PANDEMIC PARENTING: STRESS AND RESILIENCE DURING THE COVID-19 PANDEMIC

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DEDICATION

To the parents.

To the kids.

To the children and youth who will inherit the world.

I hope that you find beauty, grace, and joy here.

ABSTRACT

This study examines and compares the experiences of parents at two time points during the first six months of the Covid-19 pandemic response in Canada. Two anonymous, online surveys were completed by 525 parents. Categories of questions included stressors, resilience resources, experiences with the education system, and behavioural manifestations of stress for both parents and children. Parents reported significant increases in their stress levels over time. At the first time point, resilience resources showed no impact on stress levels for parents, but the relationship between resilience resources and stress levels increased over time. The most significant stressors for parents included parenting, familial relationships, finances, and children's education. Parents reported significant increases in their own behavioural symptoms of stress from pre- to post-Covid-19, and high incidence of behavioural symptoms of stress in their children. Familial patterns of stress symptomology between parents and children emerged in both number and type of behaviour.

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I want to know what sustains you from the inside when all else falls away.

Oriah Mountian Dreamer

Thank you to my parents who were good enough when it was hard and have strived to be better every day since. Thank you for doing the sacred work of breaking the cycle. You are resilience and you are the reason for mine.

Thank you to all the other parents who have welcomed me into homes and families and relationships. I am forever grateful for being loved by you.

Thank you to the friends who walk alongside the heartaches and joys of being human in an imperfect world. Who inspire curiosity and creativity. Who seek adventure, hope, beauty, and love. Who demand nothing short of authenticity and wholeheartedness. Thank you for talking through philosophical conundrums, ranting about broken systems, laughing about impossible situations (and people), travelling, seeking rest, sharing your animals, homes, and food, and always seeking adventure and growth.

Thank you to my supervisors and professors who offered guidance, editing, and insight throughout the process of developing, analysing, and writing this study. Thank you especially your endless patience while I just barely grasped the intricacies of statistics.

Thank you to all of the parents, children, and youth with whom I have had the privilege of working and walking alongside. Thank you for inviting me into your lives. Thank you for your vulnerability. Thank you for allowing me to come alongside your deepest sorrows and greatest joys.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
APA	American Psychological Association
CDC	Centers for Disease Control and Prevention
CERB	Canada Emergency Response Benefit
CPIS	Covid-19 Parent Isolation Study
CPSRS	Covid-19 Parent Stress and Resilience Study
CRH	Corticotropin-Releasing Hormone
EFA	Exploratory Factor Analysis
ESHRE	European Society of Human Reproduction and Embryology
HPA	Hypothalamic-Pituitary-Adrenal
HSD2	11ß-Hydroxysteroid Dehydrogenase Type 2
OCMOH	Office of the Chief Medical Officer of Health
PTSD	Post-Traumatic Stress Disorder
WHO	World Health Organization

Chapter 1: Introduction and Literature Review

There is more reason in your body than in your deepest wisdom.

Friedrich Wilhelm Nietzsche (1883-1885/1969, p. 62)

Stress

Stress is a biological response to perceived threat that involves activation of the nervous system resulting in both behavioural and physiological changes. In a normal stress response, the body and brain activate their resources, identify the source of the stressor, act accordingly to deal with the stressor, and then shut the stress response down. However, in situations where the stressor is chronic or cannot be avoided, as well as in the aftermath of significant stressors leading to a trauma response, the brain may enter a cyclical stress response that is difficult to interrupt.

The experience of stress has three components: (1) the stress stimulus, or the stressor, (2) the processing system that experiences and interprets the meaning and significance of the stressor (in humans this is the nervous system, including the brain), and (3) the stress response, which consists of the various physiological and behavioural adjustments made in response to the perceived threat (Maté, 2003). A stressor can be anything that the organism experiences as a threat. These events may involve physical threat or threat to life; however, as a social and emotional species, stressors for humans often involve threat to relationship, threat to social engagement or social status, and can even be threat to one's perceived sense of self. Due to the power of relational attachment, humans often experience a threat response when their community or those individuals

whom they love and/or care for are threatened in some way (children, spouse, friend, etc.).

The definition of a stressor is contextual to person, culture, and society. What constitutes a stressor and will trigger a stress response are dependent on the meaning assigned to it by the individual and their community, the sensitivity of the nervous system, and the individual's past experiences and skills. For example, job loss will likely be more acutely stressful for a single parent living paycheck to paycheck than for an individual with a robust savings account; though if the single individual has a significant belief system about their worth in relation to their job, this increases the stakes of the loss and subsequently the stress response.

There is no formula for the relationship between a stressor and the stress response. The personality, psychological state, and culture of the individual upon whom the stressor is acting all play a role in the impact of the stressor. Each stressor is experienced in the present, but is informed by our past and by our cultural context as the nervous system and brain assess the stressor within the context of past experiences. If an individual has encountered this particular stressor before, and overcome it effectively, their nervous system is more likely to recognize the stressor as manageable.

In addition to the unconscious processing of the nervous system, the second step in the stress response (if the stress system is healthy and well-functioning) involves active cognitive appraisal. This involves a personal assessment of one's own skills and resources, internal or external, to manage the demands of the stressor. If the person assesses that they do have sufficient resources, this is often enough to shut the stress response down and/or avoid a full-blown stress response to begin with. However, if the

person does not believe that they possess, or can access, the resources that they need to overcome the stressor, a stress response will be initiated or sustained (Berjot & Gillet, 2011). This processing of threat through the lens of experience, with active cognitive appraisal, is referred to as perceived stress (Berjot & Gillet, 2011; Lazarus & Folkman, 1984). Perceived stress is often used as the outcome measurement in stress research as it is the subjective experience of stress, rather than the objective stressor, that produces the stress-related outcomes that most research is interested in.

Mild to moderate manageable experiences of stress over time build up a person's belief in their capacity to overcome future stressors and acts as a protective factor for the stress system in the future. However, under chronic stress conditions the stress system becomes damaged over time. When an individual faces repeated and/or chronic stressors, the stress system can become either sensitized or de-sensitized to stressors. This results in an over or under activation of the stress response that is objectively inappropriate to the current stressor. For example, if an individual has grown up in a neighbourhood with significant amounts of violence, they may jump at every loud sound, responding as though it is a gunshot; or, they may not flinch when they are with their friends and someone pulls out a gun.

Both chronic stress conditions and multiple, compounding stressors overwhelm the stress response system. Even small to moderate stressors that may not require a full-blown stress response can compound over time if the stressors are unresolved, leaving the individual with inadequate biological and psychological resources to cope. This compounding effect of stressors is referred to as allostatic load. Allostasis means stability through change, and refers to the process the body undertakes to keep itself in balance

(McEwan, 2005). An allostatic state is initiated in anticipation of environmental change or challenge and the body and brain activate neurotransmitters and hormones to prepare body systems to respond to the threat (Korte et al., 2005; McEwan, 2000a). Allostatic states are designed to be short-lived and can be sustained for limited periods provided that the food and/or energy stores are available to the organism. Allostatic load, or allostatic overload, refers to the price paid by the body for activating allostasis, and is used to describe the depletion of resources, or exhaustion of the stress response system as a result of chronic, sustained, or repeated stressors (Korte et al., 2005; McEwan, 2000a; McEwan, 2005).

Neurobiology of Stress

The system responsible for activating the stress response is the sympathetic nervous system. This system is referred to as the "go" system and the parasympathetic nervous system is the "rest and digest" system. During a stress response, the sympathetic nervous system is activated and the parasympathetic system is turned off. There are two pathways during a stress response: the fast-acting pathway and a slow-acting pathway. In the fast-acting pathway, the hypothalamus sends a signal to the medulla of the adrenal gland to release the catecholamines epinephrine and norepinephrine (Kolb & Whishaw, 2015, p. 169). Epinephrine and norepinephrine prime the body for an active response to threat by increasing heart rate, blood pressure, respiratory rate, and cell metabolism, particularly in the large muscles (Charmandari et al., 2005; Kolb & Whishaw, 2015, p. 169). Norepinephrine and corticotropin-releasing hormone (CRH) also increase body temperature (Charmandari et al., 2005).

The slow-acting pathway in the stress response is also known as the hypothalamic-pituitary-adrenal axis or the HPA axis. Just as it sounds, the hypothalamus releases CRH to the pituitary gland, which releases adrenocorticotropic hormone to the adrenal cortex of the adrenal gland, which releases glucocorticoids, most notably cortisol (Kolb & Whishaw, 2015, p. 169). The cortisol response can take minutes or hours to activate (Kolb & Whishaw, 2015, p. 169). Cortisol shuts down insulin production to increase circulation of sugars in the blood, increases availability of substances in the body to repair tissues in the event of injury, decreases immune response, and shuts down non-essential functions such as digestion, reproduction, and growth (Charmandari et al., 2005; Kolb & Whishaw, 2015, p. 169). Intercellular receptors for glucocorticoids are nearly ubiquitous throughout the body, and therefore cortisol acts on almost every organ and system within the body (Charmandari et al., 2005).

During a stress response, the body is subject to the impacts described above at the expense of normal bodily functions. This is why appropriate and timely deactivation of the stress response is crucial. There is a high density of cortisol receptors in the hippocampus which provides negative feedback to the hypothalamus about circulating cortisol levels which initiates deactivation of the stress response (Kolb & Whishaw, 2015, p. 170). However, the hippocampus is also highly susceptible to the impacts of cortisol and can become damaged over time by prolonged high levels of cortisol, reducing its ability to appropriately terminate the stress response (Kolb & Whishaw, 2015, p. 170; Shonkoff et al., 2012). Catecholamines, cytokines, and the hormones of the HPA axis are all mediators of allostasis and when the stress response is prolonged these hormones

overwhelm the system and can cause permanent damage (McEwan, 2005; Shonkoff et al., 2012).

Acute stress can be a good thing; it prepares your brain to face challenges and your body to respond to threat. However, when the stress response does not end, or becomes chronic, the hormones and neurotransmitters involved in the threat response begin to damage the body and the brain. This effect is particularly detrimental in the early years of life as the brain's structural and chemical patterns are still being established. As the stress response acts on all systems of the body, the long-term impacts of chronic stress are extensive and diverse.

Impacts of Stress on Physical Health

Stress has repeatedly been linked to increased risk of cardiovascular and respiratory diseases (Felitti et al., 1998; Iob & Steptoe, 2019; Manenschijn et al., 2013). Glucocorticoids trigger increases in heart rate, blood pressure, and cardiac output (Sapolsky et al., 2000). All of these physiological responses can help to save a person's life if they are faced with a life-or-death situation in which access to these physiological resources will help them to fight or flee. However, when these responses are repeatedly triggered in situations that do not require, or allow for, the use of the increased physiological capacity (ie: stressful work environments or child abuse) the body experiences wear and tear on sensitive systems. Elevated levels of cortisol over time can result in chronic high blood pressure and elevated heart rate putting undue pressure on arteries, veins, and cardiac muscles and elevating the risk of hypertension, heart attack, and stroke (American Psychological Association [APA], 2018).

Activation of the stress response increases respiration rate, and chronic activation of this system may overexert delicate lung tissue leading to damage (Charmandari et al., 2005). Chronic stress also exacerbates existing respiratory problems by increasing the severity of inflammatory responses to irritants, allergens, and infections (Chen & Miller, 2007). Stress has been shown to amplify immune responses leading to symptom severity in asthma (Chen & Miller, 2007) and individuals who have experienced chronic stress are at significantly increased risk of chronic bronchitis (Felitti et al., 1998). It seems likely that many of the effects of chronic stress on the respiratory system may be strongly mediated by immune and inflammatory responses triggered by dysregulation of glucocorticoids.

Glucocorticoids inhibit immune and inflammatory responses in the body. Prolonged activation of the stress response leads to prolonged elevated glucocorticoid levels which leaves the individual with a supressed immune system and subsequently susceptible to infection and disease (Charmandari et al., 2005; Flier et al., 1995). Anecdotally, this explains why people often report getting sick during stressful periods in their lives. Over time, however, hyperarousal of the adrenal glands through prolonged stress reactions can exhaust the adrenal glands and lead to hypoarousal and decreased glucocorticoid levels (Karr-Morse & Wiley, 2012). Hypoaroused adrenal activity results in an overactive immune system and leads to various autoimmune conditions such as lupus and rheumatoid arthritis, as well as type II diabetes, various allergies, fibromyalgia, and chronic fatigue syndrome (Black, 2003; Charmandari et al., 2005; Flier et al., 1995; Song et al., 2018; Stojanovich & Marisavljevich, 2008).

Another body system frequently affected by chronic stress response is the gastrointestinal system. Acute stress response downregulates digestion and appetite as CRH inhibits gastric secretion and emptying while also stimulating motor function of the colon (Charmandari et al., 2005). These functions serve in survival response to move resources away from non-survival-based digestion and stimulate the body to empty itself in order to focus all available resources on survival. However, this short-term response serves no long-term purpose, and is a dysregulation of typical, well-functioning digestive processes. Long term stress responses, therefore, dysregulate the digestive and gastrointestinal systems and chronic stress has been associated with the development of irritable bowel syndrome, chronic gastrointestinal pain, and various other functional gastrointestinal disorders (Charmandari et al., 2005; Mayer, 2000; Suarez et al., 2010).

In addition to the conditions discussed above, chronic stress has been shown to contribute to metabolic abnormalities; obesity; prevalence of health-compromising behaviours such as smoking, alcohol consumption, and risky sexual behaviours; exposure to sexually transmitted diseases, HIV, and hepatitis; and stroke (APA, 2018; Charmandari et al., 2005; Felitti et al., 1998; Maté, 2003). Chronic stress affects sexual desire, reproduction, and pregnancy outcomes (APA, 2018; Kolb & Whishaw, 2015, p. 169; Mulder et al., 2002). The stress response is crucial to an organism's survival, but over the long-term, being able to shut off an inappropriate stress response is just important as being able to activate it in the first place.

Impacts of Stress on Mental and Psychological Health

Prolonged activation of the stress response system has three main effects on the functioning of neural systems: degeneration (memory impairment), dysregulation

(depressive disorders), and sensitization (post-traumatic stress disorder, anxiety). Memory encoding involves an intricate dance between the amygdala and hippocampus that is facilitated by both catecholamines and glucocorticoids (McEwan, 2000b). Glucocorticoids enhance memory function on short term and emotionally driven tasks (Lupien & McEwan, 1997; Buchanan & Lovallo, 2001). However, prolonged elevated levels of cortisol have been shown to damage neurons in the hippocampus, and even decrease the size of the hippocampus overall (Kolb & Whishaw, 2015, p. 170; Lupien et al., 1998; McEwan, 2008; Shonkoff et al., 2012). Poorly regulated blood glucose, which can result from elevated levels of glucocorticoids, has also been associated with decreased hippocampal volume and poor memory function (McEwan, 2008). Hippocampal atrophy and impaired neurogenesis due to prolonged activation of the stress response impairs new memory formation and consolidation and can impact retrieval of previously formed memories. Chronic stress responses and prolonged exposure to glucocorticoids can have lasting impacts on memory systems.

Decreased hippocampal volume, hippocampal atrophy, and impaired functional connectivity in the hippocampus have been linked to major depressive disorder (Ahdidan et al., 2011; Cao et al., 2012) as has dysregulation of cortisol production and suppression (Ehlert et al., 2001). Smaller hippocampal volume during an acute depressive episode is associated with negative clinical outcomes and treatment resistant depression (Frodl et al., 2008; Gryglewski et al., 2018). However, studies have found that hippocampal volume can be recovered with certain treatments (ie: electroconvulsive therapy) and it often recovers to typical size with remission of depression (Ahdidan et al., 2011; Gryglewski et al., 2019). In addition to memory challenges and treatment resistant

depression, decreased hippocampal volume has been found in borderline personality disorder (Driessen et al., 2000), bipolar disorder (Cao et al., 2017), and may contribute to symptom severity in post-traumatic stress disorder (Gilbertson et al., 2002; Shin et al., 2006).

