

**ADHD SYMPTOMS, INTERNALIZING SYMPTOMS, AND MINDFUL PARENTING
DURING THE COVID-19 PANDEMIC: A COHORT STUDY**

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Abstract

Increased mental health difficulties were reported in Canadian children as a result of the Covid-19 pandemic. Accordingly, the pandemic has impacted families as well. The purpose of this thesis was: 1) to examine fluctuations in children's mental health symptoms and mindful parenting across the 2020-2021 academic year; 2) to examine whether children's symptoms of inattention and hyperactivity at the beginning of the 2020-2021 academic year were associated with mindful parenting at the end of the academic year; 3) to examine whether children's depressive and anxiety symptoms at the end of the year moderated this relationship and; 4) to examine how child age and gender affected these relationships. Parents of 114 young children in a large Canadian city participated in this study in the Fall of 2020 and the Spring of 2021. Parents completed several self-report scales used to measure children's mental health symptomatology and mindfulness in parenting. While there were no significant changes in children's mental health symptoms or mindful parenting across the time points, children's symptoms of inattention and hyperactivity were significantly, negatively associated with mindful parenting across the pandemic year, and children's depressive symptoms moderated this relationship. Specifically, when children's depressive symptoms were low or average it was found that higher symptoms of inattention and hyperactivity were associated with lower levels of mindful parenting among parents of young girls. Results may inform practitioners about which families require additional support during the pandemic and beyond.

ADHD Symptoms, Internalizing Symptoms, and Mindful Parenting During the Covid-19 Pandemic: A Cohort Study

The mental health of Canadian children has been an area of growing concern for many years. In 2017, there were approximately 12,000 children and adolescents on waitlists to receive mental health services within the province of Ontario alone (Children's Mental Health Ontario [CMHO], 2020). Within the past four years this number has more than doubled, as there are currently approximately 28,000 Ontario children and youth on these waitlists with some waiting two and a half years to access services (CMHO, 2021). Compounded by the Covid-19 pandemic, it is evident that children's mental health is more important than ever before, echoing the now common-place adage that "the kids are not alright".

The Coronavirus Disease 2019 (Covid-19) was officially characterized as a global pandemic on March 11th, 2020, by the World Health Organization (WHO; 2020) and has continued to have far reaching, profound impacts on families and young children throughout the world (Fegert et al., 2020; Liu & Doan, 2020; Vasileva et al., 2021). In Canada, preventive health and safety measures have resulted in repeated school closures across the country, leading to unprecedented challenges in many domains in the lives of children and their families (Statistics Canada, 2021). Indeed, children's mental health has been impacted by the pandemic and its associated consequences (e.g., school closures, prolonged isolation), which has resulted in several Canadian organizations recently declaring a #codePINK (i.e., a national pediatric mental health crisis; Children First Canada, 2021). A recent meta-analysis of 29 studies found that the mental health of children and adolescents around the world appears to be worsening as Covid-19 continues to evolve, specifically depression and anxiety symptoms (Racine et al., 2021). Thus, while it has been quite clear from the beginning that Covid-19 is a public health crisis that affects all individuals (WHO, 2020), it is equally important to examine and acknowledge the children's mental health crisis that has ensued during the pandemic. Mounting evidence suggests that certain populations of children, such as those with ADHD symptoms have been disproportionately impacted by the pandemic and its associated stresses (Hai et al., 2021). Moreover, despite public health restrictions having lifted, many individuals are still being infected meaning that the lives of many are still deeply affected by the pandemic.

When examining the mental health of children and youth during the pandemic, it is essential to consider the family context as parents are a primary support system for their children

during this time (Moulin et al., 2021). However, Covid-19 has resulted in increased, ongoing family-level stress, whereby the increased stress of one member of the family unit likely exacerbates the stress levels of another (Liu & Doan, 2020). For instance, when younger children cannot spend time with their peers, they might become increasingly agitated or withdrawn, which may in turn increase parental stress. Prime and colleagues (2020) proposed a conceptual model suggesting that youth's adjustment to the pandemic is linked to family processes and caregiver well-being. Because children's mental health symptoms may be related to certain parenting practices, such as mindful parenting, it is important to understand how such associations have been affected by the Covid-19 pandemic.

In light of this literature, the goals of the present study are: 1) to examine changes in young children's mental health (i.e., symptoms of attention-deficit/hyperactivity disorder (ADHD), depression, and anxiety) at two timepoints in the 2020-2021 school year; 2) to examine whether children's ADHD symptoms are associated with changes in parenting practices, specifically mindful parenting, and 3) to examine whether children's internalizing symptoms affect associations between children's ADHD symptoms and mindful parenting. While research in the area of children's mental health during Covid-19 is a burgeoning field, there is a paucity of published research about how the pandemic has affected younger children over the course of the pandemic to date. Thus, the emphasis of this study will be on younger children's mental health (i.e., those aged 4-7 years) and spanning one school year. It is hoped that these findings will provide insight into children's mental health and family well-being during the Covid-19 pandemic and offer information about which families require additional support during this time. This study might also shed light on which families need further support in general, particularly when taking into consideration common children's mental health symptoms.

Theoretical Framework

Bioecological Model

Cobham and colleagues (2016) articulated the importance of employing an ecological systems lens, with particular focus on the family unit, when studying children's mental health symptoms after a disaster. While Cobham's research review focused primarily on natural disasters and terrorism, this model can be extended to the current Covid-19 pandemic due to the extensive societal impacts as a result of the pandemic. Since disasters affect the family system as a whole, not just its individual members, taking such a family-wide perspective is critical.

Ecological systems theory was originally put forth by Bronfenbrenner (1977), whereby he postulated that to understand a child's development, one needs to understand the different levels of the ecosystem in which the child is nested (i.e., the various environments with diverse interactions with many individuals). This theory was later adapted and renamed the bioecological model, which captures both proximal processes (i.e., the bidirectional relationships that exist between a developing human and the individuals/objects in their immediate external world) and the ways in which the developing humans, external environments, the time period and changes throughout this period, as well as the developmental outcomes influence the proximal processes and overall development (Bronfenbrenner & Evans, 2000). It is quite clear during an unprecedented time, such as the pandemic, there would be many external events and developmental outcomes that would influence the proximal processes and thus children's mental health and parenting variables.

Specific to young children, Egger and Angold (2006) posited that many behavioural concerns are not ontogenetic to the individual child; rather concerns frequently arise from the dynamics between children, parents, and the broader contexts in which they live. Lin and colleagues (2021) discussed how educational, familial, physical, and community-based factors have all contributed to children's mental health during Covid-19. Such ecological frameworks are especially relevant in the context of the pandemic due to its marked impacts on the social lives of young children (Fegert et al., 2020). For instance, the unprecedented nature of Covid-19 and its associated challenges have led to changes on the microsystem level, such as family dynamics/functioning, schooling, and extracurricular activities. Such factors may influence children's development, including mental health, just as the child can uniquely influence these domains as well. Thus, using ecological systems theory as a theoretical framework, this study endeavours to understand changes in young children's mental health symptomology and parenting during the Covid-19 pandemic.

Background Literature

Children's Mental Health Before the Emergence of Covid-19

A recent meta-analysis by Charach and colleagues (2020) found that in young children seeking health care services, approximately one in six present with mental health concerns. Pre-Covid-19, a meta-analysis that examined global prevalence rates found that common mental health problems experienced by children and adolescents are anxiety,

inattention/hyperactivity/impulsivity, and to a lesser degree, mood concerns (Polanczyk et al., 2015). In light of this research, this study will examine children's ADHD, anxiety, and depressive symptoms.

Children's ADHD Symptoms

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common disorder among young children (e.g., Fulton et al., 2009; Lavigne et al., 2009) marked by "...a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development..." (American Psychiatric Association [APA], 2013, p. 59). Inattention is characterized by difficulties staying on task, maintaining focus, being organized, and listening to those who are speaking directly to them as well as being prone to forgetfulness and reluctant to participate in activities that demand one's attention (APA, 2013). Hyperactivity/impulsivity consists of moving around often (e.g., fidgeting, leaving one's seat), climbing objects/running during inappropriate times, being noisy during tasks/activities, speaking often, interrupting/being unable to wait one's turn, and constantly being "on the go." Symptoms of ADHD are required to manifest before 12 years of age and tend to be more common in boys. Moreover, symptoms must be displayed in more than one setting (e.g., in the classroom and at home) and must impact daily functioning (APA, 2013). Typically, it has been found that parents of children with ADHD experience enhanced distress (Evans et al., 2020; Modesto-Lowe et al., 2008; Whalen et al., 2011) as well as interactions with their children that are marked by the presence of control and negativity (Johnston & Mash, 2001).

While frequently conceptualized as a diagnostic category, Spira and Fischel (2005) found that ADHD symptoms among young children may be best understood using a dimensional versus a categorical approach. The main reason for this is that there is a desire not to assign diagnostic labels to behaviours that may be short-term and typical to a child's developmental stage. Furthermore, ADHD symptoms are hard to differentiate from typical child behaviours before the age of four years (APA, 2013). Marcus and Barry (2011) found that the symptoms of ADHD are better understood by a latent variable that is dimensional in nature as opposed to one that is categorical. Further, pre-school aged children with subclinical levels of ADHD are at risk to experience long-term behavioural concerns, as well as low levels of academic achievement (Spira & Fischel, 2005). Given that ADHD is best conceptualized dimensionally and young children with subclinical levels of symptoms also experience long-term negative effects, it follows that

children's ADHD symptoms should be studied dimensionally in the context of the Covid-19 pandemic.

