COVID-19 and Children's Mental Health: Implications for Pandemic Recovery

A Research Report

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Christine Schwartz
Jen Barican
Donna Yung
Daphne Gray-Grant
Charlotte Waddell

Children's Health Policy Centre | SFU FACULTY OF HEALTH SCIENCES

At the Children's Health Policy Centre, we acknowledge our privilege in being located on the ancestral lands of the xwməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), Səl̓ilwətaɬ (Tsleil-Waututh), q̓ic̓əy̓ (Katzie) and kwikwəƛəm (Kwikwetlem) Nations. We understand and commit to the ongoing work of reconciliation that is required to honour all Indigenous Peoples.

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Children's Health Policy Centre

Faculty of Health Sciences, Simon Fraser University
2435 – 515 West Hastings Street, Vancouver, BC V6B 5K3
childhealthpolicy.ca

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Executive Summary

The global COVID-19 pandemic and its associated public health restrictions caused profound losses for children. Among these losses, declines in mental health have emerged as a central concern. We therefore conducted a systematic review of the best available studies examining COVID-19's impact on children's mental health. Our overarching aim was to assist policy-makers in supporting all children as society moves toward recovery.

Eight studies met our inclusion criteria. Although none were from Canada, all were conducted in high-income jurisdictions, including the United Kingdom, the Netherlands, Israel, Iceland, Norway and the United States. Seven of eight studies found that children's mental health suffered during the pandemic.

Three studies assessed *clinically meaningful* concerns. These studies found that significantly more children likely met criteria for a mental disorder or experienced clinically significant anxiety or serious emotional difficulties during the pandemic compared to before. Across these three studies, increases were substantial — ranging from 48.1% to 94.2%.

Children's mental health *symptoms* also changed during the pandemic, albeit with different patterns for different conditions. Multiple studies found that anxiety and depressive symptoms increased. Increases in emotional problems, mental distress and anger, and decreases in mental well-being were each reported in one study. Nevertheless, for most children these changes were *not* at a level that caused clinically significant distress. In contrast, behaviour problems improved according to one study but were unchanged according to another. Substance-related outcomes varied as well, with nicotine and cannabis use and alcohol intoxication showing significant declines in some studies but no change in others. Child well-being measures varied even more, with inconsistent outcomes for measures of life satisfaction and interpersonal relationships.

Beyond increased mental health concerns, some children experienced additional challenges during the pandemic. Those from families facing socio-economic disadvantage tended to have poorer mental health outcomes. As well, children had more mental health difficulties when they knew someone who had experienced COVID-19 and when they had fewer supports and less consistent daily routines.

Our systematic review suggests that many more children have needed treatment for mental health conditions — particularly anxiety and depression — during the pandemic. This situation arose against a backdrop of stark pre-existing service shortfalls, with recent international estimates (including data from Ontario, Canada) suggesting that only 44.2% of children with mental disorders were receiving *any* services for these concerns before COVID-19. Given the considerable challenges children faced during the pandemic — and continue to face — it is imperative to adequately address the needs now. BC should therefore make additional investments in children's mental health, to offset future health care and related social costs and to meet children's needs. Collectively, our current and future well-being depends on recognizing and addressing children's rights to social and emotional well-being.

1. Background

1.1 COVID-19's continuing impact and children's mental health

The global COVID-19 pandemic and its associated public health restrictions upended human lives in unprecedented ways. The pandemic caused illness and death for millions and altered socio-economic circumstances for many, including children and families in British Columbia (BC).[1–2] While children were not the immediate face of the pandemic, they have been profoundly affected by it.[3] And now, attention is rightfully being paid to the lasting impact of the pandemic — particularly for children.[3–4] (We define "children" as all those aged 18 years and younger.)

Many children have suffered extraordinary losses due to COVID-19, including deaths of parents and caregivers.[5–6] The pandemic's impact has also been markedly unequal, causing greater harms for children coping with pre-existing socio-economic disadvantage or discrimination on the basis of race.[7–10] As well, the pandemic has resulted in growing and persistent challenges regarding determinants of child health, including family socio-economic inequities, parental health problems, school interruptions, and access to health and social services.[11–13]

While many aspects of children's development have been affected by the pandemic and its sequelae, mental health has emerged as a central concern.[14–15] Defined as social and emotional well-being, mental health is crucial to every aspect of children's flourishing.[16] Yet even before the pandemic, the prevalence of childhood mental disorders was concerning. Estimates based on high-quality epidemiological studies conducted in 11 high-income countries, including Canada, have suggested that at any given time, 12.7% of children are likely experiencing one or more of the most common mental disorders.[17–18] This translates to approximately 117,700 BC children being affected at any given time.[19]

Adding to these challenges, mental disorders typically start in childhood and persist, with lifelong repercussions if they are not prevented or treated early.[20] Effective prevention and treatment interventions have been identified for most of the common childhood mental disorders.[21] Yet the epidemiological studies noted above also document critical pre-pandemic service deficits, showing that only 44.2% of children with mental disorders received *any* services for these conditions.[17] These already unacceptable prevalence rates and service shortfalls will likely have worsened as a result of COVID-19 and its myriad attendant harms.[22]

1.2 Why a new systematic review?

Researchers have conducted studies examining the impact of COVID-19 on children's mental health, providing the first step in understanding how to better support young people. Building on data from these studies, extant systematic reviews have provided estimates of burden by combining data from many studies.[23–50] Yet to best assist policy-makers in their decision-making on children's mental health, it is imperative that systematic reviews focus on high-quality research evidence. Such evidence includes studies conducted with representative samples of young people aged 18 years and younger using robust measures at two or more time points, including both before and during the pandemic. To our knowledge, no extant reviews have included all these criteria. We therefore conducted a new systematic review applying these stringent criteria to provide a more accurate picture of the pandemic's impact on children's mental health.