Post-traumatic stress disorder (PTSD) results from acute stress response to a traumatic event. Trauma can be defined as any experience that overwhelms the organism's capacity to cope. This makes trauma intensely personal as it depends on the individual's experiences, personality, and the sensitivity of their nervous system. Many people will experience traumatic events in their lives. However, not all individuals who experience trauma develop PTSD. There is significant evidence that early and/or chronic stressful experiences drastically increase the probability of developing PTSD following a traumatic experience (Gilbertson et al., 2002; Koenen et al., 2007; Ozer et al., 2003; Van Voorhees et al., 2012).

PTSD is characterized by memory dysfunction; psychological distress; physiological reactions to stimuli associated with the traumatic event; alterations in cognition, mood, arousal, and/or reactivity; and can be accompanied by depersonalization and/or derealization – cognitive detachment from oneself or one's surroundings (APA, 2013). Memory disruptions often include dissociation, or lack of memory; intrusive memories, such as flashbacks and nightmares; and/or physiological reactions to memories of the traumatic event. A hallmark of PTSD is the activation of physiological symptoms of an acute stress response (racing heart, shortness of breath, sweating, acute sense of terror or helplessness, and so on) in response to minute triggers or when the system is at rest. All of these symptoms of PTSD signal an acute dysregulation and

sensitization of the stress response system. Hypocortisolism, increased levels of CRH, heightened amygdala activity, and inhibited feedback along the HPA loop are associated with the symptoms of PTSD described above, and they are indicative of a dysregulated stress response system (Ehlert et al., 2001; Shin et al., 2006). The response system essentially becomes confused about what is safe and what is unsafe and even minute reminders of the traumatic experience (the sound of a siren, the smell of someone's cologne) can trigger the nervous system into a full-blown threat response accompanied by the cascade of physiological changes.

Hyperarousal of the HPA system, elevated levels of CRH, and hyperactivity of the amygdala are also highly associated with anxiety disorders (Charmandari et al., 2005; Korte et al., 2005; McEwan, 2000a). The amygdala is part of the limbic, or emotional, system in the brain and is involved in emotional processing and threat assessment. Benzodiazepine receptors in the amygdala are responsible for calming anxiety and stress reactions and early life stress has been shown to reduce the density of these receptors (Caldji et al., 1998). Both early life and chronic stress have been shown to cause hyperactivation and subsequent sensitization of the amygdala to potential threats (Caldji et al., 1998; McEwan, 2000a; Shonkoff et al., 2012). This creates a problematic feedback loop where the amygdala is sensitized to stress through chronic stress responses or diminished capacity to deactivate the stress response, it then responds inappropriately to mild stressors and causes a flood of neurochemicals that further sensitize the amygdala to perceived threat. It is as though the amygdala is involved in its own self-fulfilling prophecy: it perceives danger, causes a threat response to take place, perceives the stress

hormones as a confirmation that the body is indeed in danger and signals for continued activation of the stress response.

The pathway to addiction is complex and highly debated. It appears that there are genetic, epigenetic, social, cultural, and physiological components to addiction, and the field of addiction remains conflicted as to the direct pathway. However, there is one consensus: childhood trauma and toxic stress significantly increase an individual's risk of using substances and their risk of developing addiction (Felitti et al., 1998; Shonkoff et al., 2012; Teixeria et al., 2017; Zarse et al., 2019). For an overview of neurobiological pathways from early life stress to addiction, see al'Absi et al., 2021 and Roos et al., 2018.

Stress in Children

In developmentally healthy adults, stressors are varied, complex, and rooted in social and societal contexts. Adults have also developed a catalogue of experiences from which to assess the meaning of a stressor in the current context. For children, stressors are most likely to be experienced in the context of their close personal relationships and children do not possess the experience, or emotional and psychological development, to slow down their stress response to allow for contextual processing or assignment of meaning. Therefore, a child's stress response is highly dependent on their primary caregivers and immediate context for cues about safety and to provide the input necessary to assess the severity of stressors and turn off the stress responses once danger has passed. As children's emotional regulation systems are still developing, they need available, responsive adults to help them learn to regulate their stress responses.

The Center on the Developing Child at Harvard University describes three types of stress in childhood: positive, tolerable, and toxic stress (National Scientific Council on

the Developing Child, 2014). Positive stress initiates a mild to moderate, short-term response that results in minor changes to the child's physiology such as increases in heart rate and stress hormones. Positive stressors are experiences that are developmentally appropriate, which the child can learn to manage with the support of an adult, and occur within the context of safe, positive relationships. These stressors are an essential part of the normal development process and help the child develop skills for managing stress and provide their nervous system with experiences of turning on and off the stress response appropriately. Examples of positive stress are meeting a new friend, getting an immunization, going to a new place, or learning to deal with frustration.

Tolerable stress occurs when a child is exposed to a stressor that initiates a stress response that has the potential to disrupt the development of the brain but the stressful experience is short lived, allows the opportunity for the child's brain and nervous system to rest and recover following the stressful experience, and occurs against the backdrop of safe, responsive relationships. A responsive adult helps the child manage their stress response and provides a safe, secure context in which the child can recover from the stressor. Children are able to navigate more challenging stressors such as the loss of a friend or family member, or a natural disaster, if they are in relationship with a caring, responsive adult. If a significant stressor experienced by a child is not embedded in the context of safe, supportive relationships, the stress quickly becomes toxic.

Toxic stress occurs when children experience strong, frequent, or prolonged activation of the stress response system. This occurs when children face chronic, or significant stressors, or when they face moderate stressors without a safe, responsive relationship with an adult. Physical and emotional abuse and neglect produce toxic stress

responses in children. Other chronic stressors include poverty, living in a violent neighbourhood, or witnessing violence in the home. The presence of safe, supportive relationships is crucial to preventing chronic stress, and when the child's primary caregiver is mentally ill, abusing substances, or chronically stressed, the caregiver is emotionally and psychologically unavailable to help the child cope with and regulate their own stress response. This leaves the child isolated to endure their stress response and assign meaning to their experiences unmitigated by presence of a responsive adult.

Children's brains and nervous systems undergo rapid development and pruning during the early years of life and, as such, are particularly susceptible to the effects of stress. Prolonged or frequent experiences of stress sensitize the stress system to turn on faster, stay on longer, and be harder to shut off, while experiences of positive stress prepare the stress response system to manage stressors effectively and shut off appropriately. As a child's nervous system learns to rapidly assess and respond to threat in their environment, the neurobiology of their stress system is being developed and this lays the groundwork for behavioral and emotional regulation across the lifespan (Loman et al., 2009).

Children who experience high levels of stress which are unmitigated by either the cessation of the stressful environment and/or the presence of a stable, emotionally regulated adult are at increased risk for lifelong physical and mental health challenges. These children experience high rates of addiction, depression, and anxiety, and are at higher risk of attempting suicide; they are more likely to experience sexual trauma, intimate partner violence, and dysfunctional relationships in adulthood; and they have higher rates of memory impairments and emotional control disorders (Anda et al., 2006;

Felitti et al., 1998). Early life stress has been associated with decreased impulse control and increased substance use throughout the teen years and into adulthood (Dube et al., 2003; Felitti et al., 1998; Otten et al., 2019). Children who experience chronic stress are at increased risk for all of the physical and mental health challenges discussed above.

Intergenerational Transmission of Stress

The brain, body, and nervous system are programmed to analyze and adapt to experiences and environments in order to promote optimal functioning. This analysis and adaptation begin with the fetus in utero and continues throughout the lifespan. This adaptation involves a dynamic genetic and environmental interaction called epigenetics. Epigenetics serves to alter the individuals DNA and nervous system to prepare them for the specific environment in which they need to survive. Unfortunately, when threat exposure starts early, and/or continues chronically, our brains and bodies become primed to a threat response that can be difficult to turn off and leads to long term physical and psychological consequences.

Activation of the HPA axis and inflammatory responses have particularly significant effects during pregnancy, beginning with pregnancy outcomes. Effects of prenatal stress on pregnancy outcomes include low infant birth weight, increased risk of gestational diabetes, physical birth defects, and spontaneous abortion (Coussons-Read, 2013; Harris & Seckl, 2011; Mulder et al., 2002). Stress during pregnancy also appears to increase levels of proinflammatory cytokines that are associated with preeclampsia and preterm labour and delivery (Coussons-Read et al., 2005; Mulder et al., 2002).

There is significant evidence that high levels of maternal stress while a fetus is in utero alters gene expression in the offspring. One likely mechanism of this stress effect is

through glucocorticoids. Glucocorticoids play many important roles in fetal development including lung maturation, brain development, remodelling of axons and dendrites, and altering gene expression in various organs and systems (Harris & Seckl, 2011). The developing fetus is particularly sensitive to glucocorticoids, and the placenta expresses high levels of the enzyme 11ß-hydroxysteroid dehydrogenase type 2 (HSD2) which inactivates glucocorticoids (cortisol and corticosterone) to inert forms (cortisone and 11-dehydrocorticosterone) to manage the fetus' exposure to glucocorticoids (Harris & Seckl, 2011; Kajantie & Phillips, 2006). However, when a pregnant mother experiences high levels of stress, the HSD2 enzyme may not be able to keep up to the mother's cortisol production, and the fetus experiences higher levels of glucocorticoids leading to changes in development including altered gene expression.

Exposure to high levels of glucocorticoids in utero has been associated with higher blood pressure, higher insulin levels, increased distractibility and inattention, lower IQ scores, and abnormal or heightened sensitivity to stress (Harris & Seckl, 2011; Mulder et al., 2002; Weinstock, 2008). Prenatally stressed animals show hyperactive and prolonged responses to stressful stimuli, higher basal blood glucocorticoid levels, a reduced number of glucocorticoid receptors in the hippocampus, and structural changes in the hippocampus, frontal cortex, amygdala, and nucleus accumbens (Mulder et al., 2002; Weinstock, 2008). Prenatal stress has been linked to seizure disorders, major depressive disorder, attention deficit and hyperactivity disorder, anxiety disorders, and abnormal social behaviours (Clarke et al., 1996; Harris & Seckl, 2011; Kinney et al., 2008; Mulder et al., 2002). There is also evidence that significant stress in utero may be

associated with the development of autism spectrum disorder (Kinney et al., 2008) and schizophrenia (He et al., 2019; Levine et al., 2016).

A second mediator between maternal stress and fetal development is the catecholamines, adrenaline and noradrenaline. The placenta has adrenergic receptors and adrenaline and noradrenaline downregulate HSD2 in the placenta. This suggests that high levels of adrenaline and/or noradrenaline in the mother may alter placental functioning resulting in altered nutrition, increased exposure to glucocorticoids, altered gene expression, and altered glucocorticoid receptor density for the fetus (Harris & Seckl, 2011). Animal models have offered support to the theory of HSD2 downregulation as a mediator for maternal stress effects on offspring (O'Donnell et al., 2009).

Not all stressful life events lead to negative outcomes for offspring. There are many factors. Pregnant women's cognitive appraisal of an independent stressor has been shown to affect the methylation of the genome of their unborn children (Cao-Lei et al., 2015). That is, offspring of women who associate negative cognitive appraisals (thoughts, opinions, perceived stress) with the stressful event show significantly higher levels of methylation than do offspring of women who associate neutral or positive appraisals (Cao-Lei et al., 2015). Similarly, babies of mothers who developed PTSD after a stressful event showed lower salivary cortisol levels in the first year of life than did babies of mothers who were exposed to the same stressor but did not develop PTSD (Yehuda et al., 2005). This indicates that a mother's susceptibility to stress mediates her offspring's susceptibility to in utero stress exposure.

When children are born, they have a high reactivity to novelty and a limited capacity to tolerate and regulate their own stress responses. Parental care and attention

are essential for the development of emotional regulation. Children need safe, attuned, responsive caregivers in order to learn that the world is a safe, predictable place. Early maternal care serves to "program" the stress response in offspring, and sensitive, responsive maternal care can serve to buffer effects of prenatal stress. Offspring of mother rats who provide higher levels of attentive maternal behaviour (licking and grooming) show decreased sensitivity to stress and reduced fearfulness in comparison to offspring of rats who provide low levels of maternal care (Caldji et al., 1998; Liu et al., 1997). Maternal care in rats has been associated with decreased adrenocorticotropic hormone and corticosterone responses to acute stress and decreased levels of hypothalamic CRH receptor density in the locus coeruleus (Caldji et al., 1997; Liu et al., 1997). Maternal attention has been related to the expression of numerous genes that are associated with how offspring will respond to stress in adulthood (Szyf & Bick, 2013).

When parents are overwhelmed, experiencing chronic stress, or suffering from mental illness, they are often unable to provide the safe, secure relational foundation that children need. When a primary caregiver is undergoing a chronic stress response, their nervous system is experiencing the world as an unsafe, threatening place. The infant's nervous system, in attuning with the primary caregiver's nervous system, then also experiences that the environment is unsafe and also that the caregiver is unable to protect them from the danger.

Sex Differences in Stress Response

Males and females respond to the physiological effects of stress differently. Studies show increased blood pressure and catecholamine responses in men, compared to increased heart rate variability and lower HPA axis activation and autonomic responses in

women (Kajantie & Phillips, 2006). Interestingly, the sex disparities in stress response and stress related disease mortality are not present prior to puberty, and drop significantly after menopause (European Society of Human Reproduction and Embryology [ESHRE], 2006; Kajantie & Phillips, 2006), and women's physiological response to stress varies greatly throughout the menstrual cycle (Goldstein et al., 2010), suggesting a significant mediating influence of estrogen. Estrogen stimulates production of corticosteroid-binding globulin which binds to free circulating cortisol rendering it metabolically inactive (Kajantie & Phillips, 2006). Sex differences in stress responsiveness impact the risk of stress-related disease: males are at significantly higher risk for cardiovascular disease and infectious diseases, while women are at higher risk for autoimmune diseases, somatic disorders, and stress-related mental illness such as depression (Bangasser & Valentino, 2014; ESHRE, 2006; Kajantie, 2008). However, as further evidence for the mediation of estrogen in stress response, the variance in cardiovascular mortality between men and women drops significantly post-menopause (ESHRE, 2006). It has been suggested that the protective aspects of the female stress response serve an evolutionary purpose in protecting the developing fetus (Kajantie & Phillips, 2006).

Resilience

Stressful environments and experiences do not always lead to negative outcomes – in fact, more often than not, children develop capacity for resilience that allows them to overcome adverse experiences and thrive later in life. Resilience is a complex interplay between biological, psychological, social, and cultural risk factors and protective factors that determine how one responds to stressful experiences (Southwick et al., 2014). Resilience does not occur in the absence of risk or adverse events. Resilience occurs

when an individual, family, or community is able to access and utilize protective factors to cope with adversity and achieve positive outcomes. As individuals and families, and the environments in which they live, are dynamic, resilience can be thought of as a process, rather than an outcome.

Resilience develops over time, through experience, and as an interactional process with one's environment (Khanlou & Wray, 2014). An individual may thrive in some conditions, where they are able to access and utilize their resources well, while in another environment, the individual may not be equipped with the right protective factors for the circumstances. Many resilience factors also exist on a continuum between risk and resilience (Benzies & Mychasiuk, 2009). For example, low socio-economic status is a risk factor for adverse outcomes, while high socioeconomic status is a factor in resilience. There are many resilience factors discussed in literature across a multitude of disciplines (for a review see Benzies & Mychasiuk, 2009 and Khanlou & Wray, 2014). For the purposes of this review, resilience factors that contribute to decreasing or overcoming stress will be discussed.

Internal Resilience Factors

Temperament. Temperament is used to refer to an individual's predisposed emotional and behavioural response to environmental stimuli and remains relatively stable over the course of the lifespan (Chess & Thomas, 1977; Lee et al., 2020). "Easy" temperaments appear to buffer the effects of disability and early adversity and increase positive social engagements (Benzies & Mychasiuk, 2009). Optimism, considered to be an aspect of temperament, has been shown to promote physical and mental health outcomes, appears to play a role in cognitive reappraisal (Averill et al., 2021), and has

been linked to lower levels of perceived parenting stress (Peer & Hillman, 2014). Pessimism and behavioural inhibition may increase the sensitivity and reactivity of the stress response as the individual tends toward negative cognitive appraisal. Extraversion and gratitude have also been linked to resilience (Averill et al., 2021).