Although ADHD is conceptualized in the DSM-V as a neurodevelopmental disorder (APA, 2013), research has found that transactional patterns of cumulative risk, whereby being exposed to multiple childhood adversities/stressors, is a risk factor for the development of ADHD symptoms in adolescence and/or emerging adulthood in both community (Humphreys et al., 2019) and clinical samples (Björkenstam et al., 2018). For example, among preschool children (i.e., aged 3-6 years) who were exposed to Hurricane Katrina, 29.4% of children with ADHD developed this diagnosis *after* the hurricane, as opposed to beforehand (Scheeringa & Zeanah, 2008). Furthermore, ADHD symptoms in girls were higher among those who stayed in New Orleans in contrast to those moved and consequently did not have as much exposure to the aftermath of the event (Scheeringa & Zeanah, 2008). This finding holds particular relevance in the context of Covid-19 as it was not possible for individuals to avoid this event and its subsequent adverse impacts. Going forward, it is equally important to examine children's depression and anxiety symptoms during this time, particularly since internalizing disorders are common in this age group and frequently co-occur with ADHD symptoms (APA, 2013).

Children's Internalizing Symptoms

Internalizing symptoms are considered "inner-directed" and consist of anxious and depressed affect (Holland et al., 2017). Although younger children might not meet all the diagnostic criteria for an anxiety disorder, they may still manifest impairing symptoms of anxiety in their day-to-day lives (Holland et al., 2017). Like ADHD symptoms, younger children's internalizing concerns have commonly been assessed on a continuum (Egger & Angold, 2006). When using a dimensional approach in understanding internalizing symptoms, it is important to note that concerns on the extreme ends of the spectrum may not indicate clinical diagnoses, but rather are usually representative of risk factors for later mental health concerns (Egger & Angold, 2006).

Depressive Symptoms. According to the DSM-5, depressive disorders entail "...the presence of sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function" (APA, 2013, p. 155). Clinical levels of low mood are prevalent in 0.1%-2.1% of young children aged 2-5 years (Bufferd et al., 2011; Egger & Angold, 2006; Lavigne et al., 2009; Wichstrøm et al., 2012) and often manifest as

irritable and grumpy behaviour, as opposed to sadness (APA, 2013). Young children may also experience many of the same symptoms as adults, such as a lack of enjoyment and interest in tasks/activities, changes in patterns of sleep, a lack of energy, and psychomotor agitation (Holland et al, 2017). Risk factors for depressive disorders include negative affect, adverse experiences, other mental health concerns or physical illnesses, and family members with depressive symptoms (APA, 2013).

Anxiety Symptoms. Young children may respond differently than older children when feeling anxious (Holland et al, 2017). For instance, children who are in kindergarten may be more likely to experience physiological responses (e.g., stomach aches) and may engage in clingy behaviours, temper tantrums, and prolonged bouts of crying (Holland et al., 2017; Whalen et al., 2017). Separation anxiety disorder, social anxiety disorder, and generalized anxiety disorder are three common anxiety disorders in younger children (Whalen et al., 2017).

Separation anxiety disorder is the most commonly occurring anxiety disorder in children less than 12 years of age (APA, 2013) affecting approximately 0.3%-10.5% of children aged 2-5 years (Bufferd et al., 2011; Egger & Angold, 2006; Franz et al., 2013; Lavigne et al., 2009; Wichstrøm et al., 2012). Specifically, it entails “developmentally inappropriate and excessive fear or anxiety concerning separation from those to whom the individual is attached...” (APA, 2013, p. 190). For younger children there may be a reluctance to attend school, and some may only express symptoms upon separation from their attachment figures (APA, 2013).

Social anxiety disorder and generalized anxiety disorder are two other anxiety disorders that young children exhibit (Holland et al., 2017). Among children between 2-5 years of age social anxiety disorder has a prevalence of 0.5%-7.5% (Bufferd et al., 2011; Egger & Angold, 2006; Franz et al., 2013; Wichstrøm et al., 2012), and generalized anxiety disorder has a prevalence rate ranging from 0.6%-8.6% (Bufferd et al., 2011; Egger & Angold, 2006; Franz et al., 2013; Lavigne et al., 2009). While social anxiety disorder concerns fear and/or anxiety as it pertains to social situations wherein the individual may be scrutinized/judged by others, generalized anxiety entails a disproportionate amount of anxiety/worry about numerous situations and events (APA, 2013). Taken together, given the significance of internalizing symptoms among young children, it is imperative to understand them during Covid-19.

Children’s Mental Health During Covid-19

The recent declaration of a Canada-wide pediatric mental health crisis (Children First Canada, 2021) has alerted many to the mental health issues that were spurred by the pandemic. Specific to an Ontario context, a study that used two community cohort samples and two clinical cohort samples found that between 46.5% to 53.6% of children and youth experienced an increase in anxious, depressive, irritable, inattentive, and hyperactive symptoms following the emergence of the pandemic (Cost et al., 2021). In younger children (aged 2-5 years), it was found that 66.7% had an increase in at least one of the three mental health symptoms that were measured (i.e., hyperactivity, irritability, anxiety). However, it is important to note that while majority of the children and youth tended to experience increased struggles during the pandemic, there was a small subset who fared better (Cost et al., 2021). While few studies to date have focused on young children in the primary grades, one study with a participant mean age of 5.69 years found that young boys exhibited worsened mental health within the first week and a half of the announcement of the pandemic, whereas there were no significant changes in the mental health of young girls (Browne et al., 2021). The authors suggest that young boys might be more vulnerable to adverse outcomes and display more externalizing behaviours than girls, which may be more observable in comparison to the internalizing symptoms that are commonly displayed by young girls. Seeing as ADHD and internalizing symptoms are common in early childhood (APA, 2013; Fulton et al., 2009; Lavigne et al., 2009), it is important to understand these particular symptoms in the context of Covid-19.

Children's ADHD Symptoms During Covid-19

It has been noted that children with an ADHD diagnosis may experience elevated behavioural concerns during Covid-19 as they may be more vulnerable to pandemic-related stressors, such as social distancing (Cortese et al., 2020). Hai and colleagues (2021) also found that children with symptoms of ADHD have been disproportionately affected by the pandemic, as evidenced by their difficulties transitioning to virtual learning and increases in anxiety and depressive symptoms. Furthermore, in a longitudinal study during the pandemic, children with a diagnosed, or suspected, neurodevelopmental disorder had more pronounced clinical-level emotional, behavioural, ADHD, and peer problems at a second timepoint than neurotypical participants (Takahashi & Honda, 2020).

While these findings speak about ADHD in the context of a diagnosis, some studies have taken a dimensional approach. A study conducted in France found that 24.8% of children had

ADHD symptoms during the fifth week of the first Covid-19 lockdown, though it is important to note that there was no indication of the baseline of ADHD symptoms in France (Moulin et al., 2021). Additionally, a meta-analysis that primarily looked at community samples found that 30.8% of children/youth had symptoms of inattention during the pandemic (Panda et al., 2021). In alignment with this idea, Jiao and colleagues (2020) found that being inattentive was one of the most severe symptoms among those aged 3-18 years in the early onset of the pandemic.

Using a community sample in Japan, Takahashi and Honda (2020) found that children who displayed subclinical levels of ADHD increased from March to May 2020. Moreover, higher ADHD symptoms in March 2020 predicted increased clinical levels of conduct behaviours in May 2020. Furthermore, among children in grades 1-3, the prevalence of clinical-level ADHD symptoms increased more than two-fold from 22.0% to 51.3% (Takahashi & Honda, 2020). Ravens-Sieberer and colleagues (2021) examined the mental health symptoms of children/youth aged 7-17 years in Germany during Covid-19 and compared these findings to pre-Covid data from a national study that examined child/youth well-being. An increase in both subclinical and clinical levels of hyperactivity was found during Covid-19 compared to beforehand. In contrast, Adegbeye and colleagues (2021) found that young children at-risk for developing mental health disorders had no significant changes in ADHD symptoms from before to during the pandemic. It was suggested that since these children had high levels of externalizing symptoms before the pandemic, their behaviours may improve when they do not have the added stress of needing to attend school. Taken together, these findings indicate that the risk associated with the pandemic for children with ADHD symptoms, at both clinical sub-clinical levels, remains unclear.

Cost and colleagues (2021) found that a common risk factor for both inattention and hyperactivity symptoms was enhanced stress due to being socially isolated, while risk factors for hyperactivity alone entailed being male, older, and having a mental health or neurodevelopmental disorder diagnosis before the pandemic. Takahashi and Honda (2021) found that the child's academic year predicted ADHD symptoms at a second timepoint, whereby a lower academic year predicted higher symptoms. Moulin and colleagues (2021) found that risk factors for children's ADHD symptoms included other sociodemographic and mental health variables, such as financial concerns, parent unemployment, parental mental health, and child's sleeping difficulties. Ravens-Sieberer and colleagues (2021) reported that lower parental education was a risk factor. Interestingly, Cost and colleagues (2021) found that the only protective factor for

inattention symptoms was familial financial concerns. While this finding may initially seem contradictory, it was suggested there could be a non-linear relationship between the variables. That is, children may experience an improvement in symptoms due to factors such as parents having additional time if they are unemployed, or the family receiving more money from emergency benefits relative to before the pandemic. It is important to note that some of these findings are contradictory, as research in this area is new and risk factors are not yet fully understood.