1.3 Goals of this systematic review

To inform policy-making, our goal was to identify and summarize high-quality studies examining the impact of COVID-19 and the associated public health restrictions on children's mental health. Our overarching aim was to assist policy-makers in supporting all young people in BC, and in Canada, as the impact of the pandemic continues and as society moves toward recovery.

I call my friends every day. It's so hard.

We'd be out every day, but we can't now.

I'm out socializing, but we would have had a sleepover.

I'm bored and fed up. I've lost my social life.[51]

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2. Methods

We conducted a systematic review examining the impact of COVID-19 on children's mental health using methods adapted from the *Cochrane Collaboration*.[52] We sought rigorous studies that measured the same quantitative mental health variables both before and during the pandemic in children aged 18 years or younger (or if young adults were included, the majority of the sample was aged 18 years or younger). We also required studies to use representative samples to ensure that findings could be applied to the general population of children. (Studies that use non-representative convenience samples are prone to substantial bias, including the risk of excluding children with the highest mental health needs.)[53] As well, we required that researchers determine whether any mental health differences before and during the pandemic were statistically significant to ensure that changes were not simply due to chance. These standards enabled us to provide the best available research evidence to inform policy-making.

Our searches yielded 7,723 potentially relevant articles. From these, we identified 2,889 relevant abstracts. After screening, we retrieved and assessed 459 articles. Following these steps, we identified eight studies that met all our inclusion criteria. We then extracted and summarized child mental health data for all eight, including any information provided on pandemic restrictions during data collection. At each stage, two authors independently conducted the assessments and verified data extraction and interpretations; any differences were resolved by consensus involving the larger team. Where available, we noted the magnitudes of any statistically significant differences, also known as effect sizes. (The Appendix provides more information on our inclusion criteria and search processes and also explains several research terms.)

We definitely noticed that students are behind…

So we are working hard to try to fill those gaps…

In my personal and professional opinion,

it's going to be several years for us to overcome this.[54]

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3. Findings

3.1 Overview

The eight accepted studies provided data from seven high-income jurisdictions – describing more than 115,000 young people.[55–63] (No Canadian studies met our criteria.) These studies captured children's experiences with both mental distress and well-being, including anxiety, depressive, substance use and behaviour symptoms as well as relationships and life satisfaction. All the studies provided at least some information on pandemic-related public health measures affecting children, such as school closures. Table 1 below summarizes the eight studies.

Table 1. Accepted Studies

Location	Data collection periods		Ages (years)	Sample size*	Study type†
	Before pandemic	During pandemic			
England [55–56]	Start date not reported to October 2017	July 2020	5–16‡	2,704‡	Repeated cross-sectional
		February to March 2021	6–16§	2,603§	
Netherlands [57]	December 2017 to July 2018	April to May 2020	8–18	844	Repeated cross-sectional
Wales [58]	February to June 2019	April to July 2021	10–11	1,863	Repeated cross-sectional
United Kingdom [59]	Start date not reported to February 2020	July 2020	10–16**	886	Longitudinal prospective cohort
Israel [60]	September 2019	May 2020	11–17**	1,537	Longitudinal prospective cohort
Iceland [61]	February or October 2016 and February or October 2018	September to November 2020	13–18	17,475	Repeated cross-sectional
Norway [62]	Annually from spring 2014 to March 2020	January to March 2021	13–18	86,597	Repeated cross-sectional
United States [63]	February to March 2020	July to August 2020	18–20**	582	Longitudinal prospective cohort

* Sample sizes reflect those during the pandemic data collection.

† Repeated cross-sectional studies compared variables in similar groups of children over time while longitudinal prospective cohort studies compared variables in the same group of children over time.

‡ Ages and sample size reflect first of two data collection periods during the pandemic (i.e., July 2020).

§ Ages and sample size reflect second of two data collection periods during the pandemic (i.e., February to March 2021).

** Ages reflect those during the pandemic data collection period. (Despite including young people up to age 20, the study met inclusion criteria because the majority of participants were age 18.)

3.2 England

During 2020 pandemic data collection, 47.0% of children were not attending school due to closures while 16.1% were not attending despite their schools having reopened.[55] Yet 30.0% of children had returned to school, at least part time, and 6.8% had attended throughout the pandemic because they were deemed vulnerable or their parent(s) or caregiver(s) were essential workers. Parents' work circumstances also changed during the pandemic, with 46.7% working from home more often, 20.5% working more hours, and 28.7% being furloughed or receiving special government funding for the self-employed. As well, 8.5% of children lived in households that fell behind in bill payments and 2.4% lived in families that struggled to afford food or used food banks.[55]

The 2020 study assessed one mental health variable: the proportion of five- to 16-year-olds who "probably" had a mental disorder.[55] This designation was based on children exceeding the 95th percentile on a symptom measure assessing emotional, behavioural and hyperactivity/inattention concerns, with at least one symptom having considerable impact on functioning. The proportion of children with a probable mental disorder rose significantly — from 10.8% in 2017 to 16.0% in 2020.[55]