Epigenetics. The development of a healthy stress system begins in utero, and even prior to conception (Keenan, 2018). As discussed above, stress in utero affects gene expression and methylation, as does early parental care (Averill et al., 2021; Caldji et al., 1998; Cao-Lei et al., 2015; Harris & Seckl, 2011). Enhancing resilience from a developmental view starts with ensuring healthy conditions for development (Southwick et al., 2014). This involves ensuring that pregnant women have access to health care, safe housing, and other basic needs to reduce stress associated with the necessities of life. It also means supporting families in the early years of children's lives to prevent early adversity and toxic stress thus allowing children's stress systems to develop in healthy ways. A healthy human brain has tremendous capacity to learn, cope, and overcome adversity. Providing the brain with a solid foundation through healthy pregnancy and supportive relationships in the early years is vital to resilience throughout the lifespan.

Locus of Control and Self-Efficacy. A sense of, and belief in, one's own abilities and available resources has a significant impact on how well the individual is able to respond to stressful events (Benzies & Mychasiuk, 2009; Lazarus & Folkman, 1984). Attentional control refers to the ability to reevaluate one's initial reaction, and direct attention away from acutely stressful stimuli or internal stress responses toward more positive stimuli or parts of the situation which are under the individual's control. Both cognitive reappraisal and attentional control have a significant effect on moderating

and downregulating the emotional and neurobiological aspects of the stress response (Averill et al., 2021; Berjot & Gillet, 2011; Cao-Lei et al., 2015; Lazarus & Folkman, 1984).

Early development of self-control or inhibitory control, including the capacity to delay gratification and persevere through challenges, plays a role in the development of resilience (Averill et al., 2021). Self-control indicates a level of top-down, or cognitive, control over the stress response system, whereby the prefrontal cortex is able to inhibit and/or regulate the stress response in a way that allows for continued optimal functioning in the face of stressful stimuli. In addition to moderating the stress response, self-control leads to lower levels of substance use and promotes better physical and psychosocial health outcomes throughout the lifespan (Averill et al., 2021).

Another important aspect of self-efficacy is motivation. The motivation system is involved in seeking behaviour and desire. Dysregulation of this system is highly implicated in the development of addiction and some depressive behaviours (Koob, 2013; Koob & Le Moal, 2001; Martin-Soelch, 2009; Wise, 1996). The motivation/reward system is also a powerful force in resilience (Averill et al., 2021; Southwick et al., 2014). Desire is one of the primary motivators of behaviour, and having goals one wants to achieve, a sense of purpose in life, or things to look forward to activates the reward system in the brain which is a powerful driver of goal-directed behaviour. Long-term goals are not relevant to immediate survival and consequently, chronic stress is often accompanied by a lack of ability or desire to think about a positive future. Activation of motivational systems and goal-directed behaviour is a resilience resource that can

downregulate the stress response through cognitive reappraisal of current circumstances in the context of future goals or desires.

Meaning-making involves making sense one's experiences and locating those experiences in the greater context of themselves, their community, or their life story. The ability to create a clear, coherent autobiographical narrative is significantly related to positive outcomes following significant stress or trauma (Harvey et al., 1998; Jelinek et a., 2009; van der Kolk, 2014). Humans are a story-telling, meaning-making species and being able to tell the story of our experiences clearly, and make meaning out of what has happened to us is a powerful determinant of resilience (Southwick et al., 2014). Neurobiologically, meaning-making and narrative construction counteracts the chaotic memory formation often experienced as a result of extreme or prolonged stress by promoting memory integration and consolidation.

Emotional Regulation and Coping. Emotional regulation is necessary for self-control, delayed gratification, and developing positive social relationships (Benzies & Mychasiuk, 2009). Emotional regulation involves being able to modulate one's emotional responses to external stimuli. Positive stress exposure in the early years involving experiences that the child perceives to be predictable, manageable, and controllable promotes resilience by offering the stress system a chance to practice turning on and off appropriately and builds the child's sense of capabilities and confidence for overcoming future stressful experiences (Averill et al., 2021). These mild to moderate stress experiences have an "inoculating" effect on future stress when compared to individuals or animals who experience extreme stress and those who experience minimal to no stress (Averill et al., 2021).

Coping skills and coping style have been shown to mediate the relationship between objective stressors and perceived stress (Benzies & Mychasiuk, 2009; Peer & Hillman, 2012). Peer and Hillman (2014) found that parents who used problem-solving coping strategies aimed at resolving the problem experienced significantly less parenting stress than did parents who used emotion-focused strategies aimed only at getting through the current situation, but not addressing the root problem. Coping styles are intricately related to cognitive appraisal and self-efficacy, and may be somewhat related to temperament.

One of the areas of overlap between temperament, genetics, and emotional regulation is nervous system sensitivity and sensitivity to external stimuli. Sometimes referred to as highly sensitive persons, there is a population of individuals who respond with higher sensitivity to external stimuli, including sensory stimuli as well as emotional and interpersonal cues (Aron & Aron, 1997; Smolewska et al., 2006). Sometimes referred to as sensory-processing sensitivity, this level of high sensitivity can be a relational strength in that these individuals are often highly empathetic, emotionally intelligent, and relationally intuitive. However, highly sensitive people can also be highly relationally reactive and have been shown to experience higher levels of perceived stress in response to lower levels of objective stressors, perceive more stressors overall, and suffer more health consequences in relation to perceived stress than those individuals who are not highly sensitive (Benham, 2006; Yano et al., 2019).

External Resilience Factors

Family Relationships. High-quality marital and parent-child relationships are significant protective factors and resilience resources (Benzies & Mychasiuk, 2009).

Positive relationships within the home model appropriate and positive social interactions for children. Marital strain creates stress and undermines well-being, particularly for women, while strong positive marital relationships buffer stress in various areas of life (Thomas et al., 2017). Positive parent-child relationships have been shown to buffer the impacts of negative life events as well as the impacts of parental stress on children (National Scientific Council on the Developing Child, 2014; Tharner et al., 2012).

Attachment. Safe, stable home environments contribute to a sense of safety, thus providing the child with an environment in which their stress response can rest, turn off, and regulate. Positive, responsive parent-child relationships are the foundation of secure attachment. Secure attachment in childhood establishes a neurobiological sense of safety in relationships and promotes positive biopsychosocial outcomes (Ranson & Urichuk, 2008). Secure attachment also creates the foundation for children to seek relationship for safety and coregulation when faced with stress and challenge throughout their lives.

Social Support. Relationships provide a profound sense of emotional security and safety in the face of danger or adversity through co-regulation (Southwick et al., 2014). Being near someone else who's nervous system is regulated can cue the nervous system of the stressed individual that the environment is safe which downregulates the stress response. Positive social support is also associated with the release of the hormone oxytocin which inhibits the amygdala by dampening the cortisol response to stress and subsequently reducing anxiety and fear (Averill et al., 2021). Quality of relationship is more important to resilience than quantity of relationship and the individual's perception of social support determines the impact of the social relationships on resilience (Averill et al., 2021; Peer & Hillman, 2014).

In relationship, humans also promote resilience through active communication. In intergenerational societies and diverse communities, knowledge is shared and passed down, regarding what helps, what works, and what does not work when it comes to various types of adversity (Southwick et al., 2014). There is great power in having someone with experience come alongside during a difficult time and share wisdom about how to cope with and move through the experience. For example, a parent offering advice to a teenager who is experiencing rejection for the first time, or a woman who has lost her mother experiencing support from a friend who has been through the experience. In different cultures, this passage of wisdom, expertise, and support may come from elders, therapists, support groups, religious leaders, family, neighbours, or friends.

Socioeconomic Factors. Safe stable income, adequate housing, safe neighbourhoods, and access to quality education and health care are all protective factors that promote resilience (Benzies & Mychasiuk, 2009). Lack or loss of each of the above factors can cause acute stress responses (APA, 2019; Ehlert et al., 2001; Wilkinson & Marmot, 2003; World Health Organization [WHO], 2014). Ensuring that families have their basic needs met so that children are not exposed to unhealthy, unsafe environments or undue parental stress due to preventable factors, is crucial in promoting resilience in society.

Physical Activity

Physical activity helps to regulate the HPA axis, dampens cortisol response, promotes neurogenesis, and increases concentration of mood boosting hormones such as dopamine, serotonin, and endorphins (Averill et al., 2021). Regular physical exercise, especially during stressful periods and for children in developmentally sensitive periods

can have a significant positive effect on regulating the stress response and moderating levels of stress-related hormones.

Neuroplasticity and Remodelling

In addition to protective factors, neuroplasticity is an important consideration in development, stress, and resilience. Neuroplasticity allows for the stress response to become sensitized, as seen above, especially in childhood. However, many of the negative impacts of stress on the brain are reversible. Atrophy and dendritic remodelling in the hippocampus have been found to be reversible in both human and animal studies (McEwan, 2000b) and electroshock therapy can increase volume and connectivity of the hippocampus (Gryglewski et al., 2019). Short-term and spatial memory deficits from stress are reversible (McEwan, 2000b); development of coherent memory narratives supports recovery from PTSD (van der Kolk, 2014); and safe and responsive relationships have a significant effect on mitigating and/or reversing the effects of chronic stress and trauma throughout the lifespan (Averill et al., 2021; Shonkoff et al., 2012; Thomas et al., 2017).

Social Isolation

Strong, positive social relationships are the greatest factor in promoting resilience throughout the lifespan. Human beings rely on social relationships for physical, mental, psychological, and emotional health (Holt-Lunstad, 2017). Therefore, impeding access to social connections causes distress and impairments in functioning (Holt-Lunstad et al., 2015; Loades et al., 2020). Social isolation is a cyclical risk factor: isolation triggers a stress response while the most significant protective factor against stress – human relationship – is absent, thus exacerbating the level of stress.

Pandemics, Epidemics, and Quarantine Measures

For centuries, quarantine and isolation measures have been used to stop the spread of disease (Tognotti, 2013). Isolation and quarantine serve different purposes in contagious disease response. Isolation refers to separating an individual who is known to be infected from the general public, while quarantine refers to separating an individual with a known exposure to a contagious disease prior to development of symptoms or confirmation of infection (Centers for Disease Control and Infection, 2017). The Centers for Disease Control and Infection (CDC) in the United States maintains a list of communicable diseases for which there is standing legal authority for isolation and quarantine. This list includes cholera, smallpox, measles, yellow fever, and severe acute respiratory syndromes among others (CDC, 2021).

Quarantine and isolation are restrictive measures with potentially devastating consequences for individuals, communities, and economies. However, for the purposes of public health protection, these measures are sometimes required. When considering implementation of quarantine and isolation measures, there are many ethical and legal considerations that must be taken into account (Gostin et al, 2003). Research during and after previous epidemics has found significant mental health effects associated with the use of quarantine including distress, PTSD symptoms, depressive symptoms, avoidance behaviours, increased substance use and dependence, and other markers of high prolonged stress response such as irritability, poor concentration, and sleep disturbances (Brooks et al., 2020; Hawryluck et al., 2004; Jalloh et al., 2018; Reynolds et al., 2008). Epidemics utilizing quarantine measures have also been shown to increase the prevalence and impacts of gender based and domestic violence (John et al., 2020; Peterman et al.,

2020). Previous research has found that negative effects of quarantine begin to occur after only a few days in isolation (Reynolds et al., 2008) and the impacts of epidemics endure for years – particularly for marginalized populations (Power, 2020).

The Covid-19 Pandemic

Several aspects of the Covid-19 pandemic in general and the public health responses in particular create conditions likely to induce stress responses in individuals and families. First and foremost, Covid-19 poses an actual threat to life, and with mass media avidly covering every aspect of the pandemic, including death tolls, case numbers, and ever-changing symptom classifications, frightening and confusing information was hard to avoid or ignore. The reality of an emerging pandemic is that science takes time to catch up and the symptoms, incubation period, route of transmission, and recommendations for public safety changed rapidly and frequently in the initial months. The human nervous system relies on past experiences to detect threat, and continued uncertainty about what is safe and what expectations we must follow, often leads to anxious stress responses due to the lack of historical or concrete experience upon which to rely.

Public health measures requiring social distancing and social isolation removed a primary resilience factor from day-to-day life. In the face of adverse experiences, communities often band together to support one another and find their way through. In the Covid-19 pandemic, the very human instinct to seek out and rely on relationship was also the pathway to risk and disease. This not only removes a primary resilience factor, but also creates a dissonance between the instinct to relate and be close to others in times of distress and the necessity of staying apart for physical safety. The Covid-19 pandemic

also created conditions for stress in many other areas. People lost their jobs, were required to cancel or put on hold future plans, and were required to postpone or forego major cultural milestones such as birthdays, weddings, and funerals. Childcare and schools were closed and parents suddenly had to reorganize their lives, without the social support on which they would usually rely.

Many factors contribute to the levels of stress faced by families prior to the pandemic, and many more will compound that stress moving forward. Existing resilience factors, family structure, socioeconomic status, and compounding risk factors will impact the overall stress that individuals and families face. Understanding the significance of various factors and how experiences interact is crucial to developing policy and interventions both during the remainder of the Covid-19 pandemic and in future pandemics.

The Current Study

The Covid-19 pandemic has created unprecedented situations for everyone – parents being one of the most significantly impacted groups. The purpose of this study is to explore experiences of parents during the Covid-19 pandemic. Parents face unique challenges during this time including loss of institutional, accessible childcare (including schooling); stress within relational family dynamics; and the addition of schooling as a task to be taken on by already overwhelmed parents (Power, 2020). This study will seek to identify what risk and protective factors are most significantly impacting parental stress levels, which stress behaviours are most prevalent in the population during ongoing social isolation, and whether there are correlations between parent and child stress-related behaviours.

Theory

This study is guided by the theory of psychological stress pioneered by Lazarus and Folkman in 1984, whereby, "psychological stress is a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (p. 19). This study will examine a wide range of stress and resilience variables along with a measure of overall stress to determine how stressful experiences and resilience resources are interacting during the Covid-19 pandemic. This study will focus on parent stress as children are particularly vulnerable to stress and parent stress levels significantly impact children's stress responses and healthy development.

Research Questions

Based on previous research on stress, resilience, social isolation, and previous use of quarantine and a current understanding of the conditions of the Covid-19 pandemic, the research questions for this study are as follows:

- How are parents coping with the Covid-19 pandemic?
    - What elements are reported as the most stressful?
    - What elements are contributing to increased or decreased levels of overall stress?
- How is stress manifesting behaviourally in parents and their children?

Hypotheses

I expect to find increased levels of overall stress in parents both cross-sectionally and over time. I expect to find that variables related to relationships will be the strongest correlates to overall stress followed by variables related to safety, stability, and control. I

expect to find increases in stress-related behaviours in parents from pre-Covid to the time of the survey, and I anticipate a strong correlation between levels of stress behaviours seen in parents and their reports of behaviours exhibited in their child(ren).

Ethical Considerations

The surveys used in this study collected sensitive data and care was taken to ensure that responses remain anonymous. No identifying information was collected, informed consent was obtained through the survey platform (see Appendix 1 and 2 for informed consent letters), and all data was stored in the Google Forms database prior to being downloaded into an excel document where no identifiers were attached to the responses. All questions were optional and participants could exit the survey at any time. The surveys were hosted on Google Forms which has a stringent security policy that is approved by the University of Lethbridge Office of Research Ethics. The Covid-19 Parent Isolation Study asked for postal codes to allow for disaggregation of the data based on geographical location. The Covid-19 Parent Stress and Resilience Study only asked for the first three digits of the postal code as it was determined that this was sufficient for disaggregation and location purposes. Both surveys offered an opportunity to enter a draw for a gift card as incentive to complete the survey. Emails associated with the draw were kept separate from the data by inviting participants to email Building Brains Together directly rather than collecting emails through the survey platform. Participants were not required to complete the survey to enter the draw so that no coercion applied. This study was reviewed and approved by the University of Lethbridge Human Participant Research Committee.