Children's Internalizing Symptoms During Covid-19

Children's internalizing symptoms, namely those that pertain to anxiety and depression, have been some of the most researched mental health variables during the pandemic. This has been evidenced in several reviews that have shown high levels of these symptoms among children/youth (e.g., Marques de Miranda et al., 2020; Racine et al., 2020). However, most studies have been cross-sectional in nature and, as such, only reflect a time-limited snapshot of children's mental health symptoms, as opposed to fluctuations over time.

A meta-analysis of community samples (i.e., all but two studies) found that 42.3% of children/youth were irritable, 41.7% expressed depressive symptoms, and 34.5% expressed anxiety symptoms (Panda et al., 2021). Specific to young children, a study conducted in the United States looked at depression symptoms among those with a mean age of 4.1 years, whereby 39.9% scored above the cut-off for a clinical referral (Glynn et al., 2021). A Chinese study conducted during the first Covid-19 lockdown found that 22.6% of children had depressive symptoms and 18.9% had anxiety symptoms (Xie et al., 2020). There were similar findings in other countries. For instance, a study conducted in Brazil revealed that the prevalence of anxiety symptoms among children aged 6-12 years was between 19.4% and 21.8% (Garcia de Avila et al., 2020) and a study in Iran found that 16.2% of girls aged 7-13 years had severe Covid-related anxiety (Shahrbabaki et al., 2021). Some European studies found even higher prevalence rates. For instance, Orgilés and colleagues (2021) found that 38.1% of European children displayed anxiety symptoms and 19% displayed depressive symptoms. Additionally, Francisco and colleagues (2020) found that approximately 33% of children experienced nervousness, restlessness, uneasiness, and anxiousness during the initial Covid-19 lockdown. Others found much lower prevalence rates of approximately 7.2% for either high emotional concerns or levels of depression (Ma et al., 2021; Moulin et al., 2021). Ravens-Sieberer and colleagues (2021)

found that 13.3% of the children/youth aged 7-17 years had significant emotional concerns during Covid-19 while 7.7% had subclinical levels of emotional concerns.

In Canada, Mactavish and colleagues (2021) conducted a study in Summer 2020, whereby they examined child- and parent-reports of mental health symptoms of 8–13-year-old children in Southwestern Ontario. It was found that a substantial proportion of children had internalizing symptoms above the clinical threshold. For instance, approximately 26% had depressive symptoms above the clinical cut-off and between 34-36% had separation anxiety symptoms above the clinical cut-off. Moreover, children aged 9-11 years in Calgary self-reported their levels of anxiety and depressive symptoms, whereby 13.8% reported anxiety symptoms in the clinical range and 8.2% reported depressive symptoms in this range (McArthur et al., 2021).

While longitudinal studies in the realm of children's mental health during Covid-19 are scarce, there is some indication that internalizing symptoms are increasing among this group. Bignardi and colleagues (2021) conducted a study in the United Kingdom and found that children's depressive symptoms significantly increased after the pandemic in contrast to beforehand, but their anxiety symptoms did not change. Takahashi and Honda (2021) found that in Japan between March and May 2020 there were increases in clinically relevant emotional concerns among children in grades 1-3, with the prevalence rate increasing from 19.6% to 31.7%. Moreover, among an at-risk sample, mental health symptoms significantly increased during Covid-19, particularly internalizing symptoms (i.e., emotional concerns, peer problems, generalized anxiety, school-related anxiety, and somatic anxiety); however, there was a significant reduction in social and separation anxiety (Adegboye et al., 2021). Finally, Schmidt and colleagues (2021) found that 32.7% of children aged 1-6 years experienced general increases in emotional concerns and 33.8% experienced general increases in anxiety symptoms. Specifically, clinginess, crying frequently, and being sad all increased for over 20% of young children aged 4-6 years, while being upset upon separation from attachment figures and being nervous/worrying both increased for over 13% of young children. In contrast, pre-pandemic rates of internalizing symptoms globally for children and adolescents ranged from 2.6% (for depressive disorders) to 6.5% (for anxiety disorders) (Polanczyk et al., 2015) Thus, taken together, research from Canada and around the world shows that internalizing symptoms in children have increased during the Covid-19 pandemic.

Emerging research is also showing that changes in internalizing symptoms during the Covid-19 pandemic may differ based on the age of the children studied. For instance, Jiao and colleagues (2020) found that children aged 3-6 years, in contrast to those who were older, exhibited additional clingy behaviours and fearful attitudes that their loved ones would contract Covid-19. A qualitative study that examined the fears and worries of pre-school aged children (i.e., those 3-5 years of age) found that children worried about themselves or loved one's contracting the virus and whether things would ever return to normal, while also having increased generalized fears (Vasileva et al., 2021). Moreover, the behaviours of these young children were also impacted, as they were more irritable, clingy, prone to separation anxiety, cautious with following Covid-19 related precautions (e.g., hand hygiene), and less able to regulate their feelings. Taken together, these studies clearly illuminate the impact that Covid-19 has on children's internalizing symptoms and as such it is essential to understand the risk factors for increases in these symptoms during this time.

A number of individual and systemic factors have been identified as potential risk factors for children demonstrating higher levels of internalizing symptoms during the pandemic. For instance, being more worried, having pessimistic perceptions about Covid-19, and being less optimistic about the pandemic were all associated with an increased risk for internalizing symptoms (Schmidt et al., 2021; Xie et al., 2020). It was also found that increased stress due to being socially isolated was a risk factor for depressive and anxiety symptoms among children and adolescents (Cost et al., 2021). Moreover, having a mental health diagnosis, or in some cases a physical health diagnosis, prior to the pandemic was a risk factor (Cost et al., 2021; Marques de Miranda et al., 2020), as was contracting the virus (Marques de Miranda et al., 2020). However, it is important to note that having a mental health diagnosis prior to the pandemic may have also served as a protective factor for depression and anxiety symptoms, as the restrictions imposed by Covid-19 may have allowed some children to avoid anxiety-provoking situations (Cost et al., 2021). Additionally, being female and having larger financial concerns were also protective factors for anxiety symptoms. Regarding other individual level variables, Takahashi and Honda (2021) found that lower academic year predicted higher emotional concerns while Ma et al. (2021) found that being in middle school versus primary school was a risk factor for depressive symptoms. Among children aged 1-6 years, those who were older were at higher risk for emotional concerns (Schmidt et al., 2021). Lifestyle habits of children/youth are also important,

as engaging in more screen time and sleeping problems were identified as risk factors (McArthur et al., 2021; Moulin et al., 2021).

Family-Level Influences.

Variables at the family-level have also been identified as potential risk and protective factors for changes in internalizing symptoms during Covid-19. While Schmidt and colleagues (2021) found that higher parental education was a risk factor for young children's anxiety symptoms, Garcia de Avila et al. (2020) found that having younger parents with lower attained education was a risk factor. Ravens-Sieberer et al. (2021) found that lower parental education in and of itself was a risk factor, while others found that higher parental stress and parental internalizing symptoms were risk factors (Moulin et al., 2021; Orgilés et al., 2021; Schmidt et al., 2021), as well as lower socioeconomic status or financial concerns (Marques de Miranda et al., 2020; Moulin et al., 2021). Adegboye et al. (2021) found that even though the economic stress of the family was not directly linked to children's mental health, parental mental health mediated this relationship.

Additionally, certain household factors have been identified as risk factors. Garcia de Avila and colleagues (2020) found that being separated from one's parents during the pandemic was a risk factor for increased internalizing symptoms, while Schmidt and colleagues (2021) found that living with both parents was a risk factor for young children. The number of people within the household was also a risk factor, as some studies found that more (Fitzpatrick et al., 2020; Garcia de Avila et al., 2020) or less (Francisco et al., 2020) people in the house predicted higher internalizing symptoms. Important protective factors entailed maintaining family routines (Glynn et al., 2021) and being close to one's parents (McArthur et al., 2021). Other risk factors included not having access to an outdoor exit in their place of residence (e.g., a garden) and exposure to domestic violence (Francisco et al., 2020; Marques de Miranda et al., 2020). Finally, some risk factors entail societal factors, such as perceiving less social support from others, and more lenient protocols in one's jurisdiction (Fitzpatrick et al., 2020; Mactavish et al., 2021).

Indeed, there appears to be a significant impact on parents during this time as well. Gadermann and colleagues (2021) found that during the pandemic parents with younger children (i.e., those less than four years of age) experienced worsened mental health in contrast to those with older children. Parents also reported both increased negative (e.g., conflicts, raised voices, discipline) and positive (e.g., more time spent together, displays of affection) exchanges with

their children during the pandemic. Furthermore, Adams and colleagues (2021) found that approximately 70% of parents had significantly increased parenting stress during the emergence of Covid-19 compared to beforehand, with 55% of parents experiencing further escalated parental stress when their children resumed school in September 2020. Chung and colleagues (2020) found that parenting stress mediated the relationship between Covid-19 impacts and harsh parenting as well as parent-child closeness, whereby parents with increased parental stress engaged in more harsh parenting and were not as close to their children. Thus, something important to consider during Covid-19 is the parents' ability to be mindful of their parenting.