During 2021 pandemic data collection, family circumstances were still being similarly affected.[56] These altered circumstances included 45.2% of parents working from home more often and 22.9% working more hours, but only 20.4% being furloughed or receiving special government funding for the self-employed. At this time point too, 24.8% of parents reported reduced household incomes, which contributed to 7.9% of children living in households that had recently fallen behind in bill payments and 4.1% living in families that struggled to afford food or used food banks. As well, 4.7% of children had tested positive or had been diagnosed with COVID-19.[56]

The 2021 study also assessed the proportion of children who "probably" had a mental disorder.[56] (Results were compared to six- to 16-year-olds only from 2017 because five-year-olds were not included in 2021.) This proportion had risen further — from 11.6% in 2017 to 17.4% in 2021.[56]

3.3 Netherlands

During 2020 pandemic data collection, schools were closed other than for children whose parents were deemed essential workers, resulting in only 5.5% of children attending.[57] As well, for 26.2% of children, parents had experienced reduced working hours, income loss or job loss. While children still rated the atmosphere in their homes as being pleasant, their ratings dropped slightly. Social distancing rules also limited children's ability to interact with people outside the home. In fact, about 90% reported that pandemic lockdown had a negative impact on their daily lives, noting concerns such as missing contact with friends and schools. For 23.7% of children, relatives or family friends had been infected with COVID-19, adding to their stresses.[57]

This study assessed mental health variables in eight- to 18-year-olds, including challenges with anxiety and depressive symptoms as well as anger.[57] Anxiety measures included the proportion of children experiencing

severe symptoms (with scores at least 1.5 standard deviations above the mean) as well as average anxiety scores. The proportion of children experiencing severe anxiety rose significantly — from 8.6% in 2017-18 to 16.7% in 2020. In other words, children had nearly double the risk of experiencing severe anxiety during the pandemic compared to before (relative risk = 1.95). Average anxiety scores also rose significantly, with a medium effect size (η^2 = 0.12). Still, average scores were in the typical range both before and during the pandemic.[57]

In contrast, the proportion of children experiencing severe depressive symptoms was higher *before* the pandemic (8.2%) than during it (7.1%), but the difference was not statistically significant.[57] Average depression scores, however, rose significantly, albeit with a small effect size (η^2 = 0.05). Importantly, these scores were in the typical range both before and during the pandemic. Similarly, the proportion of children experiencing severe anger was higher *before* the pandemic (5.5%) than during it (3.7%), with the difference not being statistically significant. Average anger scores, however, were significantly higher during the pandemic compared to previously, again with a small effect size (η^2 = 0.02), and with average scores falling within the typical range both before and during the pandemic for this measure too.[57]

This study also measured well-being variables pertaining to relationships.[57] The proportion of children experiencing severe peer relationship problems was identical before and during the pandemic (1.9%).[57] Challenges with peer relationships, however, significantly increased during the pandemic, albeit with a small effect size (η^2 = 0.02) and with average scores reflecting positive peer relationships overall.[57]

3.4 Wales

During 2021 pandemic data collection, schools had reopened after two closures lasting several months. However, 10- and 11-year-old study participants were still experiencing some ongoing social distancing restrictions.[58] The two mental health measures involved the percentage of children with scores falling in the "borderline" or "potentially clinical significant" range for emotional problems (such as feeling unhappy and lonely) and behaviour problems (such as losing one's temper and breaking things on purpose). The proportion with emotional-problem scores in the borderline or potentially clinically significant ranges rose significantly — from 17.5% in 2019 to 28.0% in 2021. This meant that children had 65% higher odds of such difficulties during the pandemic compared to before (odds ratio [OR] = 1.65). In contrast, no significant differences were found in the proportion of children experiencing substantial behaviour challenges, with 13.0% having these problems before the pandemic and 13.3% during it.[58]

Three well-being markers were also assessed, all of which showed no significant changes between 2019 and 2021.[58] These findings included 68.3% children reporting high life satisfaction in 2019 versus 64.0% in 2021. (High life satisfaction was defined as a score of eight or higher on a scale with 10 defined as "best possible life.") As well, the following ratings remained unchanged: relationships with teachers (e.g., feeling that teachers cared about and accepted them) and relationships with peers (e.g., feeling that other students in their class were kind and accepting).[58]

3.5 United Kingdom

During 2020 pandemic data collection, the region was still experiencing relatively low COVID-19 infection and mortality rates.[59] Still, physical distancing rules were in place and social interactions were limited outside of immediate households. As well, at this time, 11.6% of children were living in homes with an adult who had experienced COVID-19 or its likely symptoms.