Chapter 2: Covid-19 Parent Isolation Study

If our society were truly to appreciate the significance of children's emotional ties throughout the first years of life, it would no longer tolerate children growing up, or parents having to struggle, in situations that cannot possibly nourish healthy growth.

Stanley Greenspan and Beryl Lieff Benderly (1998)

Methods

The Covid-19 Parent Isolation Study (CPIS) was conducted between May 8 and June 15, 2020. At the time of the study, public health measures in Alberta included social distancing, work from home orders, and closure of schools, restaurants, recreational services, non-essential medical services, and personal care and wellness services (Office of the Chief Medical Officer of Health [OCMOH], 2020a, 2020b, 2020d). Immediately preceding the release of this survey, on May 4, 2020, non-essential medical services were allowed to reopen under strict policies and conditions (OCMOH, 2020e), and on May 14, 2020, daycares, restaurants, non-essential businesses, and personal and wellness services were provided permission to reopen under strict guidelines (OCMOH, 2020f, 2020g). However, these amendments were not applicable in areas experiencing high case volumes or active outbreaks such as Calgary and Brooks, Alberta (OCMOH, 2020f).

Participants

Participants were recruited using online platforms and contact networks through the University of Lethbridge and community partners in the Lethbridge area. Current and previous participants of research through the Brain in Action Laboratory at the University

of Lethbridge were contacted through email with an invitation to complete the surveys (recruitment email can be found in Appendix 3). The Building Brains Together working group – a group of professionals and academics in the Lethbridge area – also distributed the surveys through their email and contact networks. Some of the agencies involved in distributions of the surveys include the Lethbridge Early Years Coalition, Lethbridge College, Holy Spirit Catholic School Division, Lethbridge School Division, Lethbridge Immigrant Services, the YMCA in Lethbridge, and the Family Centre in Lethbridge. Links to the surveys were also posted on the Building Brains Together website and distributed through their social media channels on Facebook and Instagram (social media call-out template can be found in Appendix 4). The overwhelming majority of responses came from within Alberta (n = 422), nine participants responded from Saskatchewan, one from the Northwest Territories, and eight participants did not disclose their postal code.

A total of 460 individuals responded to the survey; however, 20 respondents answered "no" to the question "Are you currently caring for children?" and were removed from analysis leaving a final total of 440 participants. Ages of participants ranged from 22 to 68 years old with an average of 37.5 years. The sample was overwhelmingly Caucasian[1] (n = 357) and female (n = 399). Participants in this study collectively represented over 925 children ranging in age from newborn to 21 years old (dependent adult children) with an average child age of 7.7 years. The number of children in each household ranged from one child to six children with an average of 2.2 children per household. Table 1 depicts detailed characteristics of participants in this study.

[1] Participants were asked to self-identify their ethnicity. Caucasian was the most commonly used language and will therefore be the language used in the study.

Table 1

Characteristics of CPIS Participants

	n (*N* = 440)	%
Age (y)		
18-25	11	2.5
26-35	185	42.0
36-45	186	42.3
46-55	39	8.9
56-65	8	1.8
66+	2	0.5
Missing	9	2.0
Gender		
Female	399	90.7
Male	36	8.2
Non-binary	3	0.7
Missing	2	0.5
Ethnicity		
Caucasian	357	81.1
Indigenous	10	2.3
Ethnically diverse populations[a]	20	4.6
Missing	53	12.0
Age of children in the family[b]		
Infant (birth to 12 months)	53	12.0
Toddler (1-2 years)	88	20.0
Preschool (3-5 years)	246	55.9
School age (6-12 years)	391	88.9
Teen (13-18 years)	143	32.5
Adult dependent (19+ years)	6	1.4
Number of children in the family		
1	94	21.4
2	214	48.6
3	73	16.6
4	26	5.9
5+	13	3.0
Missing	20	4.5
Relationship to child(ren)		
Parent	429	97.5
Extended family care: grandparent, aunt, uncle, in-laws	11	2.5
Missing	0	0.0
Caregiving dynamics		
Living full time with partner and child(ren)	370	84.1
Shared custody with child(ren)'s other parent	18	4.1
Single parent caring for child(ren) full time	37	8.4
Working out custody arrangement	2	0.5
Caring for someone else's child(ren)	9	2.0
Full time parenting while partner works away from home	4	0.9

[a]Asian, Chinese, Filipino, Latino/a, Hispanic, Pakistani, Middle Eastern, multiracial. [b]Some families may be represented in more than one category due to multiple children in the household.

Survey Design

The aim of this study was to describe parent experience during the Covid-19 pandemic; and more specifically, to identify what factors were contributing to parents' stress levels and what factors were acting as protective, or resilience factors. This study employed an online, anonymous, self-report survey. Online surveys have demonstrated significant strengths in quick and widespread data collection (Evans & Mathur, 2005) and there is evidence that online surveys result in lower incidence of social desirability responding and fewer blank items and item refusals (Nayak & Narayan, 2019).

As the Covid-19 pandemic was unprecedented, the CPIS included a broad range of questions about parents' experiences with and responses to the Covid-19 pandemic. The measures in this survey were designed based on indicators of psychological outcomes from previous epidemic and quarantine research (Blendon et al., 2004; Hawryluck et al, 2004; Reynolds et al., 2008), existing stress and resilience research (Peer & Hillman, 2014), existing social isolation research (Global Council on Brain Health, 2017), and psychosocial determinants of health (Wilkinson & Marmot, 2003; World Health Organization, 2014). The full CPIS survey can be found in Appendix 5.

Measures

Demographics. This survey included basic demographic questions such as age, ethnicity, gender identity, relationship status, and housing situation. Each of these demographic variables has been linked to variations in mental and physical health outcomes by the WHO (2014). Participants were asked about both their own and their partner's (if applicable) employment status and whether employment had been impacted by Covid-19. Unemployment has been linked not only to financial stress and poverty and

the associated negative health outcomes, but also to both physical and psychological health effects including anxiety, depression, risk of cardiovascular disease, and premature death (Wilkinson & Marmot, 2003). Due to the increased risk of Covid-19 on medically vulnerable populations, participants were asked to identify if someone in their household was immunocompromised or living with a chronic illness or significant disability.

Parenting. Many variations in family configuration have been associated with differences in levels of perceived parenting stress. Some of these variables include single parenting (Östberg et al., 1997), divorce and custody disputes (Buchanan & Jahromi, 2008; Turkat, 2000), perceived social and marital support (Parkes et al., 2015; Sepa et al., 2004), partner relationship quality (Bouchard & Lee, 2000; Thomas et al., 2017), child-parent relationship quality (Esdaile & Greenwood, 2003; Magill-Evans & Harrison, 2001), and time spent together as a family (Flouri & Buchanan, 2003; Halme et al, 2006). Participants in this study were asked both to identify their parenting situation: living full time with partner and child(ren), shared custody with child(ren)'s other parent, caring for someone else's child(ren), single parent caring for child(ren) full time, working out custody arrangement, foster parent, or other. Participants were also asked to rate on a five-point scale (from "significantly decreased" to "significantly increased") how Covid-19 had impacted the amount of time they spend with their children and with their partner (if applicable), and how much time their partner spends with the child(ren).

Community Supports. During initial phases of the Covid-19 public health response, community resources, wellness services, and many other businesses and supports were required to immediately cease all in-person provision of services and stop operating altogether if they were not able to provide virtual services. Some of these

resources included schools and child care providers (OCMOH, 2020a), recreational and community activities (OCMOH, 2020b), and "non-essential health services" which are defined as "any service that is generally done to protect, promote or maintain health of an individual" (OCMOH, 2020d, p.2). Social relationships and community support, including recreational activities, child care, and support groups, can have a significant impact on the well-being of individuals and families (Global Council on Brain Health, 2017; Wilkinson & Marmot, 2003). Additionally, access to social services, community supports, and preventative and/or maintenance interventions (chiropractors, massage therapy, dentists, etc.) has been shown to have significant positive effects on health outcomes and contribute to lower long term public health spending (Bradley, et al., 2016; Frieden, 2010). School and daycare closures necessary to promote physical distancing to prevent the spread of the Covid-19 pandemic put additional strain on families, to juggle both employment, child care, and often care of other relatives. This unpaid care work, which disproportionately relies on the resources of women, has been linked to poorer physical and mental health outcomes across the lifespan (United Nations Secretary General, 2020).

A list of community, health, and wellness resources were included in this survey and participants were asked to identify which resources they had been utilizing prior to the pandemic and had lost access to during lockdowns. Participants were then asked which of these lost resources most significantly impacted their family. The survey also included questions about changes in type and frequency of social interactions for both participants and their child(ren). At the end of the survey, participants were invited to select from a checklist of resources and services that they would find helpful at this time.

This question was included to provide clarity and direction to professional agencies working with families during the pandemic.

Stress. Stress variables in this survey were designed to target several psychosocial determinants of health such as economic security (finances, employment, housing security, personal education), social relationships (partner, parents, children, social isolation), and unpaid care work (parenting, care for elderly relatives, child(ren)'s education) (Wilkinson & Marmot, 2003; United Nations Secretary General, 2020; WHO, 2014). Participants were asked; "How much are each of the following adding to your stress during this time of isolation?" and then provided with each factor to rate on a five-point scale from "no stress" to "extreme stress." Participants were provided with a second set of items and asked to determine "How worried are you about the following during this time of isolation?" on a four-point scale from "not at all worried" to "very worried." These questions were modeled after a survey being conducted by the Canadian government at the same time of this survey (LaRochelle-Côté & Uppal, 2020) and included family violence, addiction within the family, personal health, health of family members, access to food/medications, access to other essential items (ie: diapers, formula, medical supplies, etc.), and ability to care for my child(ren). As the outcome measure for stress, participants were asked to rate their current level of stress on a scale of 1 (not at all stressed) to 10 (extremely stressed). This number was used to assess how other variables related to overall stress.

Resilience. Resilience questions were modeled after existing resilience scales (Connor & Davidson, 2003; Ponce-Garcia et al., 2015; Wagnlid & Young, 1993) as well as common categories often attributed to supporting resilience such as community

involvement, strong relationships, personal agency, access to resources, flexibility, and self-awareness (Luthar & Cicchetti, 2000; Peer & Hillman, 2014). Resilience questions were phrased as statements and participants were asked to respond to each resilience factor individually on a five-point scale from "strongly disagree" to "strongly agree." Participants were also asked to rate how isolation had impacted the time their family spends playing together from "significantly decreased" to "significantly increased" as play has been shown to be a contributor to both a personal and relational well-being (Nijof et al., 2018; Yogman et al., 2018).

Qualitative Measures. Three qualitative questions were included at the end of the survey asking participants to identify what they were finding most challenging about isolation, what they were finding most rewarding, and a space to offer any other insights into the impacts of isolation on themselves and/or their families. These questions were included due to the novelty of the Covid-19 response with the understanding that parents might articulate aspects of their experience that were integral and had been overlooked in the quantitative data.

Analysis

Means, standard deviations, and percentages were calculated for demographic variables as appropriate. T-tests were used to determine if there were variations in stress levels between groups with two categories (ie: households with an individual who was immunocompromised) and analysis of variance was used in those cases with three or more categories (ie: parenting status). Correlational analysis examined the relationship between stress variables, parenting variables, and resilience variables. Exploratory factor analysis (EFA) is used on novel data sets to determine the underlying factor structure

where there is little historical data to support a predetermined factor structure (Hair et al, 2009). Variables coded as stress variables and those coded as resilience variables were subjected to EFA to identify latent factor structures in this data set. All quantitative data analysis was done using IBM SPSS Statistics (Version 22.0).

Results

Demographics

Age had a small but significant negative correlation to current stress levels, r = -.124 [-0.220, -0.026], p = .013, such that as age increased, reported stress level decreased. Gender was analysed as an independent samples t-test between self-identified males and females due to the small number of non-binary respondents (n = 3). There was no significant effect of gender on current stress level in this study, $t(398) = 0.648$, p = .517, d = 0.109, suggesting that men (M = 6.33, SD = 2.29) and women (M = 6.56, SD = 1.93) were reporting similar levels of stress. A one-way analysis of variance showed that there was no significant effect of ethnicity on current stress levels, $F(2, 356) = 0.90$, p = .408, ω^2 = -.001.

Independent samples t-tests were conducted to determine whether living in a household with someone in a vulnerable health category had any impact on current stress levels or levels of stress or worry associated with health-related variables. Living in a household with an individual who had a significant disability, chronic illness, or immunocompromised status (yes or no) were each analyzed as independent variables. Outcome variables included: current stress level, level of worry regarding one's own health, level of worry regarding the health of one's family members, level of worry regarding access to food and medications, level of worry regarding access to other

essentials, and level of stress associated with caring for elderly relatives. None of the household health vulnerability variables were significant in relation to current stress levels (Table 2); however, living in a household with someone with a health vulnerability showed significant effects on some individual health-related stress variables (Table 2).

Table 2

Comparison of Current Stress Levels and Health-Related Stress Variables Among Participants with Household Members in Vulnerable Health Categories

	Yes		No				
Household Health Vulnerability	*M* (*n*)	*SD*	*M* (*n*)	*SD*	*t*(DF)	*p*	*d*
Current Stress Level[a]							
Significant disability	6.9 (37)	1.9	6.5 (367)	1.9	-1.13(402)	.257	0.20
Chronic illness	6.7 (82)	1.9	6.5 (322)	1.9	-1.09(402)	.276	0.13
Immunocompromised	6.6 (74)	2.2	6.5 (330)	1.9	-0.25(402)	.800	0.04
How worried are you about your own health?[b]							
Significant disability	2.5 (41)	1.0	2.2 (398)	0.8	-1.66(46.05)	.102	0.28
Chronic illness	2.5 (92)	0.9	2.1 (347)	0.8	-3.07(437)	.002	0.35
Immunocompromised	2.4 (83)	1.0	2.2 (356)	0.8	-1.58(112.38)	.117	0.20
How worried are you about the health of you family members?[b]							
Significant disability	2.7 (41)	1.1	2.3 (396)	0.9	-2.06(46.04)	.044	0.36
Chronic illness	2.7 (92)	0.9	2.3 (345)	0.9	-3.15(435)	.002	0.37
Immunocompromised	2.7 (83)	1.0	2.3 (354)	0.9	-3.91(435)	< .001	0.46
How worried are you about access to food/medications?[b]							
Significant disability	1.9 (41)	0.9	1.7 (393)	0.8	-1.56(432)	.117	0.24
Chronic illness	1.9 (91)	0.9	1.6 (343)	0.8	-2.46(432)	.014	0.28
Immunocompromised	1.9 (82)	0.9	1.6 (352)	0.8	-2.49(432)	.013	0.29
How worried are you about access to other essentials (ie: diapers, formula, medical supplies)?[b]							
Significant disability	1.7 (41)	0.9	1.6 (396)	0.8	-1.23(435)	.217	0.19
Chronic illness	1.8 (91)	0.9	1.5 (346)	0.8	-3.09(435)	.002	0.35
Immunocompromised	1.8 (83)	0.8	1.5 (354)	0.8	-2.47(435)	.014	0.30
How much is caring for elderly relatives adding to your stress during isolation?[c]							
Significant disability	2.1 (14)	1.2	1.8 (192)	1.1	-0.79(204)	.426	0.20
Chronic illness	2.1 (42)	1.3	1.8 (164)	1.1	-1.20(204)	.231	0.20
Immunocompromised	2.4 (44)	1.3	1.7 (162)	1.0	-3.11(57.08)	.003	0.56

Note: Household health vulnerability could refer to any member of the household.
[a]Mean is based on a ten-point scale from not at all stressed to extremely stressed. [b]Means are based on a four-point scale from not worried at all to very worried. [c]Means are based on a five-point scale from no stress to extreme stress.