Mindfulness in Parenting

Mindfulness as a construct has been defined as, "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). Duncan (2007) proposed the idea of examining mindfulness in *interpersonal* relationships, claiming that a sole focus on *intrapersonal* mindfulness does not account for one's ability, or inability, to demonstrate these same skills in social interactions. Thus, the construct of mindful parenting was conceptualized with the intention to extend mindfulness from an intrapersonal activity to a process that can transpire in daily interactions with one's child (Duncan, 2007; Duncan et al., 2009). This extension of the mindfulness practice inherently makes sense, since mindfulness encompasses a loving, empathetic presence in regard to paying attention and is a quality that everyone possesses throughout the day (Kabat-Zinn, 2003).

Mindful parenting has gained traction within the past decade and a half among those interested in studying family dynamics (e.g., Duncan, 2007; Duncan et al., 2009) and is becoming a more common area of investigation (Henrichs et al., 2019). Mindful parenting is a specific, intentional parental approach/practice that entails attending carefully, nonjudgmentally, and compassionately to one's child and one's parenting practices. Specifically, it entails: 1) attending to one's child as they speak (i.e., attending to verbal and non-verbal cues during interactions), 2) accepting oneself and one's child in a non-judgmental manner (i.e., non-judgmentally accepting one's own and one's child's actions and personality traits, as well as accepting that there will be occasional hardships in parent-child dyads), 3) being attuned to one's own emotions and those of one's child (i.e., having the ability to identify one's own feelings and those of one's child and being able to decenter from one's emotions to be in the present-moment with one's child), 4)

regulating oneself during parenting practices (i.e., having low reactivity to typical behaviours observed in children and taking a moment before reacting), and 5) displaying compassion towards oneself and one's child (i.e., acknowledging and accepting one's own parenting efforts and showing empathy for oneself and one's child) (Duncan et al., 2009). It further entails changing one's level of awareness to understand that the present moment interaction with one's child is nested within the enduring parent-child relationship. Thus, mindful parenting captures elements that pertain to parents' emotional reactivity to their children and thoughts/attitudes in parenting interactions (Duncan, 2007). As such, it is a parenting practice that entails a growth element for all those involved (Kabat-Zinn & Kabat-Zinn, 2021).

Mindful parenting is believed to be associated with a host of positive, important outcomes, such as: parenting in a consistent/calm manner in alignment with one's values, fostering positive parent-child relations, demonstrating more flexibility and responsiveness when interacting with children, employing effective parenting practices, and reducing parental stress while bolstering children's well-being (Duncan et al., 2009). It has further been suggested that mindful parenting can function as a psychological resource when parents are placed in stressful and adverse situations, which may help parents to engage in useful coping mechanisms whilst preventing their stressors from negatively influencing their parenting and own mental health (Duncan et al., 2009). Moreover, it is well documented that mindful parenting is associated with positive mental health outcomes among children (e.g., Han et al., 2021; Parent et al., 2016; Wang & Lo, 2020).

Mindful parenting was originally examined in the context of relationships between parents and their adolescent children (Duncan, 2007) and has commonly been implemented in interventions to promote children's mental health and/or family functioning (e.g., Bögels et al., 2014; Dumas, 2005). However, few studies have examined the impact of mindful parenting of young children.

Parent and colleagues (2016) theorized that parents' intrapersonal mindfulness was related to children's internalizing and externalizing symptoms both directly and indirectly, the latter occurring primarily by employing mindful parenting and adopting other positive parenting behaviours (e.g., warmth) while engaging in less negative parenting behaviours (e.g., hostile reactions). Among parents of young children (i.e., those aged 3-8 years), mindful parenting was associated with increased positive parenting behaviours and decreased negative parenting

behaviours. Mindful parenting was indirectly linked to children's symptoms through engagement in positive parenting practices and was associated with less child internalizing symptoms (Parent et al., 2016). In a replication study in China, Han and colleagues (2021) found that mindful parenting was indirectly, inversely associated with children's internalizing and externalizing symptoms through the increased use of positive parenting practices. Furthermore, Henrichs and colleagues (2019) found that mindful parenting of four-year-old children mediated the relationship between anxiety during pregnancy and children's internalizing symptoms at age four, whereby higher levels of mindful parenting were associated with lower levels of children's internalizing symptoms. Furthermore, mothers' general anxiety and mindful parenting successively mediated the relationship between anxiety during pregnancy and children's current internalizing symptoms.

Some studies examined the ways in which specific facets of mindful parenting were associated with children's mental health symptomatology. Burgdorf and Szabó (2021) found that mothers being less judgmental towards their own parenting and being attuned to their children's feelings had children with lower levels of internalizing symptoms. A study conducted among Taiwanese parents found that accepting one's child in a non-judgmental manner moderated the positive relationship between parental stress and children's externalizing problems (Wang & Lo, 2020). In contrast, Maglica and colleagues (2020) found that mindful parenting did not predict children's internalizing symptoms. However, mindful parenting (i.e., empathy towards children and maternal non-reactivity) of five- to six-year-old children predicted children's externalizing symptoms. Further, paternal focus on, and acceptance towards, their children and maternal self-efficacy were associated with fewer behavioural concerns. Taken together, these studies suggest that embracing a mindful parenting approach is generally positively associated with better children's mental health outcomes variables.

The Current Study

Given that the impacts of the Covid-19 may vary among children of different ages, it is important to examine the effects of the pandemic on specific subsets of children over a longer period of time. Historically, research on young children's reactivity to distressing events is relatively limited in contrast to those examining effects among older children (Scheeringa & Zeanah, 2008). It is important to focus on mental health symptoms of young children during Covid-19, since their developmental stage may contribute to unique challenges for parents

(Schmidt et al., 2021). Moreover, their critical developmental stage warrants significant attention to ensure that their mental health is both maintained and bolstered (Marques de Miranda et al., 2020). Several researchers have underscored the importance of conducting longitudinal studies in the context of children's mental health during the pandemic (e.g., Browne et al., 2021; Wade et al., 2020). Despite an abundance of literature indicating that children's mental health is impacted by Covid-19, there is a paucity of research that examines how the pandemic specifically influences the mental health of young children and how children's mental health symptoms are associated with mindful parenting.

In light of the above literature, the purposes of this study were four-fold: 1) to examine whether children's ADHD symptoms, internalizing symptoms, and mindful parenting changed from the beginning to the end of the 2020-2021 academic year, 2) to examine whether children's ADHD symptoms at the beginning of the 2020-2021 academic year were associated with mindful parenting later in the academic year, 3) to examine whether children's depressive and anxiety symptoms moderated this relationship, and 4) to examine if child age or gender affected these associations. It was important to examine this information in the context of a community sample to gain a better understanding as to how young children and their parents are functioning during the pandemic, and to identify which families might require additional support and resources during this time.

With these broad goals in mind, there were five research questions for this study: 1) Do children's ADHD, depressive, and anxiety symptoms change from the beginning to the end of the 2020-2021 academic year? 2) Does mindfulness in parenting change from the beginning to the end of the 2020-2021 academic year? 3) Do children's ADHD symptoms at the beginning of the 2020-2021 academic year predict mindfulness in parenting at the end of the academic year? 4) Do children's depression and anxiety symptoms at the end of the 2020-2021 academic year moderate this relationship? and 5) Does child age and gender change the above associations?

A meta-analysis found that, globally, children and youth's anxiety and depression symptoms are increasing as the pandemic continues (Racine et al., 2021). This finding, together with the province-wide lockdown in Spring 2021 in Ontario during our second phase of data collection, led to the hypothesis that children's ADHD, depression, and anxiety symptoms will worsen as the 2020-2021 academic year continued. Regarding the second research question, while no studies to date have examined mindful parenting in the context of Covid-19, it is

hypothesized that mindful parenting decreased as the year continued due to changes in children's mental health and the stressors associated with parenting during a lockdown. It was further hypothesized that children's ADHD symptoms significantly, negatively predicted mindful parenting due to previous research showing that parents who have children with ADHD tend to experience high parenting stress (Anastopoulos et al., 1992; Johnston & Mash, 2001; Theule et al., 2013), challenges with parent-child exchanges (Johnston & Mash, 2001), and more distress than parents with typically developing children (Whalen et al., 2011). It was also hypothesized that both children's depressive and anxiety symptoms would moderate this relationship, since it is well-established that ADHD symptoms frequently co-occur with internalizing behaviours (APA, 2013) and there is some indication that internalizing symptoms exacerbate difficulties in relationships between children with ADHD symptoms and their parents (Deault, 2010). Finally, based on the findings of Cost and colleagues (2021) that being male is a risk factor for hyperactivity symptoms during Covid-19 while being female is a protective factor for anxiety symptoms, it is hypothesized that being male will significantly, negatively moderate the relationships. While the findings in regard to the association between child age and mental health symptoms during Covid-19 are mixed, it is hypothesized that being older will significantly, negatively moderate the relationships due to the need to transition out of a play-based learning curriculum (i.e., kindergarten) during Covid-19.

Methods

Participants

A total of 238 parents of junior and senior kindergarten students across six diverse schools in a large city in Eastern Ontario consented to participate in a larger, longitudinal study in Fall 2019. The focus of the larger study was parental engagement and children's behaviour and learning. Specifically, this thesis will look at data collected at two subsequent timepoints (i.e., Fall 2020 and Spring 2021) in the 2020-2021 academic year using a community (i.e., non-clinical) sample. It is important to note that Fall 2020 and Spring 2021 had two very different contexts due to the restrictions surrounding Covid-19. Specifically, in Fall 2020 schools were open and it was the parents' discretion whether they wanted their children engaged in virtual or in-person learning, whereas in Spring 2021 all students were engaged in virtual learning due to school closures because of Covid-19. Furthermore, Spring 2021 was also a time where there were many provincial restrictions, and the city was in a state of lockdown.