This study assessed three mental health variables in 10- to 16-year-olds.[59] Researchers found significant increases in emotional problems, significant *decreases* in behaviour problems and no significant changes in hyperactivity. Importantly, average scores for all three concerns were in the typical range both before and during the pandemic. Two well-being variables were also assessed. Children's peer relationship problems rose significantly, while prosocial behaviours decreased during the pandemic. However, average scores here were still in the typical range for both measures at both times.[59]

3.6 Israel

The 2020 pandemic data collection occurred when schools had reopened after an extended closure and after the country had recently completed a two-month national lockdown.[60] This study assessed five mental health variables in 11- to 17-year-olds.[60] Four measures showed significant worsening during the pandemic. For psychological distress and depressive and anxiety symptoms, average scores increased with medium effect sizes (η^2_p = 0.06, 0.08 and 0.13, respectively). Similarly, average scores on a measure of panic increased, albeit with a small effect size (η^2_p =.02). However, somatization symptoms — including experiences such as weakness, dizziness, nausea and chest pains — declined, with a small effect size (η^2_p = 0.01). Still, average scores for all five measures were in the typical range both before and during the pandemic.[64]

This study also measured seven well-being variables. Regarding life satisfaction and peer support, young people reported significant reductions during the pandemic. However, for both measures, effect sizes were small (η^2_p = 0.01 and 0.02) and scores still indicated well-being. For positive emotions, young people reported significant reductions during the pandemic, with a large effect size (η^2_p = 0.19), but no significant change for negative emotions.[60] In regard to activities, young people reported significantly more gaming and internet use during the pandemic but less social media use, with small effect sizes for all three (η^2_p = 0.02, 0.02 and 0.01, respectively).[60]

3.7 Iceland

The 2020 pandemic data collection occurred when the country was experiencing its largest COVID-19 wave to date.[61] Pandemic restrictions for young people, however, differed by grade. Specifically, most secondary schools were limited to online learning while schools for younger students provided in-person learning. Still, all young people were subject to physical distancing mandates, including limiting gatherings to fewer than 10 individuals.[61]

This study assessed five mental health variables in 13- to 18-year-olds.[61] Participants in 2020 reported significantly worse overall mental well-being than those in 2016 and 2018, yet with small effect sizes (Cohen's *d* ranged from 0.20 to 0.35).[61] Depressive symptom scores also rose significantly during the pandemic, with small effect sizes (*d* ranged from 0.15 to 0.41). Importantly, however, average depression scores across all time periods were in the typical range.

On the other hand, researchers found reductions in substance use during the pandemic.[61] Significantly fewer children reporting smoking cigarettes in the past month, with only 3.8% using during the pandemic compared to 8.8% in 2018 and 10.4% in 2016 (OR = 0.79). Significantly fewer children reporting vaping in the past month as well, with only 13.5% using during the pandemic compared to 27.4% in 2018 and 17.7% in 2016 (OR =0.95). And significantly fewer children reported past-month alcohol intoxication, with only 13.2% experiencing this during the pandemic compared to 19.5% in 2018 and 20.6% in 2016 (OR = 0.88). Study authors speculated that pandemic restrictions that limited social gatherings may have also resulted in less social pressure to use substances.[61]

3.8 Norway

During 2021 pandemic data collection, schools had been open for between eight and 10 months following a two-month closure.[62] National pandemic-related school policies nevertheless meant smaller class sizes and physical distancing, with some learning also taking place at home. At the time of the study, COVID-19 infection rates were lower in Norway relative to other European countries.[62]

This study assessed five mental health variables in 13- to 18-year-olds.[62] Depressive symptoms increased during the pandemic compared to pre-pandemic levels. The effect size, however, was very small (d = 0.08). In contrast, behaviour problems, including concerns such as stealing and vandalism, remained unchanged. Importantly, average symptom scores for both depression and behaviour concerns remained in the typical range at all time points. Regarding substance use, changes varied by type. Cannabis use and alcohol intoxication both significantly declined, albeit with very small effect sizes (d = 0.06 and 0.08, respectively), while cigarette smoking remained unchanged during the pandemic.[62]

This study also assessed five well-being variables.[62] Outcomes included significantly fewer children reporting expecting "to live a good and happy life" during the pandemic compared to before, with a very small effect size (d = 0.05). Still, most youth reported having positive expectations for the future, similar to past assessments (68.8% in 2021 versus between 68.8% and 74.6% in the seven previous years). As well, this study found no significant difference in the number of children reporting satisfaction in their relationships with parents and peers or reporting loneliness. In fact, most young people indicated that they were highly satisfied with these relationships.

3.9 United States

During 2020 pandemic data collection, schools were closed for summer holidays.[63] Still, all study participants were subject to social distancing policies, although public compliance with these policies varied by state. This study assessed three types of substance use by 18- to 20-year-olds.[63] (Most participants were 18 years old and therefore within the scope of this review.) Significantly fewer young people reported vaping compared to before the pandemic, with past-month use falling to 17% from 24%. But there were no significant changes for either past-month marijuana use, which was 20% during the pandemic compared to 23% previously, or for binge drinking in the past two weeks, which was 13% during the pandemic compared to 17% previously.[63]

Table 2 on the next page summarizes the child mental health outcomes from all eight studies, and Table 3 that follows summarizes well-being outcomes from the five studies that assessed these.

> I am not allowed to see or hug my grandparents.[57]

Table 2. Child Mental Health During the COVID-19 Pandemic

Location	England [55-56]	Netherlands [57]	Wales [58]	United Kingdom [59]	Israel [60]	Iceland [61]	Norway [62]	United States [63]
Mental Health – Clinically Significant Concerns								
	July 2020 ↑ probable disorder* (10.8% to 16.0%) Feb-March 2021 ↑ probable disorder* (11.6% to 17.4%)	↑ anxiety† (8.6% to 16.7%) NS depression† NS anger†	↑ emotional difficulties‡ (17.5% to 28.0%) NS behaviour‡					
Mental Health – Symptoms and Well-Being								
Anxiety		↑§			↑§			
Panic					↑§			
Depression		↑§			↑§	↑§	↑**	
Emotional problems				↑§				
Mental well-being						↓		
Mental distress					↑§			
Anger		↑§						
Behaviour problems				↓§			NS**	
Hyperactivity				NS§				
Somatization					↓§			
Cigarette smoking						↓	NS	
Vaping						↓		↓
Alcohol intoxication						↓	↓	NS
Cannabis use							↓	NS

Red font indicates statistically significant *deterioration* between pre-pandemic and pandemic assessments.