Employment

Of the participants in this study, 79.7% reported being employed in some capacity prior to the implementation of the Canadian Covid-19 pandemic public health measures on March 16, 2020. At the time of this survey, 37.2% reported that their employment had been impacted in some way by Covid-19 and 35.2% reported that their partner's employment was impacted in some way. A total of 16.6% of participants reported that both their and their partner's employment had been impacted. Only 30.9% of participants reported "no" when asked if they anticipated further employment impacts due to Covid-19. Full employment characteristics for this study can be found in Table 3.

Table 3

Characteristics of Employment for CPIS Participants and Their Partners

Employment Variable	*n* (*N* = 440)	%
Were you employed prior to March 16, 2020?		
Full time	210	47.7
Part time	86	19.5
Contract	7	1.6
Self-employed	48	10.9
Student	14	3.2
Laid off in the three months prior to March 16	1	0.2
Not employed	74	16.8
Missing	0	0.0
Has your employment and/or income been impacted due to Covid-19?		
My hours were reduced	38	8.6
I was laid off	62	14.1
I was self-employed and my income potential has been reduced	20	4.5
I was self-employed and am no longer generating income	27	6.1
My hours have increased	17	3.9
My employment status remains the same (previously employed)	204	46.4
My employment status remains the same (previously unemployed)	69	15.7
Missing	3	0.7
Do you anticipate Covid-19 to further impact your employment?		
No	136	30.9
Yes	143	32.5
Unsure	138	31.4
N/A	23	5.2

Employment Variable	*n* (*N* = 440)	%
Missing	0	0.0
If married/common law, has your partner's employment been impacted due to Covid-19?		
My partner's hours were reduced	41	9.3
My partner was laid off	34	7.7
My partner is self-employed and their income potential has been reduced	40	9.1
My partner is self-employed and they are no longer generating income	10	2.3
My partner's hours have increased	30	6.8
My partner's employment status remains the same	230	52.3
Not applicable*	55	12.5
Missing	0	0.0

*These responses were removed from further analysis of how partners' employment impacted participants' stress levels.

To assess participant employment impacts, those participants who identified being unemployed prior to March 16, 2020 were excluded from the analysis as the intent was to determine impacts for those who were employed. A one-way analysis of variance (ANOVA) showed that participant employment impacts had a significant effect on current levels of stress, $F(5, 331) = 3.02$, $p = .011$, $\omega^2 = .03$. A planned contrast was performed to compare participant stress in all employment impact categories to participants whose employment remained the same. Post hoc analyses were conducted to determine differences between employment impact categories and were done using the Games-Howell procedure due to unequal variances between groups. The planned contrast revealed that having experienced any employment impact significantly increased current stress levels compared to maintaining pre-Covid-19 employment status, $t(198.61) = 3.41$, $p < .001$, $r = 0.21$. Post hoc tests indicated current stress levels were significantly higher for those participants who reported being laid off ($M = 7.1$, $SD = 1.7$), $p = .034$ and for participants who reported having their hours reduced ($M = 7.2$, $SD = 1.4$), $p = .028$ than for those participants who reported that their employment status remained the same as

prior to Covid-19 (M = 6.3, SD = 2.1). There were no other significant differences between categories of employment impacts.

A one-way ANOVA was also conducted on partners' employment and showed similar impacts on current stress as participants' employment. Partners' employment changes had a significant impact on participants' current levels of stress, $F(5, 346) = 5.80$, $p < .001$, $\omega^2 = .06$. A planned contrast was performed to compare all participants who had partners whose employment status had changed due to Covid-19 with those whose partners' employment remained the same. Post hoc analyses were conducted using the Bonferroni correction to determine differences between employment impact categories. The planned contrast revealed that having a partner experience any employment impact significantly increased current stress levels compared to participants whose partners maintained pre-Covid-19 employment status, $t(346) = 4.66$, $p < .001$, $r = 0.28$. Post hoc tests indicated current stress levels were significantly higher for those participants whose partners had been laid off (M = 7.6, SD = 1.8), p = .002 and for participants who reported that their partner's hours had increased (M = 7.5, SD = 1.5), p = .004 than for those participants who reported that their partner's employment status remained the same as prior to Covid-19 (M = 6.1, SD = 2.0). There were no other significant differences between categories of employment impacts.

Parenting

Children in this study ranged from new born to a 21-years old (dependent adult child), with an average child age of 7.7 years. As the majority of participants reported more than one child in the household (n = 327), a composite number was created for each family to represent the age of children in the household. In Alberta, child care is

legislated and staffed based on a ratio system of children to caregivers such that younger children need more caregivers for smaller group sizes than do older children. These ratios can be converted to a point system to ensure correct numbers of caregivers for mixed ages of children. For this study, the composite child age score was based upon Alberta's requirements for caregiver to child ratio in regulated child care settings (Early Learning and Child Care Regulation, 2008). Slight alterations were made to the ratios as most participants listed their children's ages in years rather than months. The full conversion can be found in Table 4.

Table 4

Child Care Ratios in Alberta and Child Point Number Assigned to Represent Age

Alberta Child Care Age Range	Age Range used for Children in this Study	Ratio of Adult Caregivers to Children	Point Number Assigned for Analyses
Less than 12 months	Less than 12 months	1:3	3.3
12 months to less than 19 months	12 months to less than 19 months	1:4	2.5
19 months to less than 3 years	24 months to less than 3 years	1:6	1.7
3 years to less than 4 years	3 years to less than 5 years	1:8	1.3
4 years and older	5 years and older	1:10	1.0

Early Learning and Child Care Regulation, Alberta Regulation 143/2008. *Early Learning and Child Care Act*, SA 2007, c E-0.1.

Each participant was assigned a point number based on the age and number of children in their household. There was a significant negative correlation between point number assigned to represent age of children in the household and current stress levels, $r = -.20$ [-.295, -.103], $p < .001$. There was also a small but significant negative correlation

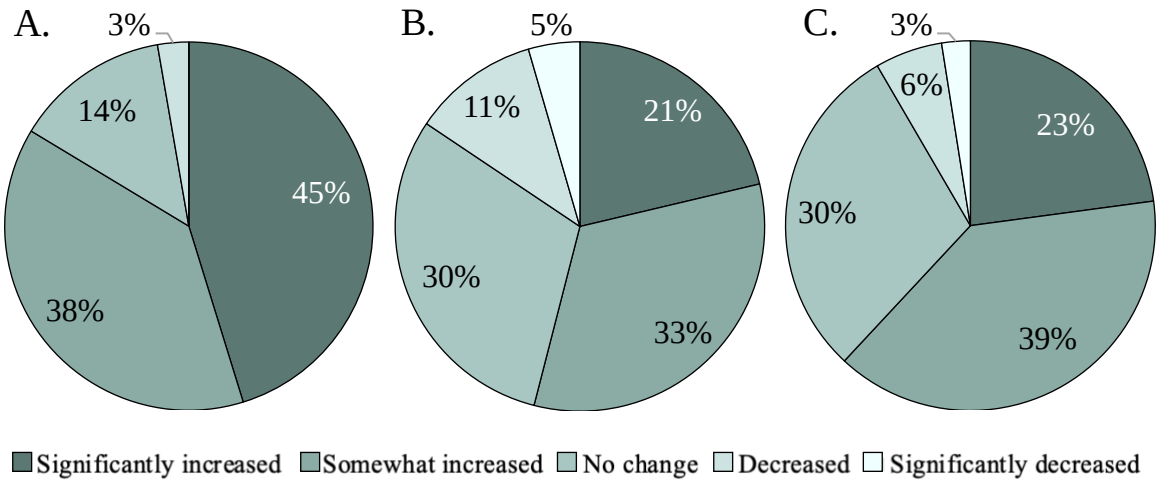
between number of children in the household and stress level, r = -.20 [-.287, -.095], p <.001, such that having more children was correlated with lower levels of stress.

When asked to describe their parenting situation, 79.7% of participants identified that they were living full time with their partner and child(ren), 8.0% reported that they were a single parent caring for their child(ren) full time, 3.9% reported shared custody, 1.9% were caring for someone else's child(ren), 0.9% reported that their partner works away from home for days or weeks at a time, and 0.4% reported that they were working out a custody arrangement. For the purpose of assessing impact of parenting situation on stress level, those respondents who were working out custody (n = 2) and those whose partners were working away (n = 4) were excluded from the analysis of variance due to low response rate. The one-way analysis of variance revealed that there was no significant effect of parenting situation on current stress levels, $F(3, 395) = 0.30$, p = .827, ω^2 = -.01.

Social isolation measures enacted to prevent the spread of Covid-19 significantly altered people's typical ways of life and this impacted how much time they spent with their family members and other members of their households. Participants reported significant increases in the time they spent with both their partners and child(ren) as well as the amount of time their partner (if applicable) was spending with the child(ren) (Figure 1). Changes in the amount of time that participants were spending with their children had a small negative correlation to current stress levels, r = -.10, p = .048, such that as time with ones' child(ren) increased, reported stress level increased. Neither time spent with partner (r = -.07, p = .096), nor partner's time spent with children (r = -.06, p = .126) were significantly correlated with current stress.

Figure 1

Impacts of Isolation on Time with Child(ren), Time with Partner, and Partner's Time with Child(ren)



Note: Pie chart A: Distribution of participant responses to the question, "How has isolation impacted the amount of time you spend with your child(ren)?" Pie chart B: Distribution of participant responses to the question, "How has isolation impacted the amount of time you spend with your partner?" Pie chart C: Distribution of participant responses to the question, "How has isolation impacted the amount of time your partner spends with your child(ren)?"

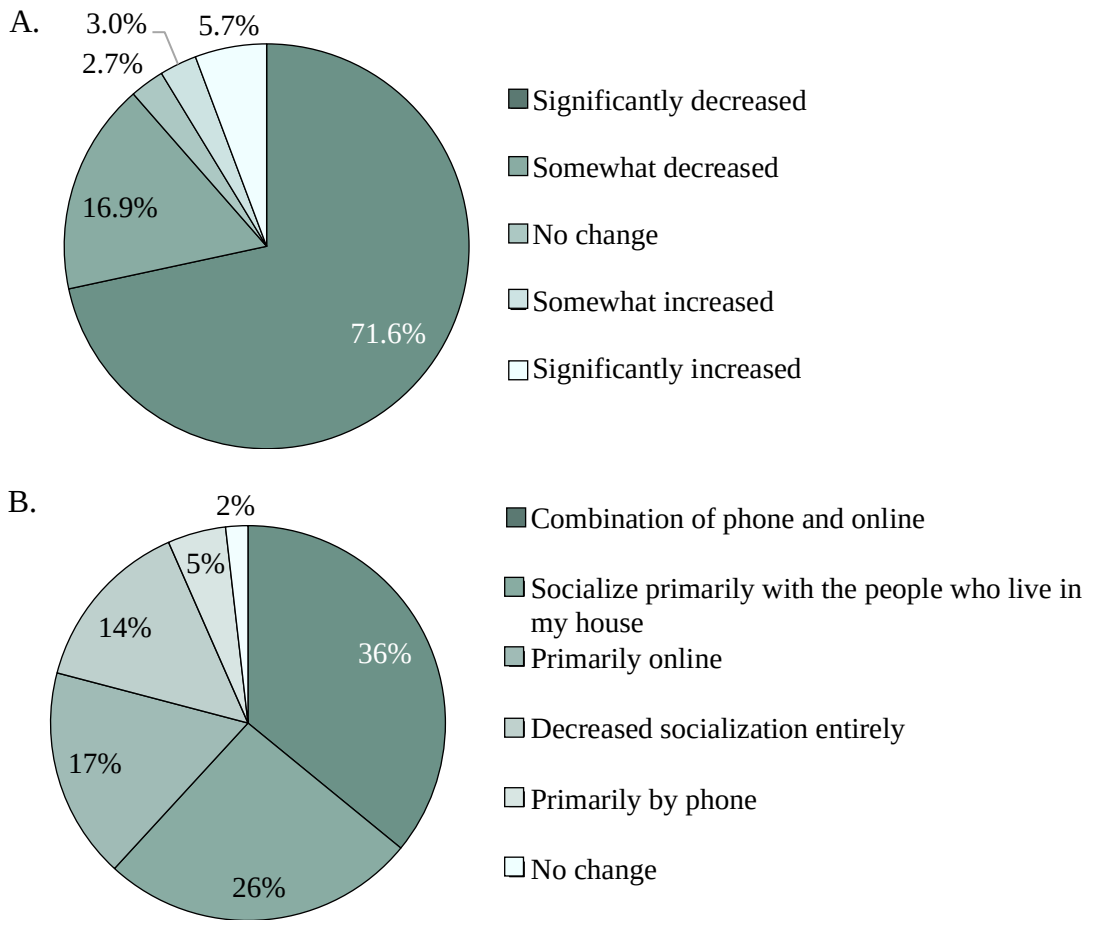
Community Supports

Public health measures had significant impacts on both the amount of time that people spent socializing with others, and the way in which this socialization took place. Participants overwhelmingly reported decreases in socialization outside of the household with 89% reporting that isolation measures decreased or significantly decreased the amount of time they spent socializing with people who lived outside their home, 9% reporting that outside socialization had increased or significantly increased, while only 3% reported no change. There was no significant correlation between changes in time spent socializing outside of the household and overall stress, r = -.05, p = .284. Respondents also reported significant changes in the way they socialize with others with

only 2% reporting no changes to the types of socialization they engage in. Full distributions for amount of time spent socializing with others outside the household and types of social interactions can be found in Figure 2.

Figure 2

Changes to Social Interactions During Covid-19 Public Health Measures



Note: Pie chart A: Distribution of participant responses to the question, "How has isolation impacted the amount of time you spend socializing with people who do not live in your home?" Pie chart B: Distribution of participant responses to the question, "How has isolation impacted the way that you socialize with others?"

Schools were closed during the administration of this survey (OCMOH, 2020a), with children being expected to engage in school primarily online with significant parental guidance and support. Participants were asked to identify if they were attempting to provide this homeschooling for their children. Of the 328 participants who responded to this question and had school-aged children (between the ages of five and eighteen), 89.0% reported that they were currently attempting to homeschool their children and 11.0% reported that they were not attempting schooling at home.

In addition to the closure of schools, recreation centres, community supports and services, and "wellness" services were also required to cease operation, or transfer all their programming to online, virtual programming (OCMOH, 2020a, 2020b, 2020d). High numbers of participants reported losing access to supports and services that they had been accessing regularly prior to the implementation of Covid-19 public health measures. Specifics for different supports and services can be found in Table 5. In addition to the options given in the survey, which are listed in Table 5, participants also noted school supports, arenas and ice rinks, physiotherapy, speech therapy, English language programs, libraries, music lessons, mommy and me groups, children's play groups, church or faith communities, and provincial parks as supports or resources that they had been accessing that were no longer available to them. When asked which resources closures most impacted their family, the most frequently named was access to parks and playgrounds, followed by kid's activities, sports, and community centers and play places. Only three participants reported that they did not experience any significant impacts from the closure of resources. Aside from the resources listed, participants noted significant impacts from lost medical benefits, loss of access to medications, closure of

mom and baby groups and new parenting groups, closure of provincial parks, and loss of speech therapy and English language courses. A list detailing frequency of responses for the most impactful resource losses can be found in Table 5.