Inclusion criteria consisted of parents being sufficiently proficient in the English language; however, linguistic support was available upon request. Additionally, if the participating child had a diagnosis of autism spectrum disorder (ASD) or an Intellectual Disability (ID), they were not eligible. Children with a diagnosis of ASD were excluded from this study because while ASD and ADHD share many behaviours, the underlying etiology of these disorders and how the symptoms manifest and impact the lives of children and families are quite different. Thus, for these reasons children with an ASD diagnosis were excluded from this study.

There were 139 parents who completed the survey in Fall 2020 and 177 parents who completed the survey in Spring 2021. Two parents were removed due to meeting the exclusion criteria (i.e., their children being diagnosed with ASD or ID). The final sample consisted of 114 parents who completed all relevant scales at both time-points. A power analysis suggested a minimum sample of 84 for correlational analyses and 77 for moderated regressions, thus our sample of 114 was deemed adequate. The mean age of the participating parents was 39.18 years ($SD = 4.14$), of which 94 (82.5%) were female. The majority were married or living together as if married (94.7%) and approximately half (50.9%) had an annual family income between \$146,000 to \$399,999, while majority of the rest had a lower income. Sixty participants (52.6%) reported that their children were girls and the mean age of the participating children was 5.57 years ($SD = 0.57$). There were no significant differences across the two timepoints (i.e., Fall 2020 and Spring 2021) along sociodemographic characteristics (e.g., annual family income). Furthermore, no significant differences were found along sociodemographic characteristics between those who participated in the study at both timepoints and those who only participated at one timepoint. The average level of inattentive and hyperactive symptoms in our sample was 0.74 (on the 0 – 3 item scaling), which is consistent with the means reported for the standardization sample for boys (0.70) and for girls (0.53) (DuPaul et al., 2016). Additional descriptive data can be found in Table 1. Moreover, differences in children’s mental health symptoms and mindful parenting among the child’s gender can be found in Table 2.

Table 1

Participant Sociodemographic Characteristics

Participants
$n = 114$

Age in years, mean (SD)*	39.18 (4.14)
Gender, n (%)	
Female	94 (82.5%)
Male	20 (17.5%)
Highest level of completed education, n (%)	
Less than high school	1 (0.9%)
High school or GED	2 (1.8%)
Some college	2 (1.8%)
College diploma	15 (13.2%)
Bachelor's degree	56 (49.1%)
Some graduate work	5 (4.4%)
Graduate degree	33 (29.0%)
Marital status, n (%)	
Single, never married	1 (0.9%)
Divorced/separated	5 (4.4%)
Married/living together as if married	108 (94.7%)
Hours worked per week, n (%)	
0-20 hours/week	18 (15.8%)
21-39 hours/week	41 (36.0%)
40+ hours/week	55 (48.2%)
Annual family income, n (%)*	
\$13,000 to \$39,999	7 (6.3%)
\$40,000 to \$92,999	16 (14.1%)
\$93,000 to \$145,999	29 (25.4%)
\$146,000 to \$399,999	58 (50.9%)
Greater than \$400,000	2 (1.8%)
Child's gender, n (%)	
Female	60 (52.6%)
Male	54 (47.4%)
Child's age in years, mean (SD)	5.57 (0.57)
Child's grade level, n (%)	

Senior kindergarten	47 (41.2%)
Grade 1	67 (58.8%)
Child diagnosis of behavioural/mental health disorder, n (%)	
Yes	5 (4.4%)
No	109 (95.6%)
Child medicated for behavioural/mental health disorder, n (%)	
Yes	-
No	114 (100.0%)

Note. Participant demographics were analyzed using the Fall 2020 timepoint.

*The sample size for parent age was 113 and the sample size for annual family income was 112.

Table 2

Differences in Study Variables Among Children's Gender

Study Variables	Boys		Girls		<i>t</i> (112)	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
ADHD Symptoms	.85	.56	.64	.53	2.07	.041
Anxiety Symptoms	.45	.50	.35	.36	1.19	.235
Depression Symptoms	.25	.39	.12	.29	2.01	.046
Mindful Parenting	3.69	.42	3.70	.44	-.01	1.00

Procedure

Institutional approval was provided by the *University of Ottawa Research Ethics Board* and a school board within Ontario. Parents gave informed consent on paper and completed the survey electronically, which consisted of a demographic questionnaire and rating scales. The

survey was completed at two timepoints, once between November 2020-December 2020 (i.e., Fall 2020) and again between May-June 2021 (i.e., Spring 2021). The average follow-up time between responses was 158.72 days (i.e., ~5 months). Of the 238 parents who initially consented, 6 were not contacted for follow-up due to a withdrawing of consent, having an incorrect/out of date email, or moving out of province. Follow-up emails were used to reduce attrition. The response rate for this study was 47.9%.

Measures

Children's ADHD Symptoms

The ADHD Rating Scale-5 for Children and Adolescents, Home Version (ADHD RS-5; DuPaul et al., 2016) was used to measure children's ADHD symptoms in Fall 2020 as per the criteria outlined in the *Diagnostic and Statistical Manual of Mental Disorders 5* (DSM-5; APA, 2013). There were two nine-item subscales which represented children's inattentive symptoms (e.g., "Fails to give close attention to details or makes careless mistakes in schoolwork or during other activities") and hyperactive/impulsive symptoms (e.g., "Fidgets with or taps hands or feet or squirms in seat"). A composite score for ADHD symptoms (i.e., the average of all 18 items) was calculated for the purposes of this study. Response options ranged from 0 (*never or rarely*) to 3 (*very often*), in which case higher scores reflected more frequent children's ADHD symptoms in the past six months. This scale has demonstrated a strong internal consistency of $\alpha = .93$ in this sample. Furthermore, DuPaul et al. (2016) found that there is adequate construct validity of this scale, as evidenced by strong correlations between the ADHD RS-5 and another commonly used measure to assess children's ADHD symptoms, Conner's Parent Rating Scale.

Children's Internalizing Symptoms

The Child and Adolescent Symptom Inventory-Progress Monitor Parent Checklist (CASI-PM-P; Gadow & Sprafkin, 2005) is a 29-item scale used to measure various mental health symptoms among children and youth, and was used in this study to measure children's internalizing symptoms in Spring 2021. This study used the four-item global depression subscale (e.g., "Is depressed/sad for most of the day") and the seven-item global anxiety subscale designed for children aged 3-5 years (e.g., "Has difficulty controlling worries"), both of which involved calculating mean scores. Response options range from 0 (*never*) to 3 (*very often*), in which case higher scores reflected more severe symptoms in the past month. The CASI-PM-P showed adequate internal consistency for the global depression and anxiety subscales ($\alpha = .81$ and $\alpha =$

.80) in this sample. Furthermore, Gadow and Sprafkin (2005) found that the test-retest reliability was strong for both global anxiety (.94) and global depression (.84) after one month. The validity of this scale was assessed through comparing the progress of children who remained in therapy for an extended period of time with those who dropped out early. It is important to note that there were no differences between the two groups on baseline scores of mental health concerns. An improvement in mental health symptoms was noted for those who engaged in therapy for an extended period in contrast to those who dropped out early.

Mindful Parenting

The Interpersonal Mindfulness in Parenting Scale (IEM-P; Duncan, 2007) was used to measure participants mindful parenting in Spring 2021 (e.g., “I am aware of how my mood affects the way I treat my child”), whereby the 10 items were averaged together. This scale features items that pertain to: 1) parents’ awareness/present-centered attention directed towards their own inner experiences and their children, 2) parents’ ability to non-judgmentally and openly receive the cognitions/feelings of their children, and 3) non-reactivity towards their children’s actions. Response options ranged from 1 (*never true*) to 5 (*always true*), with higher scores reflecting more mindful parenting in daily interactions with one’s child. This scale was shown to have adequate internal consistency $\alpha = .75$ in this sample. Furthermore, Duncan (2007) found strong validity for mindful parenting in that it is separate from, yet positively related to, other important parenting constructs (i.e., child management and the emotional quality found in the mother-child relationship).

Data Analytic Approach

To address the first objective, four separate paired samples t-tests were conducted to determine how children’s mental health symptoms (i.e., ADHD, depressive, and anxiety symptoms) and mindful parenting changed from Fall 2020 to Spring 2021. To address the second objective, a bivariate correlation was conducted to determine how children’s ADHD symptoms in Fall 2020 were associated with mindful parenting in Spring 2021. To address the third objective, two separate moderation analyses were conducted using PROCESS macro for SPSS (v 3.5; Hayes, 2018). Children’s ADHD symptoms was the predictor variable, mindful parenting was the outcome variable, and children’s depression or anxiety symptoms functioned as separate moderating variables. Significant interactions were explored by examining simple slopes of

ADHD on mindful parenting at the mean, one SD above the mean, and one SD below the mean for the moderator variable.