Blue font indicates no statistically significant (NS) change between pre-pandemic and pandemic assessments.

Green font indicates statistically significant *improvement* between pre-pandemic and pandemic assessments.

Blank cell indicates study did not assess that outcome.

* Probable disorder = emotional, behavioural or hyperactivity/inattention symptoms > 95th percentile plus at least "quite of a lot" of impact on functioning.

† Scores ≥ 1.5 standard deviations above mean.

‡ Scores = borderline and potentially clinically significant ranges.

§ Average scores in the typical range at both data collection periods.

** Data suggested average scores were *not* in the clinically significant range during any data collection period.

Table 3. Child Well-Being During the COVID-19 Pandemic

Location	Netherlands [57]	Wales [58]	United Kingdom [59]	Israel [60]	Norway [62]
Life satisfaction		NS		↓	
Positive future expectations					↓
Relationship – parents					NS
Relationships – peers		NS			NS
Relationships – peer support				↓	
Relationships – problematic peers	↑*		↑*		
Relationships – severe peer problems	NS				
Relationship – teachers		NS			
Positive emotions				↓	
Negative emotions				NS	
Loneliness					NS
Prosocial behaviours			↓*		
Gaming				↑	
Internet use				↑	
Social media use				↓	
Screen time					↑

Red font indicates statistically significant decrease in positive outcome or increase in potentially negative outcome between pre-pandemic and pandemic assessments.

Blue font indicates no statistically significant (NS) change between pre-pandemic and pandemic assessments.

Green font indicates statistically significant increase in positive outcome or decrease in negative outcome between pre-pandemic and pandemic assessments.

Blank cell means study did not assess that outcome.

* Average scores were in the typical range at both data collection periods.

3.10 Coping with added challenges

Beyond assessing mental health and well-being before and during the pandemic, several studies examined factors that created added challenges. In particular, coping with pre-existing mental health conditions and systemic barriers — including family socio-economic disadvantage — disproportionately burdened some children. As well, public policy pandemic responses, personal experiences of COVID-19, and interruptions to supports and routines created more burdens for many.

Pre-existing mental health concerns

Three studies examined how children fared during the — identifying mixed findings. The study in Israel found that children with more severe mental health symptoms before COVID-19 experienced more severe symptom increases during the pandemic as well as greater general psychological distress.[60] However, the UK study found that children with more problems before the pandemic experienced improvements, while children with relatively positive mental health previously experienced notable declines during the pandemic.[59] In explaining this outcome, study authors suggested that enhanced parent-child interactions and increased adult supervision during the pandemic may have been particularly helpful for children with pre-existing mental health concerns.[59] And the English study found that children with probable mental disorders experienced more challenges related to home learning compared with children without these disorders, struggling in particular with motivation (47.0% vs. 74.5%).[56]

Family socio-economic disadvantage

Four studies examined the relationship between family socio-economic disadvantage and children's mental health outcomes during the pandemic, consistently identifying significantly poorer outcomes for children from these families. The study in the Netherlands found that negative changes in parents' work situations were associated with more child anxiety and depressive symptoms and more anger.[57] The Norwegian study found that children who rated their family's economic situation as "mostly or always bad" in the prior two years experienced more depressive symptoms and loneliness as well as less satisfaction in their relationship with their parents, compared with those not coping with these issues.[62] The children coping with disadvantage also had smaller decreases in smoking, cannabis use and behaviour problems than those who were more advantaged. As well, when parents did not have post-secondary education, young people experienced greater declines in peer and parental relationships and greater increases in depressive symptoms and loneliness, compared with those whose parents had such education.[62]

Similarly, the UK study found that children from high-income families fared better, experiencing a smaller increase in hyperactivity symptoms than those from low-income families.[59] As well, the English study found that children with probable mental disorders were more than twice as likely to live in households that fell behind on bill payments during the pandemic, compared with those unlikely to have such disorders (for

wave 1, 16.3% vs. 6.4%; for wave 2, 12.8% vs. 6.7%).[55–56] The second wave of English data collection also found that children with probable mental disorders were more likely to live in households that could not afford to buy food or had to use food banks (9.1% vs. 2.8%). These children were also significantly less likely to have access to a laptop or tablet (87.8% vs. 96.1%), compared with those without such disorders.[56]

Public policy pandemic responses

While all the included studies described at least some pandemic policy responses in their locale, most did not examine how these responses may have affected children. One study did, however, examine the relationship between pandemic restrictions and children's substance use.[62] In Norway, researchers found that stricter municipal restrictions than those imposed nationally — namely school closures and other (unspecified) measures to reduce transmission — were associated with reduced cigarette smoking for young people.[62] Data on the impact of BC's policy responses are included in the sidebar below.