Table 5

Supports and Services That Participants Lost Access to During Covid-19 Public Health Measures and Most Impactful Resource Closures

	n	%
Which resources were you accessing regularly that you have lost access to due to isolation?		
Family Resources		
Kid's activities	361	82.0
Family to family socializing	338	76.8
Informal childcare	174	39.5
Formal childcare	173	39.3
Family support groups	69	15.7
Housekeeping/cleaning services	63	14.3
Children's counselling	44	10.0
Family counselling	37	8.4
In home support services	33	7.5
Respite supports	26	5.9
Mental Health Resources		
Individual counselling	79	18.0
Support groups	50	11.4
Access to medication	24	5.5
Group counselling	13	3.0
Physical Health Resources		
Access to parks	376	85.5
Swimming pool	330	75.0
Dental	319	72.5
Kids play places	306	69.5
Sports	247	56.1
Massage	235	53.4
Gym access	225	51.1
Chiropractor	175	39.8
Dance classes/gymnastics	91	20.7
Acupuncture	57	13.0
Of the supports and services above, which losses have most significantly impacted your family?[a]		
Gyms, sports, dance classes, gymnastics, swimming pools	125	32%
Access to parks	109	28%
Kid's activities	82	21%
Formal childcare, informal childcare, school, school supports	66	17%
Access to libraries, community centers, play places	57	15%
Physical health services (chiropractor, massage therapy, physiotherapy, acupuncture, dental)	54	14%
Socializing and social supports (family, friends, community), church or faith communities	53	14%
In home supports, respite services, mental health supports, counselling	18	5%

[a]Responses to this question have been combined into categories based on type of resource due to significant overlap in responses

Frequencies were calculated for each of the supports and resources that participants selected as potentially beneficial to their families at the time of the survey. There was significant overlap between what participants reported their families would benefit from and those supports and resources that they reported losing access to during public health closures. The list of resources and participant responses can be found in Table 6.

Table 6

Resources Participants Identified Would be Beneficial to Their Families

Which of the following resources would you and your family would benefit from at this time?	*n*	%*
Play activities for kids	303	80%
Physical activities for kids that can be done in small spaces	243	64%
Educational activities for kids	220	58%
Games that can be played in small spaces	193	51%
How to support kids who are doing school at home	167	44%
Mental health supports for myself	157	41%
Play activities for adults	148	39%
Mental health supports for my child(ren)	137	36%
Resources for creating a routine	83	22%
Information on child development	79	21%
Educational activities for adults	66	17%
Mental health support for other adults in my home	66	17%
Food assistance	27	7%
Assistance with government forms	13	3%
Addictions resources	13	3%
Access to family violence support	2	1%

*Percentages calculated using the number of participants who responded to the question (n = 380).

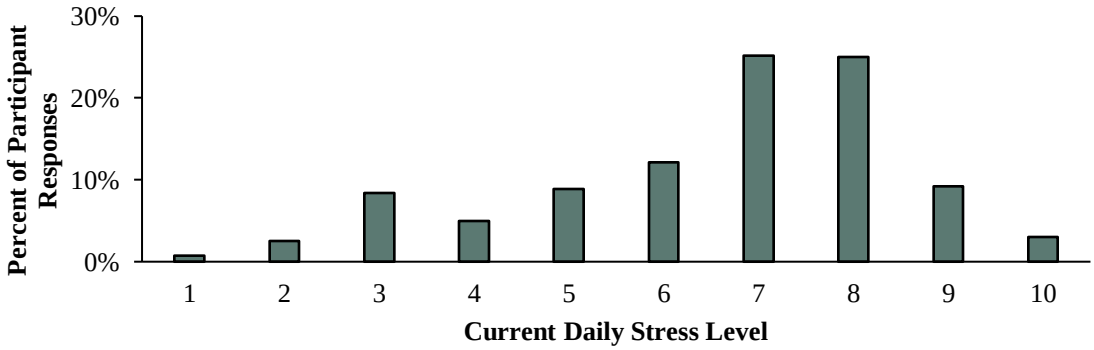
Stress

Participants were asked to rate their current stress level on a scale from one (not at all stressed) to ten (extremely stressed) and to identify how Covid-19 had impacted their daily stress on a five-point scale from significantly decreased to significantly increased.

Participants reported high levels of current stress with 62.4% reporting a stress level between seven and ten, 26.0% reporting a stress level between four and six, and 11.6% reporting a stress level between one and three (see Figure 3 for full distribution of reported stress levels). Participants overwhelmingly reported that Covid-19 had increased or significantly increased their daily stress (90.7%) and only 3.6% of respondents reported no change to their daily stress levels (Figure 4).

Figure 3

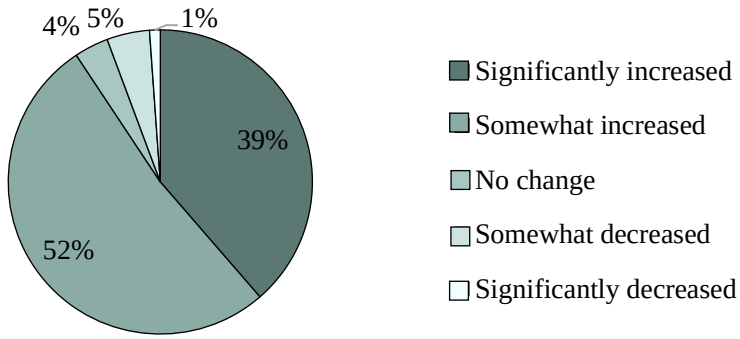
Distribution of Current Stress Levels



Note: Distribution of participant responses to the question, "Please rate your current stress level?"

Figure 4

Impacts of Covid-19 on Daily Stress Levels

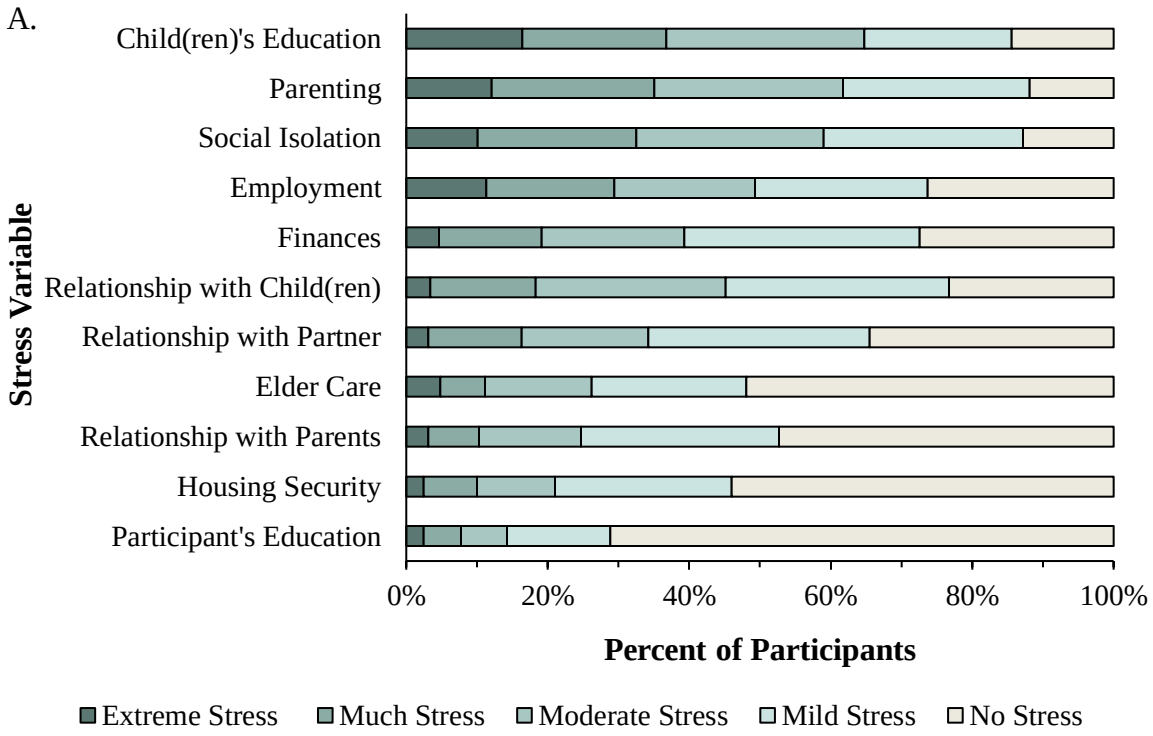


Note: Depicts distribution of participant responses to the question, "How has Covid-19 Impacted Your Daily Stress?"

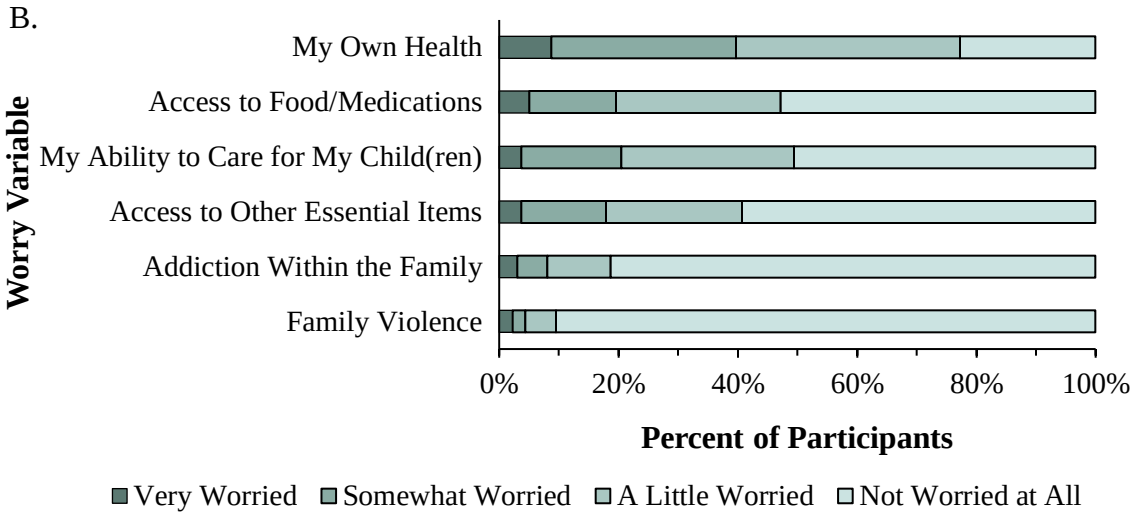
Of the eighteen questions coded as stress variables in this survey, eleven questions asked about stress and seven asked about worry. Child(ren)'s education was reported to be adding the most stress for parents (M = 3.0, SD = 1.3), followed by parenting (M = 3.0, SD = 1.2), and social isolation (M = 3.0, SD = 1.2). The variable reported to be causing the most worry was participant's own health, (M = 2.3, SD = 0.9), followed by access to food and medications (M = 1.7, SD = 1.0). The full distribution of responses for stress variables can be found in Figure 5.

Figure 5

Distribution of Responses to Stress Variables CPIS



B.



Note: Panel A: Distribution of participant responses to the question, "How much are each of the following adding to your stress during this time of isolation?" for each of the associated variables. Panel B: Distribution of participant responses to the question, "How worried are you about the following during this time of isolation?" for each of the associated variables.

Correlations were conducted to determine relationships between stress variables and current stress levels. All stress variables showed statistically significant correlations to current stress. Two variables had correlation coefficients indicating a moderate-large relationship with current stress: parenting ($r = .56$, $p < .001$) and relationship with my child(ren) ($r = .55$, $p < .001$). Demographics full correlation matrix for stress variables can be found in Table 7. Independent samples t-tests were conducted to determine if there was an effect of gender on any of the stress variables, with gender as the independent variable and each stress variable as a separate outcome measure. Only one variable, elder care stress, shower a small but significant effect of gender, $t(11.60) = 2.19$, $p = .050$, suggesting that men ($M = 2.9$, $SE = 0.5$) were reporting higher levels of stress associated with caring for elderly relatives than were women ($M = 1.8$, $SE = 0.1$).

Table 7

Descriptive Statistics and Correlations for Stress Variables CPIS

Stress Variable	*n*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Current Stress[a]	404	6.6	2.0	—									
2. Finances[b]	412	2.4	1.2	.434***	—								
3. Housing Security[b]	409	1.8	1.1	.361***	.699***	—							
4. Participant Education[b]	322	1.5	1.0	.245***	.227***	.329***	—						
5. My Child(ren)'s Education[b]	403	3.0	1.3	.446***	.208***	.224***	.285***	—					
6. Relationship with My Partner[b]	386	2.2	1.1	.426***	.315**	.296**	.252**	.235**	—				
7. Relationship with My Parents[b]	389	1.9	1.1	.301***	.195***	.197***	.174**	.254***	.353***	—			
8. Relationship with My Child(ren)[b]	416	2.4	1.1	.545***	.204***	.201***	.230***	.439***	.474***	.317***	—		
9. Social Isolation[b]	415	2.9	1.2	.453***	.185***	.203***	.249***	.310***	.326***	.307***	.504***	—	
10. Employment[b]	381	2.6	1.3	.458***	.446***	.419***	.400***	.320***	.269***	.354***	.352***	.335***	—

Stress Variable	*n*	*M*	*SD*	1	11	12	13	14	15	16	17	18	19
1. Current Stress [a]	404	6.6	2.0	—									
11. Parenting[b]	413	3.0	1.2	.555***	—								
12. Caring for Elderly Relatives[b]	206	1.9	1.2	.200**	.345***	—							
13. Family Violence[c]	434	1.2	0.6	.131**	.079	.243***	—						
14. Addiction Within the Family[c]	434	1.3	0.7	.129*	.150**	.265***	.580***	—					
15. My Own Health[c]	439	2.3	0.9	.459***	.373***	.234**	.191***	.277***	—				
16. Health of My Family Members[c]	437	2.4	1.0	.398***	.318***	.359***	.134**	.237***	.639***	—			
17. Access to Food and Medications[c]	434	1.7	0.9	.252***	.238***	.515***	.177***	.235***	.352***	.375***	—		
18. Access to Other Essentials[c]	437	1.6	0.9	.232***	.183***	.352***	.157**	.201***	.322***	.352***	.734***	—	
19. Ability to Care for My Children[c]	435	1.7	0.9	.401***	.416***	.158*	.188***	.178***	.439***	.351***	.313***	.286***	—

[a]Range = 1-10 [b]Range = 1-5 [c]Range = 1-4

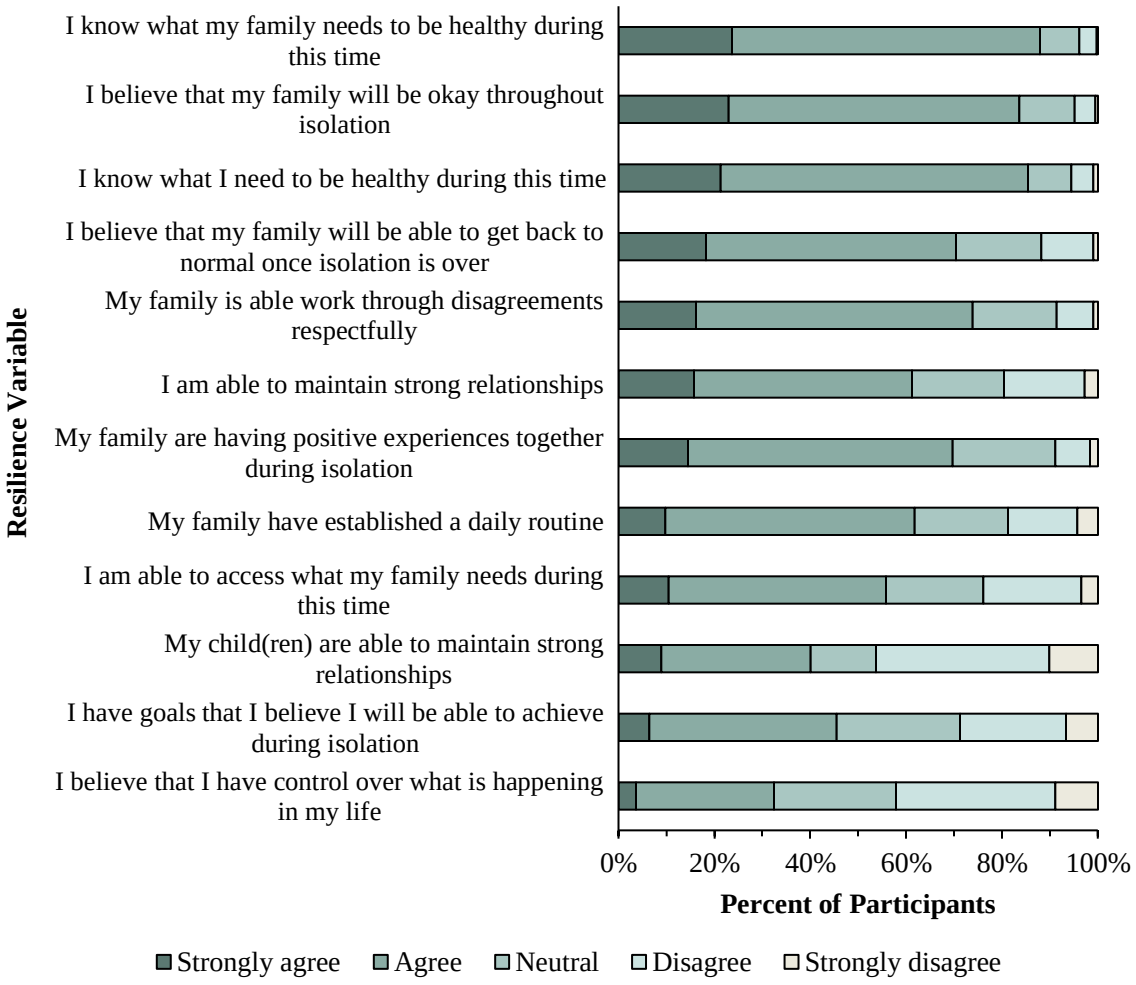
*p < .05. **p < .01. ***p < .001.

