at risk of presenting externalizing and internalizing problems, which persisted beyond the lockdown. As for sleep, although children who were less secure in their attachment relationships experienced more problems during lockdown, sleep problems quickly resorbed once deconfinement began. These results highlight the fundamental role played by the parent-child relationship. Overall, our results show that conflicts and attachment security are the two relationship dimensions most strongly related to child adjustment over time during the pandemic. Parent-child conflict was associated with all three adjustment constructs (externalizing, internalizing and sleep problems), while attachment security was related to internalizing and sleep problems. Parent-child closeness was only related to differences in externalizing problems. The capacity of children and parents to get along and resolve their conflicts during the lockdown provides children with a family environment that represents a sanctuary in a context of fear and uncertainty. Furthermore, having the opportunity to rely on parents who serve as sources of psychological security helps manage negative emotions in such stressful situations. Thus, both of these dimensions of the parent-child relationship are particularly relevant to assess in middle childhood.

During the pandemic, public health recommendations emphasized the importance of routines and finding ways to connect with relatives and friends outside the home. While essential, these messages may have overlooked the major role played by the parent-child relationship during lockdown and the need to better support positive parent-child interactions, not only for younger children, but also for older ones. Providing the general population with strategies and services that help reduce parent-child conflict and increase closeness and attachment security should be a public health priority in highly stressful times, especially when families are confined together. Offering services to families was a challenge at the beginning of the pandemic but online parent-child attachment-based interventions developed during the COVID-19 pandemic proved to be effective and could be used in the future when direct access to families is difficult (Bao & Moretti, 2023; van Ijzendoorn et al., 2023). Other measures would also need to be put in place in order to support parents and children in these contexts. For instance, services (e.g. mental health, community, and daycare) need to remain open even during lockdown, and parents need to seek help as soon as they or their child are experiencing difficulties. Pre-existing vulnerabilities (e.g. low income, adversity and previous dysfunctions) add to the stress caused by the pandemic and represent an additional burden on families who then struggle to adapt (Prime et al., 2020). Public policies should better support families at risk, in particular by reducing poverty and marginalization, and by providing the necessary services to families in need.

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