Furthermore, secondary analyses were conducted to examine whether the sex and age of children had any influence on their ADHD, anxiety, and depression scores and on mindful parenting implemented by their parents. These secondary analyses were addressed through conducting moderated regression analyses. In order to conduct the moderated regression analyses certain variables were mean-centered (i.e., ADHD symptoms, depression symptoms, anxiety symptoms, and child age). The child gender variable was computed to a dichotomous variable, whereby 0 = male and 1 = female, as no children in this study identified as gender diverse. All the two-way and three-way product terms involving these variables were computed. In the regression analyses, the dependent variable was mindful parenting and ADHD symptoms was a predictor variable. Four separate regression models were conducted, as two models included anxiety symptoms and the other two models included depression symptoms. The regression analyses also differed based on whether child gender or age was being taken into consideration as another predictor variable. In all moderated regressions, the significance of highest-order terms were interpreted and then the regression model was simplified if the higher-order terms were not significant (i.e., if the three-way interaction term was not significant, it was removed from the model to determine whether any of the two-way interactions were significant). Thus, the complexity of the moderated regressions were reduced until it was determined which variables, or interaction terms, independently predicted mindful parenting. Follow-up analyses were conducted when necessary to determine the effects of any interaction terms.

Results

Children's Mental Health Symptoms and Mindful Parenting Over Time

There were no significant changes in children's ADHD symptoms ($t(113) = -1.91, p > .05$), anxiety symptoms ($t(112) = -1.51, p > .05$), depression symptoms ($t(112) = -1.57, p > .05$), or mindful parenting ($t(108) = 1.52, p > .05$) from Fall 2020 to Spring 2021 (see Table 3). That is, over the course of these few months during the pandemic there were no significant increases or declines in children's mental health symptoms or mindful parenting.

Table 3

Changes in Mental Health Symptoms and Mindful Parenting

	Fall 2020, mean (SD)	Spring 2021, mean (SD)	t	df	p
ADHD	0.74 (0.55)	0.79 (0.57)	-1.91	113	.06
Symptoms					
Anxiety	0.35 (0.32)	0.40 (0.43)	-1.51	112	0.13
Symptoms					
Depression	0.14 (0.27)	0.18 (0.35)	-1.57	112	0.12
Symptoms					
Mindful	3.75 (0.37)	3.70 (0.43)	1.52	108	0.13
Parenting					

Children's Symptoms of Inattention and Hyperactivity and Mindful Parenting

Children's symptoms of inattention and hyperactivity significantly, negatively predicted mindful parenting, $r(112) = -.25, p < .01$ (see Table 4). That is, parents who reported higher symptoms of inattention and hyperactivity in their children in the Fall reported lower levels of mindful parenting practices in the Spring.

Table 4

Descriptive Statistics and Correlation Matrix for Study Variables

Variable	M	SD	1	2	3	4	5
1. Children's Symptoms of Inattention and Hyperactivity (Fall)	.74	.55	-				
2. Children's Anxiety Symptoms (Spring)	.40	.43	.40*	-			
3. Children's Depressive	.18	.35	.48*	.50*	-		

Symptoms (Spring)							
4. Mindful Parenting	3.69	.43	-.25*	.01	-.09	-	
(Spring)							
5. Children's Age	5.57	.57	.13	-.04	.06	.00	-

* $p < .01$

Children's Internalizing Symptoms as Moderators

Children's anxiety symptoms did not significantly moderate the relationship between symptoms of inattention and hyperactivity and parenting, $b = .078$, 95% CI [-.184, .340], $t = .59$, $p = .56$ (see Table 5); however, children's depressive symptoms did significantly moderate this relationship, $b = .354$, 95% CI [.022, .686], $t = 2.11$, $p < .05$ (see Table 6). Specifically, there was a significant, negative relationship between children's symptoms of inattention and hyperactivity and mindful parenting when children's depressive symptoms are either low, $b = -.299$, 95% CI [-.480, -.119] $t = -3.29$, $p < .01$ or average, $b = -.237$, 95% CI [-.397, -.076] $t = -2.92$, $p < .01$, but not when depressive symptoms are high, $b = -.114$, 95% CI [-.295, .066] $t = -1.26$, $p > .05$ (see Figure 1).

Table 5

Model of Predictors of Mindful Parenting with Anxiety as Moderator

	<i>b</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Constant	3.69 [3.61, 3.77]	0.04	90.19	$p < .001$
Children's Symptoms of Inattention and Hyperactivity (Fall)	-0.25 [-0.41, -0.09]	0.08	-3.03	$p < .01$
Children's Anxiety Symptoms (Spring)	0.10 [-0.12, 0.31]	0.11	0.88	$p = 0.38$

Children's Symptoms of Inattention and Hyperactivity x Children's Anxiety Symptoms	0.08 [-0.18, 0.34]	0.13	0.59	$p = 0.56$
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Note. $R^2 = .08$.

Table 6

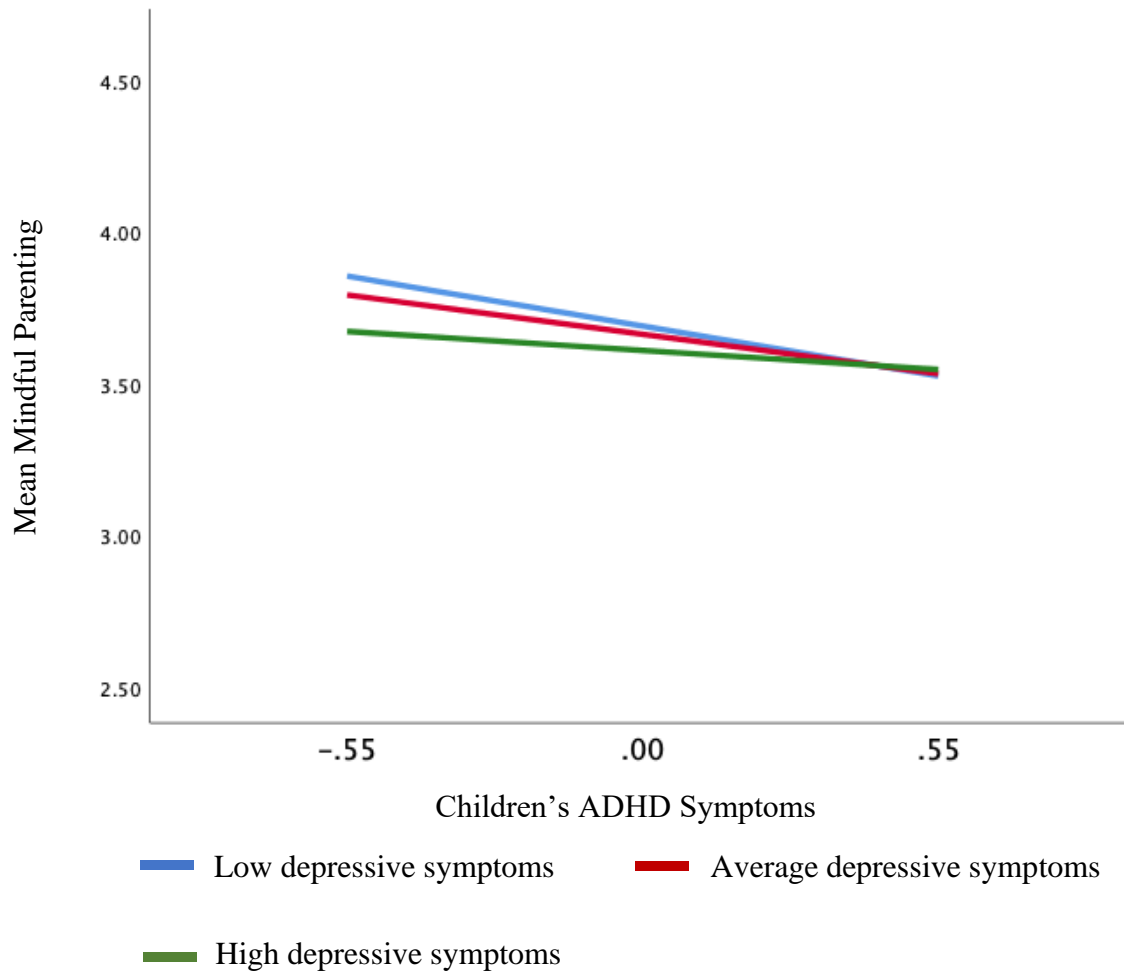
Model of Predictors of Mindful Parenting with Depression as Moderator

	<i>b</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Constant	3.66 [3.58, 3.74]	0.04	88.78	$p < .001$
Children's Symptoms of Inattention and Hyperactivity (Fall)	-0.24 [-0.40, -0.08]	0.08	-2.92	$p < .01$
Children's Depressive Symptoms (Spring)	-0.15 [-0.47, 0.16]	0.16	-0.98	$p = 0.33$
Children's Symptoms of Inattention and Hyperactivity x Children's Depressive Symptoms	0.35 [0.02, 0.69]	0.17	2.11	$p < .05$

Note. $R^2 = .10$.

Figure 1

Simple Slopes of the Regression of Mindful Parenting on Children's ADHD Symptoms at Three Levels of Children's Depression Symptoms



Note. This figure demonstrates that when children's depressive symptoms were low or average it was found that higher ADHD symptoms were associated with lower levels of mindful parenting. However, when children's depressive symptoms were high their ADHD symptoms were not predictive of mindful parenting.