Resilience

Twelve questions were coded as resilience variables in this survey. The full distribution of responses for resilience variables can be found in Figure 6.

Figure 6

Distribution of Responses to Resilience Variables CPIS



Note: Distribution of participant responses to the resilience variables. Participants were presented with a statement and asked to respond on a five-point scale from strongly agree to strongly disagree.

Correlations were conducted to determine relationships between resilience variables and current stress levels. None of the resilience variables showed statistically significant correlations to current stress. One variable, "I believe that I have control over what is happening in my life," was approaching significance, $r = .10$, $p = .051$. Demographics for resilience variables can be found in Table 8 and correlations for current stress and resilience variables can be found in Table 9. Independent samples t-tests were conducted to determine if there was an effect of gender on any of the resilience variables, with gender as the independent variable and each resilience variable as a separate outcome measure. There was no statistically significant effect of gender on any of the resilience variables.

Table 8

Descriptive Statistics for Resilience Variables CPIS

	n	*M*	*SD*
1. Current Stress [a]	404	6.6	2.0
20. I am able to maintain strong relationships with the important people in my life during isolation [b]	439	2.5	1.0
21. My child(ren) are able to maintain strong relationships with the important people in their lives during isolation [b]	436	3.1	1.2
22. My family have established a daily routine [b]	439	2.5	1.0
23. I believe that I have control over what is happening in my life [b]	440	3.2	1.1
24. My family are having positive experiences together during isolation [b]	440	2.3	0.9
25. I have goals that I believe I will be able to achieve during isolation[b]	439	2.8	1.1
26. My family is able work through disagreements respectfully [b]	440	2.2	0.8
27. I believe that my family will be okay throughout isolation b	440	2.0	0.8
28. I believe that my family will be able to get back to normal once isolation is over [b]	439	2.2	0.9
29. I know what I need to be healthy during this time [b]	440	2.0	0.8
30. I know what my family needs to be healthy during this time [b]	440	1.9	0.7
31. I am able to access what my family needs during this time [b]	439	2.6	1.0

[a] Range = 1-10 [b] Range = 1-5

Table 9

Resilience Variable Correlations to Current Stress Levels

Variable	1	20	21	22	23	24	25	26	27	28	29	30	31
1	—												
20	.028	—											
21	.058	.546***	—										
22	.049	.139**	.230***	—									
23	.097	.302***	.373***	.305***	—								
24	.030	.318***	.261***	.270***	.359***	—							
25	.035	.234***	.342***	.316***	.386***	.461***	—						
26	.049	.220***	.133***	.199***	.178***	.349***	.228***	—					
27	.058	.323***	.289***	.201***	.316***	.477***	.365***	.488***	—				
28	.065	.256***	.224***	.152**	.288***	.166***	.195***	.312***	.398***	—			
29	.013	.205***	.109*	.267***	.240***	.218***	.356***	.205***	.254***	.318***	—		
30	.008	.204***	.138**	.234***	.228***	.226***	.313***	.192***	.279***	.345***	.828***	—	
31	.043	.272***	.287***	.212***	.367***	.336***	.368***	.198***	.371***	.268***	.366***	.376***	—

*p < .05. **p < .01. ***p < .001.

Although there were no significant correlations between current stress levels and resilience variables, there were statistically significant correlations between stress variables and resilience variables. Six resilience variables showed statistically significant correlations to parenting stress, most notably between parenting stress and the participant's belief that their family will be okay throughout isolation, $r = .13$, $p = .007$. Three resilience variables showed statistically significant correlations to worrying about access to essentials, two variables to each of financial stress and worry about addiction in the family, and one variable each to social isolation stress, stress related to caring for elderly relatives, worry about the health of participant's family members, and worry about accessing food and medication. Full correlation details are listed in Table 10.

Table 10

Significant Correlations Between Stress Variables and Resilience Variables

Variable	2	9	11	12	14	16	17	18
20	-.020	.123*	.125*	-.017	-.094*	-.045	-.024	-.032
21	.077	.084	.116*	-.036	-.085	.017	.062	.025
23	.054	.070	.103*	-.051	.047	.038	.022	.044
25	.039	.057	.113*	-.140*	-.071	-.070	-.006	.012
26	.029	.026	.105*	.067	-.020	-.071	.011	-.019
27	.050	.079	.132**	-.014	-.023	-.086	.032	.005
29	.109*	.040	.027	-.075	-.098*	-.056	.044	.105*
30	.111*	.023	-.011	-.098	-.051	-.104*	.027	.104*
31	.063	.035	.057	-.057	-.006	-.015	.098*	.100*

*$p < .05$. **$p < .01$. ***$p < .001$.

A univariate analysis was conducted to determine whether there was an interaction effect between stress variables and resilience variables. Stress variables and resilience variables were averaged into a composite stress score (worry variables were

adjusted to a five-point scale) and a composite resilience score for each participant. Participants were then assigned to a low, moderate, or high stress category and a low, moderate, or high resilience category based on their composite score (1.0-2.5 = low, 2.5-3.5 = moderate, 3.5-5.0 = high). There was a significant main effect of stress category on current stress level, $F(2, 394) = 23.39$, $p < .001$, $\eta^2 = .11$. Bonferroni post hoc tests revealed that current stress was significantly higher in moderate stress group than low stress group ($p < .001$) and in the high stress group compared to the low stress group ($p < .001$). There was no significant difference in current stress between the moderate and high stress groups ($p = .110$). There was no significant effect of resilience category on current stress level, $F(2, 394) = 0.38$, $p = .684$, $\eta^2 = .00$, and there was no significant interaction effect between stress and resilience categories on current stress levels, $F(4, 394) = 0.51$, $p = .730$, $\eta^2 = .01$.

When asked how isolation impacted the amount of time that the family spends playing together 72.3% of participants reported that the time spend playing as a family had increased or significantly increased, 11.4% reported that this time had decreased or significantly decreased, and 16.4% reported that their family play time had not changed (Figure 7). There was a small significant negative correlation between family play time and current stress, $r = -.12$, $p = .007$, such that as family play time increased, reported levels of current stress decreased.

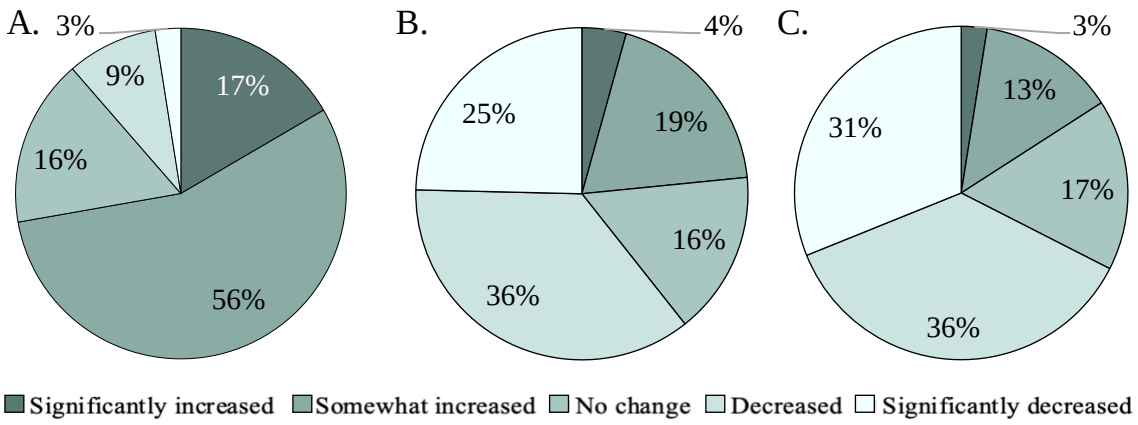
Over half of the respondents in this study, 60.6%, reported that isolation had resulted in decreased or significantly decreased daily physical activity for them, 23.4 % reported that their daily physical activity had somewhat or significantly increased, and 15.9% reported no change in their daily physical activity (Figure 7). There was not a

significant correlation between participant physical activity changes and current stress levels, $r = .08$, $p = .055$.

Participants also reported decreases in their child(ren)'s daily physical activity; 67.5% of participants reported that their child(ren)'s physical activity decreased or significantly decreased, 16.6% reported no change in their child(ren)'s daily physical activity, and 15.9% reported somewhat or significantly increased daily physical activity for their child(ren) (Figure 7). There was a small significant correlation between changes in child(ren)'s daily physical activity and participants reports of current stress levels, $r = .16$, $p = .001$, such that as child(ren)'s daily physical activity decreased due to isolation, participants reported current stress levels increased.

Figure 7

Distributions of Family Play Time, Participant Physical Activity, and Child Physical Activity



Note: Pie chart A: Distribution of participant responses to the question, "How has isolation impacted the amount of time your family spends playing together?" Pie chart B: Distribution of participant responses to the question, "How has isolation impacted your daily physical activity?" Pie chart C: Distribution of participant responses to the question, "How has isolation impacted your children's daily physical activity?"

Exploratory Factor Analysis

Stress. An exploratory factor analysis (EFA) was conducted on those variables that were coded as stress variables in this study. One variable, elder care, was excluded due to missing data (N = 440, n = 206). Initial extraction was based on Eigenvalues greater than one and cases were excluded listwise. Analysis of the initial factor extraction was conducted with factor loadings below .40 being suppressed due to sample size (n = 234) (Hair et al., 2009). Results of Bartlett's test of sphericity indicate that the correlation matrix was not random, χ^2 (136) = 1570.44, $p < 0.001$, and the Kaiser-Meyer-Olkin (KMO) measure verified sampling adequacy for the analysis, KMO = .807. Four factors had eigenvalues over Kaiser's criterion of 1, while scree plot analysis indicated that between four and six factors could be retained. Only four factors demonstrated significant factor loading in this model, so it was decided to proceed initially with a four-factor model. The final factor model reveals nine variables loaded onto two factors explaining 58% of the variance (Table 11).

Table 11

Final Factor Extraction CPIS Stress Variables

Stress Variable	Rotated Factor Matrix	
	Factor Loading	
	1	2
Factor 1: Caretaking Stress		
11. Parenting	**.865**	.060
8. Relationship with my child(ren)	**.847**	.099
9. Social Isolation	**.604**	.133
6. Relationship with my partner	**.524**	.300
19. Ability to care for my child(ren)	**.490**	.092
5. My child(ren)'s education	**.461**	.171
Factor 2: Financial Security Stress		
2. Finances	.105	**.853**
3. Housing security	.090	**.840**
10. Employment	.323	**.487**

Note: n = 234. The extraction method was maximum likelihood with a Varimax rotation with Kaiser Normalization. Factor loadings over .40 appear in bold and variables are sorted by highest loading.

Resilience. An EFA was conducted on those variables that were coded in this study as resilience variables. Initial extraction was based on Eigenvalues greater than one and cases were excluded listwise. Analysis of the initial factor extraction was conducted with factor loadings below .30 being suppressed due to sample size (n = 432) (Hair et al., 2009). Results of Bartlett's test of sphericity indicate that the correlation matrix was not random, χ^2 (66) = 1657.77, p < .001, and the Kaiser-Meyer-Olkin (KMO) measure verified sampling adequacy for the analysis, KMO = .804. Four factors had eigenvalues over Kaiser's criterion of 1, while scree plot analysis indicated that between three and five factors could be retained. Only four factors demonstrated significant factor loading in this model, so it was decided to proceed initially with a four-factor model. The final factor model reveals six variables loaded onto two factors explaining 58% of the variance (Table 12).

Table 12

Final Factor Extraction CPIS Resilience Variables

Resilience Variable	Rotated Factor Matrix	
	Factor Loading	
	1	2
Factor 1: Hope		
27. I believe that my family will be okay throughout isolation	**.741**	.267
26. My family is able work through disagreements respectfully	**.590**	.137
28. I believe that my family will be able to get back to normal once isolation is over	**.469**	.235
Factor 2: Agency		
23. I believe that I have control over what is happening in my life	.195	**.604**
25. I have goals that I believe I will be able to achieve during isolation	.247	**.561**
22. My family have established a daily routine	.131	**.472**

Note: n = 435. The extraction method was maximum likelihood with a Varimax rotation with Kaiser Normalization. Factor loadings over .40 appear in bold and variables are sorted by highest loading.

Discussion

Review of Research Questions

This study aimed to assess how parents were coping with the Covid-19 pandemic in the early months of the public health responses in Canada. The study was designed to identify which aspects of life during the pandemic parents were experiencing as the most stressful, which variables are contributing to increased levels of stress, and which variables are acting as buffers to stress.

Parent Stress is High

This study demonstrates that Covid-19 has had significant impacts on the stress levels of parents. Over 90% of parents in this study reported that Covid-19 had increased or significantly increased their daily stress levels. High levels of cumulative current stress were reported as well as high levels of stress related to individual stress variables. Research done by the APA (2019) reports that Americans define a healthy level of stress as 3.8 out of 10. By this metric, 88% of parents are reporting unhealthy levels of stress at the time of this study. Additionally, from the APA's yearly Stress in America survey, adults in 2019 reported an average stress level of 4.9 out of 10 (APA, 2019). The respondents in this study reported an average stress level of 6.6 out of 10. This number is 1.7 points higher than the American average in 2019 and 2.8 points higher than what American's consider to be a healthy level of stress.

Child(ren)'s education, parenting, social isolation, and employment showed the highest levels of stress on individual measures. Participants reported being most worried about their own health, followed by access to food and medications, and the ability to

care for their child(ren). Participant-child relationships and parenting showed the strongest relationships to current stress levels. Education for one's child(ren) also correlated highly to current stress. Parenting stress showed a significant relationship with social isolation stress and with the stress occurring in relationship with one's child(ren). This suggests that there is a relationship between the quality of parent-child relationship and amount of stress experienced in parenting said child. This corresponds to previous research on parent-child relationship quality and perceived parenting stress (Esdaile & Greenwood, 2003; Magill-Evans & Harrison, 2001).

Demographics

No differences in current stress levels appear in this study between self-identified men or women (non-binary were excluded from analysis due to small sample size), nor among participants with diverse ethnic identities. It is clear that the pressures and challenges of the Covid-19 pandemic are eliciting stress responses across the population. It is possible that, while levels of stress appear consistent across gender and ethnic identities, differences may be found in the details of how stress is manifesting. It is also possible that the stressors in this study did not capture gender or ethnic differences. It must be noted that there were unequal sample sizes between men and women and between Caucasian, Indigenous, and ethnically diverse populations groups that may have masked potential variations in stress reports. It would be worthwhile for future research to seek to capture a greater portion of men and non-binary individuals as well as various ethnic identities.