The impact of BC's policy responses

Data is also beginning to emerge on the impact of pandemic policy responses in BC. For example, there is evidence of reduced access to important services including community-based postpartum care for newborns, immunizations for children and supports intended to reduce the risk of children experiencing violence.[65]

Personal experiences of COVID-19

Two studies also specifically examined the mental health impact when children knew someone who had experienced COVID-19. The Dutch study found that children with an affected relative or family friend had more anxiety than those who did not have such experiences.[57] The UK study found that children who lived with an adult who had COVID-19 symptoms or illness were significantly more likely to experience increased peer relationship problems than those who did not have such experiences.[59]

How supports and routines helped during the pandemic

The Israeli study assessed the impact that supports and routines had on children's mental health.[60] Young people with adequate social supports — for example, having friends and family members with whom they could share their problems and whom they could count on to help them when things went wrong — were less likely to experience increases in mental health symptoms compared with those without such supports. As well, those with consistent daily routines — for example, participating in online lessons when schools were in lockdown and completing homework daily — were less likely to experience increases in mental health symptoms than those without such routines.[60]

4. Discussion

4.1 Summary of findings

Seven of the eight studies we reviewed found that children's mental health suffered during the pandemic. Three studies assessed clinically meaningful mental health concerns — finding at least one significant increase. In one study, significantly more children likely met criteria for a mental disorder during the pandemic.[55–56] In another, more children experienced clinically significant anxiety, although not depression.[57] In the third study, more children experienced serious emotional difficulties, although not behavioural difficulties.[58] And across these three studies increases were substantial, ranging from 48.1% to 94.2%.[55, 57] As well, in all three studies, children with these concerns had strongly elevated symptoms and were likely in need of treatment.

Children's experiences with mental health symptoms also changed during the pandemic, albeit not uniformly. Some types of symptoms were exacerbated, others unchanged and some even improved. With respect to those exacerbated, two studies found escalations in anxiety symptoms generally[57, 60] and one found increases in panic symptoms specifically.[60] The four studies that assessed depressive symptoms all found significant upturns.[57, 60–62] Increases in emotional problems, mental distress and anger and decreases in mental well-being were also found in one study each.[57, 59–61] Nevertheless, for all these variables children's average scores remained in the typical range during the pandemic. This means that for most children, increases were *not* at a level that caused clinically significant distress.

In contrast, children's other mental health symptoms remained unchanged or even improved during the pandemic. Behaviour problems improved according to one study[59] but were unchanged according to another.[62] Hyperactivity symptoms were found to be unchanged in one study.[59] Somatization symptoms improved in another study.[60] Substance-related outcomes also varied, with nicotine and cannabis use and alcohol intoxication showing significant declines in some studies but no change in others.[61–63]

Child well-being measures varied even more than mental health measures. One study found significant reductions in life satisfaction during the pandemic[60] while one found no changes.[58] Lowered expectations for the future were documented in another.[62] Negative emotions were unchanged but positive emotions were decreased according to one study.[60] One study also found a significant reduction in prosocial behaviours.[59] Regarding relationships, those with parents and teachers were found to be unchanged.[58, 62] However, findings regarding peers were mixed. Two studies found no changes in these relationships generally[58, 62] or in severe problems with peers.[57] In contrast, peer relationship problems significantly increased according to two studies[57, 59] while declines in peer support were documented in another.[60] Loneliness nevertheless remained unchanged.[62] As well, overall screen time increased according to one study.[62] However, another study found increases in gaming and internet use but decreases in social media use.[60]

Some children experienced added challenges during the pandemic. Findings were mixed for those with pre-existing mental health concerns. For example, one study found these children struggled more and another found improvements in their mental health during the pandemic.[59–60] Yet four studies clearly depicted poorer mental health outcomes for children from families experiencing socio-economic disadvantage.[55–57, 59, 62] Two studies also found that children had more difficulties when they knew someone who had experienced COVID-19.[57, 59] As well, one study found that children with less support and less consistent daily routines had more mental health challenges during the pandemic.[60]

She was so happy to see kids.

She did not care that they were all masked up.

She did not care that they had partitions on their desk.[54]

4.2 Strengths and limitations

Our review has several strengths. Findings are based on studies that included representative samples of children. This approach allows for findings to be generalized to the whole population of children, ensuring that no groups are excluded.[53] In contrast, convenience sampling can skew findings if certain populations are omitted — and such omissions often involve children and families coping with higher levels of socio-economic disadvantage.[66] For informing policy, it is therefore particularly important to rely on representative sampling.

As well, we required studies to collect data on children's mental health both before and during the pandemic. This approach ensured that measures during the pandemic were compared to a pre-pandemic baseline, verifying that any increases were more likely due to COVID-19 and its attendant harms. Our requirement for robust mental health measures in children is a further strength for informing policy intended to help this age group with its unique development needs — ensuring that estimates of need are as accurate as possible.[67]

Our review also has limitations. Most notably, at the time of our searches, no Canadian studies had been conducted assessing children's mental health in representative samples before and during the pandemic — including no studies involving BC children. But these data will be forthcoming in 2024, with a repeat of Statistics Canada's Canadian Health Survey for Children and Youth (CHSCY) that will include BC children.[68] BC could also use existing child mental health data sources to ensure adequate population monitoring going forward, including providing baseline data should other major events occur that may be expected to affect children's mental health.[69]