The Effects of Children's Age and Gender

The three-way interaction term that included children's ADHD symptoms, anxiety symptoms, and age was not a significant predictor of mindful parenting ($\beta = .081, p > .05$) nor were the two-way interactions that accounted for anxiety symptoms and age ($\beta = -.007, p > .05$), ADHD symptoms and age ($\beta = -.025, p > .05$), or ADHD symptoms and anxiety symptoms ($\beta = .067$; see Table 7). In this moderated regression model, the only variable that had any influence on mindful parenting was children's ADHD symptoms ($\beta = -.308, p < .05$). Similarly, the three-way interaction term that included children's ADHD symptoms, depression symptoms, and age was not a significant predictor of mindful parenting ($\beta = -.186, p > .05$) nor were the two-way

interactions that accounted for depression symptoms and age ($\beta = .196, p > .05$), ADHD symptoms and age ($\beta = -.113, p > .05$), or ADHD symptoms and depression symptoms ($\beta = .185, p > .05$; see Table 8). In this moderated regression model, the only variable that had any influence on mindful parenting was children's ADHD symptoms ($\beta = -.271, p < .05$). That is, in both moderated regression analyses that included children's age, the age variable did not affect the relationships in an interactive way, nor did it emerge as a covariate. Instead, in both models the only variable that independently predicted mindful parenting was children's ADHD symptoms, as the only significant relationship that emerged was the linear relationship between ADHD symptoms and mindful parenting.

Table 7

Moderated Regression Between Children's ADHD Symptoms, Anxiety Symptoms, and Age

	<i>b</i>	<i>SE B</i>	β	<i>p</i>
Step 1				
Children's Symptoms of Inattention and Hyperactivity x Children's Anxiety Symptoms x Children's Age	.20	.37	.08	.59
Step 2				
Children's Symptoms of Inattention and Hyperactivity x Children's Anxiety Symptoms	.08	.15	.07	.61

Children's Symptoms of Inattention and Hyperactivity x Children's Age	-.04	.16	-.03	.81
Children's Anxiety Symptoms x Children's Age	-.01	.21	-.01	.95
Step 3 Children's Symptoms of Inattention and Hyperactivity	-.24	.08	-.31	.00
Children's Anxiety Symptoms	.13	.10	.13	.20
Children's Age	.04	.07	.05	.61

Table 8

Moderated Regression Between Children's ADHD Symptoms, Depression Symptoms, and Age

	<i>b</i>	<i>SE B</i>	β	<i>p</i>
Step 1				
Children's Symptoms of Inattention and Hyperactivity x Children's Depression Symptoms x Children's Age	-.54	.50	-.19	.28

Step 2				
Children's Symptoms of Inattention and Hyperactivity x Children's Depression Symptoms	.25	.18	.19	.18
Children's Symptoms of Inattention and Hyperactivity x Children's Age	-.18	.16	-.11	.28
Children's Depression Symptoms x Children's Age	.49	.29	.20	.09
Step 3				
Children's Symptoms of Inattention and Hyperactivity	-.21	.08	-.27	.01
Children's Depression Symptoms	.04	.13	.04	.74
Children's Age	.03	.07	.04	.70

The three-way interaction term that included children's ADHD symptoms, anxiety symptoms, and gender was not a significant predictor of mindful parenting ($\beta = .094, p > .05$) nor were the two-way interactions that accounted for anxiety symptoms and gender ($\beta = .104, p > .05$), ADHD symptoms and gender ($\beta = -.086, p > .05$), or ADHD symptoms and anxiety

symptoms ($\beta = .089, p > .05$; see Table 9). In this moderated regression model, the only variable that had any influence on mindful parenting was children's ADHD symptoms ($\beta = -.308, p < .05$). Contrastingly, the three-way interaction term that included children's ADHD symptoms, depression symptoms, and gender was a significant predictor of mindful parenting ($\beta = .385, p < .05$; see Table 10). Thus, the interaction among child ADHD symptoms and depression is different across child gender. To follow-up on this result, the data file was split by child gender and a moderated regression analysis was conducted to determine the effect of the ADHD and depression interaction term on mindful parenting among boys and girls separately. It was found that there was a multiplicative effect of ADHD and depression symptoms on mindful parenting among girls ($\beta = .544, p = .001$) but not among boys ($\beta = .063, p > .05$; see Table 11). That is, when depression symptoms were taken into consideration the child's gender affected the relationship between ADHD symptoms and mindful parenting in an interactive way. Specifically, depression symptoms did not affect the relationship between ADHD symptoms and mindful parenting among boys, but the depression symptoms did affect the relationship between ADHD symptoms and mindful parenting among girls.

Table 9

Moderated Regression Between Children's ADHD Symptoms, Anxiety Symptoms, and Gender

	<i>b</i>	<i>SE B</i>	β	<i>p</i>
Step 1				
Children's Symptoms of Inattention and Hyperactivity x Children's Anxiety Symptoms x Children's Gender	.34	.39	.09	.39
Step 2				

Children's Symptoms of Inattention and Hyperactivity x Children's Anxiety Symptoms	.10	.16	.09	.53
Children's Symptoms of Inattention and Hyperactivity x Children's Gender	-.10	.17	-.09	.58
Children's Anxiety Symptoms x Children's Gender Step 3	.17	.24	.10	.47
Children's Symptoms of Inattention and Hyperactivity	-.24	.08	-.31	.00
Children's Anxiety Symptoms	.12	.10	.12	.22
Children's Gender	-.04	.08	-.05	.63

Table 10

Moderated Regression Between Children's ADHD Symptoms, Depression Symptoms, and Gender

	<i>b</i>	<i>SE B</i>	β	<i>p</i>
Step 1				
Children's Symptoms of Inattention and Hyperactivity x Children's Depression Symptoms x Children's Gender	1.00	.38	.39	.01

Table 11

Moderated Regression Between Children's ADHD Symptoms and Depression Symptoms Split Between Young Boys and Young Girls

		<i>b</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Boys	Constant	3.71	.06		61.60	.00
	Children's Symptoms of Inattention and Hyperactivity	-.11	.13	-.15	-.86	.39
	Children's Depression Symptoms	-.14	.21	-.13	-.66	.52
	Children's Symptoms of Inattention and	.07	.22	.06	.31	.76

	Hyperactivity x Children's Depression Symptoms					
Girls	Constant	3.57	.06		60.95	.00
	Children's Symptoms of Inattention and Hyperactivity Children's Depression Symptoms	-.28	.10	-.33	-.268	.01
	Children's Symptoms of Inattention and Hyperactivity Children's Depression Symptoms	-0.39	.25	-.26	-1.56	.13
	Children's Symptoms of Inattention and Hyperactivity x Children's Depression Symptoms	1.07	.31	.54	3.47	.00

Discussion

The purposes of this study were to examine whether: 1) young children's ADHD symptoms and internalizing symptoms as well as mindful parenting changed from the beginning to the end of the 2020-2021 academic year, 2) young children's ADHD symptoms at the beginning of the 2020-2021 academic year were associated with mindful parenting later in the academic year, 3) young children's depressive and anxiety symptoms moderated this relationship, and 4) the child's age or gender affected these associations. The findings from this study indicated that there were no significant changes in children's ADHD symptoms, anxiety symptoms, depressive symptoms, or mindful parenting from the beginning to the end of the

2020-2021 academic year. Moreover, children's symptoms of inattention and hyperactivity in Fall 2020 were significantly, negatively associated with mindful parenting in Spring 2021. Specifically, children's depressive symptoms in Spring 2021 negatively moderated this relationship when the depressive symptoms were either low or average but not when depressive symptoms were high. Contrastingly, children's anxiety symptoms did not significantly moderate the relationship between children's ADHD symptoms and mindful parenting. It was further found that children's age did not affect the associations. However, children's gender did affect the relationship between their ADHD symptoms and mindful parenting when depressive symptoms were also taken into account, as the negative relationship between children's ADHD symptoms and mindful parenting was significantly stronger among girls than boys. That is, young girls who express ADHD and depressive symptoms have parents who engage in less mindful parenting.

The finding that children's mental health symptoms did not significantly change over the course of the 2020-2021 academic year is somewhat in alignment with existing research findings, where there are mixed results. With respect to ADHD symptoms, Takahashi and Honda (2020) found that the prevalence of sub-clinical and clinical-level ADHD symptoms among a community sample of children increased from March-May 2020. Contrastingly, among an at-risk sample of children, it was found that there were no significant changes in ADHD symptoms when looking at differences from before to during Covid-19 (Adegboye et al., 2021). Regarding internalizing symptoms, one study found that children's depression symptoms significantly increased from before to during the pandemic while children's anxiety symptoms did not significantly change (Bignardi et al., 2021) while another study found increases in emotional concerns from March to May 2020 (Takahashi & Honda, 2021). Moreover, it was found that there were significant increases in generalized anxiety and emotional concerns from before the pandemic to during the pandemic in both at-risk (Adegboye et al., 2021) and community samples (Schmidt et al., 2021). It was further found that there were significant decreases in separation anxiety and social anxiety from before the pandemic to during the pandemic (Adegboye et al., 2021). This line of research is relatively new, and no studies have specifically examined how children's ADHD or internalizing symptoms changed throughout the pandemic. Thus, this study contributes some novel insights to the field and is partially supported by what other researchers found in regard to child ADHD (Adegboye et al., 2021) and anxiety symptoms (Bignardi et al., 2021) not significantly changing during the pandemic. This study also found that mindful

parenting did not significantly change from Fall 2020 to Spring 2021. No other studies were found where the researchers examined changes in mindful parenting during the Covid-19 pandemic. However, given that parents in this study were not taking part in an intervention to enhance or practice mindful parenting and due to the relatively high socioeconomic status among this sample and no significant changes in child mental health symptoms according to the parent perspectives, it inherently makes sense that this aspect of parenting would not fluctuate to a significant extent over a few months' time.