4.3 Policy and practice implications

Prepare for more children needing mental health services

Our systematic review suggests that considerably more children have needed treatments for mental health conditions — particularly anxiety and depression — during the COVID-19 pandemic. Yet any increases in demand arose against a backdrop of significant shortfalls in services. Notably, recent estimates suggest that only 44.2% of children with mental disorders were receiving *any* services for these concerns before the pandemic.[17] Canada lacks consistent information on access to publicly funded children's mental health services.[69] Still, texts and calls to the Kids Help Phone from children in BC were found to increase by 51% and 70% respectively between April and July 2020.[70] As well, data from the Ministry of Children and Family Development's Child and Youth Mental Health service, BC's main publicly funded, community-based mental health provider, found that wait times for service increased by approximately two weeks during the 2020–21 fiscal year over previous years.[71] This left the typical child waiting 68 days for services.[71] (In comparison, in May 2020, average wait time for service was 53.9 days.)[72] BC should make additional investments in children's mental health to both meet children's existing needs and offset future health care and related social costs.[73–76]

Recognize and address the pandemic's disproportionate impact on certain children

Some groups of children have experienced more adversities than others during the pandemic — and continue to do so. In particular, children from socio-economically disadvantaged families face added mental health challenges. This finding is not surprising given the well-documented adverse outcomes of socio-economic disadvantage for children, including poorer mental health.[77–78] Indigenous Peoples have also long been overrepresented among families facing socio-economic disadvantage in Canada.[79]

More can and should be done to support children from socio-economically disadvantaged families. Income-supplement and employment programs that provide financial assistance to disadvantaged families have been shown to reduce behaviour problems.[80–81] As well, providing an $81 monthly supplement to low-income pregnant First Nations mothers in Manitoba was associated with improved birth outcomes, increased child vaccination rates and better child development outcomes.[82] Additional Canadian data have shown that investments in social spending, including income supplements were associated with improved population health outcomes, including lower infant mortality, increased life expectancy and fewer days off work due to mental health concerns.[83] The pandemic and the associated recovery provide an opportunity to address socio-economic inequities that affect children's mental health. The sidebar on the next page includes more information regarding the toll of the pandemic on BC's children.

Who in BC was disproportionately affected?

The pandemic has upended the lives of many children and families in BC. This was particularly true for those experiencing challenges with substance use. From January 2021 to December 31, 2022, 65 young people aged 18 years and younger died from toxic drug exposures — more than double the 2019 rate.[84] Children with support needs also experienced added challenges during the pandemic. For example, many services for these children and their families were halted at the start of the pandemic.[12, 85]

As well, Indigenous children and families in BC and those of Asian heritage faced added hurdles due to racism. For example, Indigenous Peoples were denied entry into some local businesses,[86–87] and anti-Asian racism in BC escalated to include children being assaulted.[88] Children in government care also experienced added challenges when in-person visits with biological family members were suspended early in the pandemic.[89] As pandemic recovery continues, children who have been disproportionately affected need to receive added supports according to their needs.

Celebrate children's resiliency

Many children experienced changes in their mental health during the pandemic, according to the studies we reviewed. Typically, anxiety and depressive symptoms increased while behaviour problems and substance use decreased or remained unchanged. Reductions in behaviour problems may have occurred, in part, due to some parents being able to provide more supervision during the pandemic.[59] Possible reasons for reduced substance use may include youth having less access to substances during the pandemic as well as experiencing less pressure to use.[61, 63] Importantly, though, even when symptoms did increase, most children still functioned well — highlighting the resiliency of young people even when faced with extraordinarily stressful circumstances, particularly when they have sufficient supports.

4.4 Conclusions

COVID-19 and the public health measures designed to address it caused exceptional disruptions for children. Some suffered extraordinary losses, including the death of parents, grandparents and other loved ones. Many also faced hardships, including socio-economic disadvantage and racism. Numerous health and social services that so many children and families depended on were also disrupted.[11–13] Compounding these challenges, the vast majority of children also had to cope with school closures.

This review provides an accounting of the consequences that the COVID-19 pandemic has had on children's mental health based on the best available epidemiological studies. Overall, included studies consistently showed increases in anxiety and depressive symptoms. As well, clinically meaningful mental health concerns increased dramatically — with highest estimates suggesting a doubling of cases during the pandemic. Yet substance use and behavioural problems improved or remained unchanged according to several studies. Our findings also pointed to a differential impact, with some children — such as those from socio-economically disadvantaged families — experiencing a greater mental health toll.

These findings can inform next steps, namely making more investments in children's mental health services and addressing the social determinants of mental health. Pre-pandemic shortfalls would not likely be tolerated for other serious health conditions, such as childhood cancer, and should not be accepted for children's social and emotional problems.[90]