The significant, negative relationship between children's symptoms of inattention and hyperactivity and mindful parenting is in alignment with a study that found that parents of children with ADHD engaged in less mindful parenting than parents of children without ADHD (Evans et al., 2020). It was noted that high parental distress among those who have children with ADHD likely accounted for this finding (Evans et al., 2020). Thus, while parental distress was not measured in this study, it is well-established that parents of children with ADHD experience more distress (Evans et al., 2020; Modesto-Lowe et al., 2008; Whalen et al., 2011), which is likely exacerbated during a pandemic. Given that parental well-being has been found to be positively correlated with mindful parenting (Duncan, 2007), higher levels of parental distress might partly explain the negative relationship between children's symptoms of inattention and hyperactivity and mindful parenting. Compared to parents of neurotypical children, many parents of children with ADHD are more reactive, critical, and less responsive (Modesto-Lowe et al., 2008), all of which are contrary to the core aspects of mindful parenting. Furthermore, it has been noted that individuals with ADHD have experienced elevated behavioural concerns during Covid-19 (Cortese et al., 2020). Together with the government-mandated lockdowns, which included school closures, parents may have become more reactive to their children with symptoms of inattention and hyperactivity, even at subclinical levels, due to the increased amount of time spent together. Thus, this finding can be linked to the bioecological model (Bronfenbrenner & Evans, 2000) in that the children's symptoms of inattention and hyperactivity compounded with the context of Covid-19 and its subsequent environmental changes would have influenced the proximal process that exists between children's mental health symptoms as perceived by the parents and mindful parenting.

The finding that children's depressive symptoms moderated the relationship between children's ADHD symptoms and mindful parenting is consistent with a meta-analysis showing an

additive effect of ADHD and internalizing symptoms on parental stress (Theule et al., 2013). In the current study, it was found that at low and average levels of children's depressive symptoms, higher symptoms of inattention and hyperactivity were associated with lower mindful parenting whereas at high levels of children's depressive symptoms their symptoms of inattention and hyperactivity were not associated with mindful parenting. The fact that high levels of depressive symptoms was not a moderator may indicate that there are other unexplained factors (e.g., environmental, or developmental factors) that drive mindful parenting and influence the proximal process between children's symptoms of inattention and hyperactivity and mindful parenting when children have elevated levels of depressive symptoms. While these findings are interesting it is important to note that the average level of depressive symptoms was relatively low in this community sample and the effect size was small. Interestingly, children's anxiety symptoms did not moderate the relationship between children's symptoms of inattention and hyperactivity and mindful parenting. In this study children's depressive symptoms were reflective of slightly more observable behaviours (e.g., "has low energy, is tired for no apparent reason") than children's anxiety symptoms (e.g., "has difficulty controlling worries"). Thus, it is possible that children's depressive symptoms were more visible to parents compared to children's anxiety symptoms, particularly since young children are sometimes unable to identify their own anxiety cognitions and/or their anxiety manifests as somatic symptoms (e.g., stomach complaints) (Anxiety Canada, 2021).

Finally, in this study the child's age did not have an interactive effect nor did it influence the relationship between children's ADHD symptoms and mindful parenting when either children's anxiety or depression symptoms were considered. While there were mixed findings on whether being older was a risk factor for ADHD symptoms during the pandemic (Cost et al., 2021; Takahashi & Honda, 2021) and a previous study found that being in a lower academic year predicted heightened emotional difficulties during the pandemic (Takahashi & Honda, 2021) it is not surprising that the child's age did not have an effect in this study as the majority of the children were either five or six years of age. Thus, there was not a large spread of age that was accounted for in this study, and as such any age effects were not able to be effectively detected. In this study it was found that when young girls have ADHD symptoms as well as depressive symptoms it negatively impacts mindful parenting; however, this same association does not hold true when young boys are involved. It could very well be that the way in which these symptoms

are manifested in young girls versus young boys, and the fact that these symptoms (e.g., "On the go," acts as if "driven by a motor") may not be considered as developmentally appropriate in young girls versus their male counterparts, have an overall impact on mindful parenting.

Implications for Practice

Findings from this study highlight how parental perceptions of children's behaviours are associated with mindful parenting, in which case the pandemic might create additional challenges. Specifically, this study found that children's ADHD symptoms significantly, negatively predicted mindful parenting and that children's depression symptoms at low or moderate levels further contributed to this relationship. Furthermore, it was found that the child's gender further explained the relationship between child ADHD symptoms and mindful parenting, as this negative relationship was significantly stronger among girls than boys. Therefore, young girls who exhibit ADHD symptoms even at sub-clinical levels and who have slight to moderate depression symptoms during the pandemic are most at risk of having parents who are unable to engage in mindful parenting. This finding seems to signify that early emotion dysregulation in young girls, as evidenced through clusters of ADHD and depression symptoms, is challenging for parents. It may also signify that parents are more attuned to, and perhaps bothered by, what they perceive as gender-inappropriate behaviours among young girls. Given that mindful parenting is associated with many positive outcomes (e.g., lower parental stress, improved parent-child relations) (Duncan et al., 2009), it is important to find ways to foster these skills among parents of young children during the Covid-19 pandemic. As such, it is important for both clinicians and educators alike to be aware of these findings, since they might be in a position to provide these children and parents with additional supports, resources, and trainings/interventions during the pandemic to bolster their use of, and effective engagement in, mindful parenting.

Future Research

While this study generated some important findings in regard to the relationship that exists between various mental health symptoms among young Canadian children and mindful parenting during the Covid-19 pandemic, additional research may help clinicians better understand the role they can play in helping families. Specifically, future research should examine how mindful parenting and child mental health may be differentially affected during the pandemic, as well as investigating the perspectives of other adults (e.g., teachers). Future studies using cross-lagged designs will be important to fully understand how mindful parenting and

ADHD are related. Moreover, future research should use larger sample sizes and continue to monitor children's mental health and parenting variables throughout the pandemic. It is possible that this could shed light on bidirectional relationships among these variables (i.e., mindful parenting may also influence children's symptoms of inattention and hyperactivity). The incorporation of qualitative responses into this study may also be a future direction to explore, as parents and other supportive adults could provide some rich, insightful information about changes in the children's mental health symptoms and parenting from one time point to another. Furthermore, examining the different sub-types of ADHD symptoms (i.e., separating inattention and hyperactivity symptoms) and the different manifestations of anxiety symptoms (e.g., social anxiety, separation anxiety) as well as the different facets of mindful parenting could provide insight about which specific dimensions of these variables affect others.

Moreover, this study used a community sample in the province of Ontario. As such, future research should examine associations between these study variables in a sample of children with clinically elevated symptoms, since the results might be quite different. It would also be important to consider the perspectives of families in other provinces, since the responses to the Covid-19 pandemic were partially provincially based. Therefore, the results from this study cannot be generalized to those who reside within other provinces. Furthermore, expanding the age limits of future studies would be useful in order to see whether there are any differences in these relationships when examining young children versus middle-aged children versus adolescents. Finally, it is important to measure parental distress in future studies to see how this variable and more global aspects of parental mental health affect the mental health of their children and parenting practices.

Strengths and Limitations

One main strength of this study was that data were collected at two different timepoints; thus, it was possible to see how children's symptoms of inattention and hyperactivity during Fall 2020 were associated with mindful parenting later that year. Another strength was that there was a relatively equal number of young girls (52.6%) and boys (47.4%) whose parents completed the study. Thus, the results can be generalizable to both boys and girls, except for the finding that was different based on child gender.

While there were several notable strengths of this study, it is also essential to interpret the results of this study when considering its limitations. As this study is part of a larger, longitudinal

study that was established prior to the emergence of the Covid-19 pandemic, the graduate student who conducted this thesis did not have autonomy in selecting the measures that were adopted. Thus, had the graduate student been able to be involved in this decision-making process, and had the study been designed during the pandemic, other relevant measures may have been selected to use (e.g., scales to measure parental mental health, scales that had more internalizing symptoms). Furthermore, it is important to note that the present study only measured mindful parenting at the second timepoint. Thus, the directionality of effects cannot be determined using these data.

Moreover, the sample size was relatively small, and data were gathered solely through parent self-report. It could very well be that during the second timepoint the children's behaviours were not objectively changing, rather the tolerance threshold of certain parents could have lowered amid the pandemic. Thus, parents may have reported greater concerns among their children as a result of their own functioning and mental health being a year into the pandemic. Of course, the opposite could be true as well, in which case some parents may have provided socially desirable responses due to the nature of the online survey. There were also some parents who did not respond to all questions on the survey (i.e., missing data). One other limitation that is important to note is that participation was voluntary in this study; thus, there might be self-selection bias. It could very well be that parents who decided to participate were those who felt that their children had maintained stable mental health throughout the pandemic and that their parenting was proceeding smoothly. These limitations, along with the relatively high socioeconomic status among the sample, may have also resulted in an inflation in mindful parenting.

Conclusion

In conclusion, children's symptoms of inattention and hyperactivity are significantly, negatively associated with mindful parenting during the pandemic and children's low and moderate levels of depressive symptoms moderated this relationship, specifically among young girls. These findings provide new insight about how children's mental health is associated with parenting during a pandemic and how the child's gender affects these associations. These findings inform clinicians about which families might require additional support during the Covid-19 pandemic and beyond.

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