5. Appendices

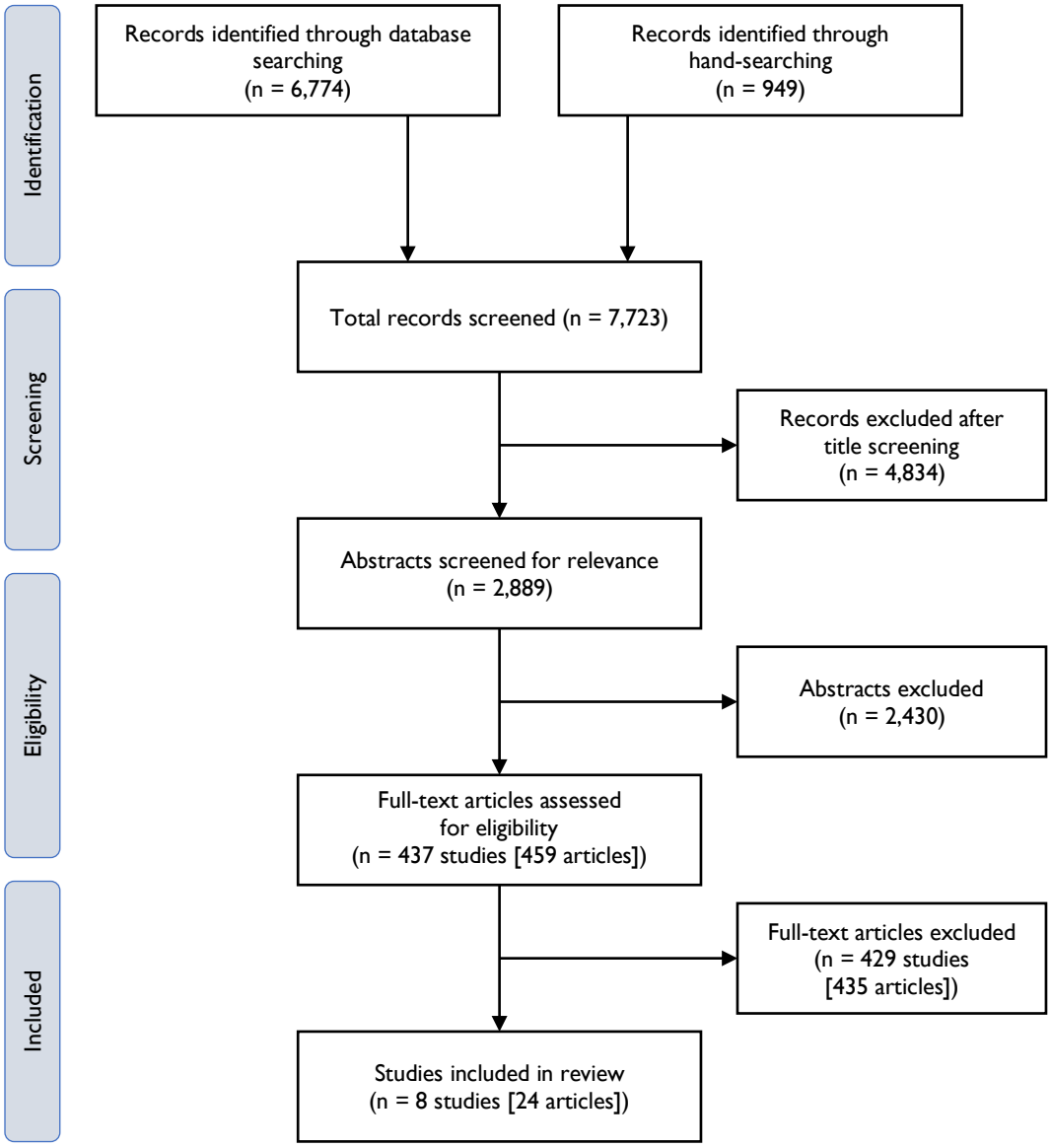
5.1 Review methods

Table A1. Study Inclusion Criteria

- Focused on children ≤18 years
- Published between January 2020 and March 2022
- Selected population was drawn from a high-income country (by World Bank standards)
- Selected sample was representative of a national or regional population*
- Surveyed all young people within the population or used probabilistic sampling to select respondents from a reliable frame†
- Provided clear descriptions of participants, study setting and methods
- Reported data included quantitative mental health measure(s) collected both prior to *and* during the COVID-19 pandemic either for the same children (i.e., longitudinal prospective cohort study) or comparable children (i.e., repeated cross-sectional study)
- Conducted analyses to determine if any differences found on mental health measure(s) across the data collection periods were statistically significant

* Regional populations were those covering/representing a large geographical area, such as a province, state or country.
† Reliable frame comprised all possible units (e.g., individuals, schools or households) within a target population.

Figure A1. Search Process for Identifying Epidemiological Studies*



* Adapted from Preferred Reporting Item for Systematic Reviews and Meta-Analyses.[91]

Table A2. Search Strategy

Databases	• CINAHL, ERIC, Medline and PsycINFO
Search Terms	• COVID-19, SARS-CoV-2 or (coronavirus or severe acute respiratory syndrome and pandemic, epidemic or outbreak); and • Mental disorders, mental health or (mental or psychological and health, illness or wellbeing)
Limits	• Peer-reviewed articles published in English between January 2020 and March 2022 • Child participants aged 18 years or younger

5.2 Research terms explained

To assess changes in children's outcomes during the pandemic, we required studies to conduct statistical analyses and identify changes that were **statistically significant.** This distinction helps provide certainty that differences in functioning occurring during the pandemic were real, rather than appearing that way due to chance. The studies included in this report used the typical convention of having p values be less than 0.05, enabling at least 95% confidence that results reflected a real change. As well, some studies determined whether the degree of change was clinically meaningful by calculating outcome **effect sizes.** The studies we reported effect sizes in various ways, namely the following:

- η^2 and η^2_p: 0.01 = small; 0.06 = medium; and 0.14 = large
- Cohen's *d*: < 0.2 = very small; 0.2–0.4 = small; 0.5–0.7 = medium; and ≥ 0.8 = large
- Odds ratio (OR) indicates the increased or reduced odds of an outcome occurring (e.g., having more depressive symptoms during the pandemic compared to prior to it).
- Relative risk indicates the increased or reduced risk of an outcome occurring (e.g., having a reduced risk of being classified in poor health during the pandemic compared to prior to it).

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