Only one stress variable, elder care stress, showed a small but significant effect of gender, suggesting that men were reporting higher levels of stress associated with caring

for elderly relatives than were women. This is contrary to previous research regarding unpaid care burdens for women, including care of elderly relatives. However, it is possible that as this care burden has fallen primarily to women in the past, women have developed a capacity and acceptance to undertake this work. With the shifting dynamics associated with mass layoffs, altered work schedules, and work from home orders some of the responsibilities for elder care may have shifted from women to men, or to a more equal shared load, in a new way. It would be beneficial for future research to look at whether Covid-19 had an impact on shifting care responsibilities and caretaking dynamics within the home. There was no statistically significant effect of gender on any of the resilience variables.

Parenting

Social isolation has been shown to have significant effects on stress and well-being across populations and circumstances of isolation (Brinkley-Rubinstein et al., 2019; Heidari Gorji et al., 2019; Holt-Lunstad, et al., 2015; Loades et al., 2020; Nicholson, 2012). In this study, social isolation correlated highly with current stress levels, which was unsurprising due to the extent of research on this topic. Interestingly, social isolation also correlated highly with the stress associated with parenting, suggesting that social isolation might be experienced differently and/or have a more significant impact in a parenting population. Parenting is a challenging and demanding task and parents utilize, and often rely on, other people to support and assist in the process of raising children. These individuals may be personal relationships (friends, family), community relationships (neighbours, faith communities), or they may be professional supports and services (school, day care, therapists, health professionals). The relationship between

social isolation stress and parenting stress likely represents a bidirectional relationship. As the stress of parenting increases, parents more acutely feel the absence of others in their parenting journey, and as parents feel more isolated and alone, this acute loneliness manifests in increased stress levels in the challenging tasks of parenting. One participant summed up her experience saying; “We are not meant to raise children in isolation and it’s enough to drive a person completely crazy.” The relationship between social isolation stress and parenting stress highlights the needs of parents to have other people alongside them as their parent their children.

While participants overwhelming reported that their socialization outside the household had decreased, four out of five parents in this study reported that social isolation measures had increased the amount of time spent with their children and over half indicated that the time spent with their partner had also increased. These results indicate that participants were not experiencing social isolation within the home, but rather outside of the home. While there was no significant relationship between participants’ time with their partners or partners’ time with their children, several participants noted in the qualitative data that watching their child(ren) getting to spend more time with their partner was particularly rewarding.

There was a relationship between time spent with children and current stress levels such that increased time spent with one’s child(ren) was associated with higher levels of current stress. It is possible that those parents who reported significantly increased time with their children were those who were working from home and were juggling the demands of working from home and supporting their child(ren) to do school from home or providing supervision of younger children that was previously done by

others while the parent worked. This overlap of responsibilities was very clearly a significant source of stress and frustration that was articulated by parents in the qualitative data: “I'm beyond stressed that my job expects me to work at 100% but I'm at home with my family and they also need me.” Juggling these multiple demands left many parents feeling exhausted and overwhelmed: “Although I am extremely grateful to be safe at home [and] have my kids and husband home with me, ... this has been the most exhausted I have ever been. ... It just feels like overnight the weight of the world is on my shoulders. There are good days, even great days, but hard days too, as the demands on my time/mind/body to care for two kids ... in a pandemic seem relentless.”

Parents need other adults for their own social needs and mental and emotional well-being. Participants in this study noted the significant impact of loss of child care, children’s activities, and opportunities for socialization for both themselves and their child(ren). “I am very worried about the social development of my 3.5-year-old and ALL of our mental and physical health,” said one participant. Another participant noted: “My kids are SUFFERING without any access to people or activities.” This loss of external socialization coupled with increased time with their child(ren) at home meant that parents often became their child(ren)’s primary source of socialization, which is not developmentally appropriate for the parent or the child. “Loss of ... ability for [my] child to socialize with others her age is particularly detrimental to [her] development. No one seems to be talking about this and I find it extremely frustrating. Play is an important part of brain development and children do not play with adults in the same way they play with peers.”

For parents in this study, having more children in the household and having children that were older were associated with lower levels of stress. During stay-at-home orders where socialization outside the household was at a minimum, having more children in the household would allow for built in play mates and socialization opportunities for the children. One parent stated this very clearly saying; "the kids have been good friends to each other which helps…but they need other kids!" Participants who had only one child in the house told a different story: "social isolation for an only child has been really hard." Another parent reported that one of the most challenging parts of isolation was, "only having myself and my child to socialize with." Having multiple children in the household may help to relieve some of the time requirement of parents to supervise and entertain their children when they were also potentially trying to work from home. Older children are more capable of doing tasks, participating in school, and engaging in activities without direct, constant supervision; whereas, the needs of young children are often immediate and require direct guidance from adults (such as toileting, feeding, basic hygiene).

There was no significant relationship between parenting dynamics and current stress levels. Some previous research has found that single parenting is associated with higher levels of stress (Copeland & Harbaugh, 2005; Östberg et al., 1997), though that was not replicated in this study. There was, however, a significant relationship between reports of parenting stress and reports of stress associated with the participant's relationship with their partner. Stress within the spousal relationship has been shown to contribute to elevated levels of stress and subsequent effects on mental and physical health and perceived quality of life (Thomas et al., 2017; Umberson et al., 2006) and

quality of the spousal relationship has been shown to impact both quality of relationship with the child(ren) and stress associated with parenting (Erel & Burman, 1995; Krishnakumar & Buehler, 2000; Ponnet et al., 2013). High levels of stress within spousal relationships at this time may help to explain why there was no significant effect of parenting situation as there may be significant within group effects that could not be accounted for in this data set. In the qualitative data, some participants mentioned that one of the most rewarding aspects of isolation was getting to spend more time with their partner, while other participants spoke about their partner relationship under the heading, "what has been most challenging" – often referencing disagreements about Covid-19, partner's stress, or partner's mental health. It should also be noted that the sample size of single parents in this study was small (8%) and that those parents who are working out custody or sharing custody were not included in this analysis due to small sample sizes.

There was a negative relationship in this study between parental age and stress level such that older parents reported lower levels of stress. Some of this effect may be due simply to brain development and maturation, while a large part of this effect is likely due to experience. Older parents have simply had more time in which to experience challenges in their lives, relationships, and parenting and therefore have had more opportunity to develop and hone flexibility and coping skills. Younger parents are also more likely to be raising their first child and losing the community and support that is anticipated and required during the earliest years of new parenting significantly altered that experience and understandably increased stress around a new and unknown challenge. One parent reported, "This entire postpartum experience has been horrible. Covid has robbed, and continues to rob, me of the joyful parts of having a new baby; this

is precious time that my family and I will never get back." A number of other new mothers mentioned how hard it has been not having the opportunity to meet other new moms and regular parenting tasks became fraught with anxiety: "[I have] to carefully consider if/when I should bring myself or my child to medical clinics for non-urgent concerns." If younger parents are less likely to have multiple children and, as noted above, having more children is correlated with lower stress levels during isolation, then number of children in the household might also account for some of the parental age-related differences in stress.

In this study, worries about family violence and addiction within the family had small significant correlations with current stress levels. Quarantine measures have been shown to exacerbate the incidence and severity of intimate partner and family violence in previous epidemics and in the current Covid-19 pandemic response (John et al., 2020; Peterman et al., 2020; United Nations Secretary General, 2020). Stress associated with family violence and addiction is challenging to measure in general population studies as they are threats that cause no concern in families where they are not present, and significant concern in families in which they are a reality. As such, measuring the impact of family violence and addiction may be more effectively done by selecting samples with known experiences of family violence and addiction.

This study looked specifically at a sample population of parents. Parents are first and foremost human beings, and as such, the stress variables included in this study sought to identify sources of stress both within the role of parent and in the ecological location of parents as adults in a society coping with a global pandemic. Though there was significant stress associated with parenting variables, personal health, employment, and

social isolation also ranked in the top five most significant stressors for parents in this study. This study shows that there is a mixture of parenting and non-parenting related variables contributing to elevated stress levels. This suggests that to assess parents only by their role as such may result in omitting other significant factors that contribute to parental stress.

Health

Covid-19 posed particular risks to certain populations due to its high contagiousness, potential for severe respiratory symptoms, and heightened fatality rate for individuals with comorbidities (Gold et al., 2020; Public Health Agency of Canada, 2020b; Sanche et al., 2020; WHO, 2020). There was no significant difference in current stress levels between those participants who reported that a member of their household was living with a health vulnerability (chronic illness, significant disability, immunocompromised) and those who did not. However, having a household member with a health vulnerability was significantly correlated with higher levels of stress in some health-related stress variables. All three health vulnerability variables impacted participants worries about the health of their families. Having a family member who was immunocompromised or had a chronic illness increased participants worries about access to food, medications, and other essentials. Having a family member who was immunocompromised impacted participants stress regarding caring for elderly relatives, while having a family member with a chronic illness increased participants stress related to their own health.

There are a few possibilities for why current stress levels were unaffected by health vulnerabilities in the household. First, it is possible that families who have been

living with this type of vulnerability were already existing with some of the precautions that others were unprepared for (ie: heightened hygiene measures, selective socialization, etc.). Additionally, these families may have developed coping mechanisms for dealing with health-related stress that others in the population do not have. Second, this study asked about members of the household who were affected, intending to capture the experience of parents if they or their children lived with a vulnerability. It is possible that there is a difference in stress experienced if the participant is the vulnerable individual compared with a spouse or child. If this is the case, individual differences will be spread across participants who answered affirmatively, therefore, masking group differences. As health vulnerabilities affected specific health related stressors, but these stressors varied depending on the category of vulnerability, it is most likely that there are individual differences in stress level depending on who in the household is affected and that these differences are masked when the population is pooled together. There are significant effects of living in a household with someone with a vulnerable health status on health-related stressors and worries, but these stressors appear to be mediated or exacerbated by other variables in the population, thus not impacting current cumulative reports of stress.

Employment

In this study, loss of employment (for both self and partner) and employment instability both had significant effects on stress levels. Employment has repeatedly been shown to be a major source of stress and the WHO states that even the threat of having one's employment impacted can result in a stress response (Ehlert et al., 2001; Wilkinson & Marmot, 2003). The Covid-19 pandemic closed many businesses, caused significant numbers of layoffs, jeopardized people's employment stability, and caused massive

changes in the way that people worked for those who remained employed. This study found that over one in three participants had experienced loss of, or change to, their employment since the introduction of the public health measures to slow the spread of Covid-19. Participants also reported high levels of uncertainty regarding their employment with only one out of three reporting that they did not anticipate future changes to their employment due to the Covid-19 pandemic.

Being laid off and having one's hours reduced both resulted in increased stress levels. Interestingly, the same impacts were not seen for those who were self-employed and lost income potential. One study found that there were differences in primary coping strategies between those who are self-employed and those who are organizationally employed (Oren, 2012). This study found that those who are self-employed are more likely to use proactive coping strategies and face problems head on, while those who are organizationally employed are more likely to employ passive or avoidant coping strategies and that, though employment type was not related to overall stress level, primary coping strategy was.

Another study found that entrepreneurs reported lower levels of stress compared to the general population and that this difference was related to high levels of psychological capital that may draw these individuals into self-employment or entrepreneurship (Baron et al., 2013). It seems reasonable that those individuals who have chosen self-employment may have greater risk and stress tolerance. Those who are self-employed accept a certain amount of uncertainty and risk that is inherent in starting a business or working for yourself, and this may serve them well in facing the employment uncertainties of the Covid-19 pandemic. It is also likely that those who are self-employed

experience a greater sense of control over their employment potential than do those who are externally employed. That is, those individuals who were laid off from an external source must compete in the job market and face greater uncertainty about regaining employment, whereas those who are self-employed, though faced with lost income, know that they are in control of returning to their work when the stay-at-home measures lift and the economy starts to regenerate. Though those who were externally employed reported the highest stress levels, experiencing any employment impacts negatively affected participants' stress. This indicates that, as much as possible, allowing people to maintain their employment will contribute to lower levels of stress in the population.

Participants in this study reported increased stress levels when their partner's employment had been impacted, though the pattern was slightly different. Again, those participants whose partners' employment status remained the same as it was prior to the Covid-19 public health measures reported the lowest levels of stress. Similar to personal employment change, partners being laid off resulted in higher reported stress levels for participants.

The other category that impacted participants stress levels was having a partner whose hours increased during the Covid-19 outbreak. There are two possible pathways that might explain this difference. First, if partners are working longer hours, the participants are left at home alone with the children for greater amounts of time and, as seen above, greater time spent with children was associated with higher stress levels. The second possible mechanism is that, during the Covid-19 public health responses that resulted in business closures and loss of employment for many people, those individuals who experienced an increase in work hours were often those who were employed in

essential services such as health care, emergency response, frontline social services, and other occupations such as grocery store employees that have significant interaction with the public. Due to the nature of the Covid-19 virus (contagion and severity of illness) these individuals were at higher risk for infection than those individuals who were able to work from home. If the partners whose employment increased represent this portion of the population who had significant exposure to the public and therefore increased risk of exposure to the virus, it would be unsurprising that the increased work hours and subsequent exposure resulted in higher levels of stress for participants. However, this employment information was not collected in this survey so it remains unclear as to the exact mechanism of this particular stress impact.

Caretaking Stress and Financial Insecurity

Two latent stress factors were identified through exploratory factor analysis: caretaking stress and financial insecurity stress. Caretaking stress encompassed parenting, relationship with one's child(ren), social isolation, relationship with one's partner, worry about one's ability to care for their child(ren), and child(ren)'s education. This factor represents many of the variables already discussed above. The clustering of these variables indicates that there are relationships between the caretaking requirements and the significant relationships involved in these tasks. As noted above, quality of relationship with one's partner and child(ren) have strong impacts on the stress associated with parenting.

The second stress factor, financial insecurity stress, represents finances, housing security, and employment variables. These variables were also noted above as each individually contributing to current stress levels. It is unsurprising that this factor arose in

analysis as financial security is well documented to be a determinant of both physical and mental well-being (WHO, 2014; Wilkinson & Marmot 2003).

At the time that this survey opened, the Canada Emergency Response Benefit (CERB) had only been available for a month – applications opened in early April, 2020 (Department of Finance Canada, 2020). The CERB benefit offered to provide up to $500 a week for individuals who had lost their jobs due to Covid-19. Due to the timing of the survey, and the slow rollout of CERB benefits, it is possible that some participants were beginning to receive CERB income, and it is likely that many were still waiting for the benefits to come through. If participants were laid off at the beginning of the stay-at-home and business closure orders (March 16, 2020) (OCMOH, 2020a), at the time of this study, they would have been without employment for almost two months, potentially generating significant financial strain.

In addition to those who were laid off, individuals who were not laid off but had their hours reduced faced financial challenges during the Covid-19 pandemic response. These individuals were not eligible for Employment Insurance or CERB benefits and therefore had their income reduced without supplement from the government. Some of these individuals had to make a choice; stay with the reduced hours and manage the reduced income but maintain employment and hope for a return to increased hours, or request a layoff, or quit their job, to be eligible for income support benefits but sacrifice the security of maintaining the employment. With almost 40% of participants reporting employment impacts due to Covid-19, and the clear indications in this study that financial and employment variables play a significant role in stress levels, employment and

economic factors of this pandemic response have, and likely will continue to have, far reaching and long-lasting impacts.

The pairing of a caretaking stress factor with a financial insecurity stress factor highlights again the social location of parents as both holding the important role of caring for children and maintaining familial relationships as well as being adults in a greater society who have interests and concerns outside of the household. It is crucial to consider parents as not only parents, but valuable members of society with vested interests in the economy and community both because of their children and outside of their role as parents.

Play and Physical Activity

In this study, increased time spent playing together as a family was correlated with lower levels of reported stress. Play serves many biological, social, and developmental purposes for human beings across the lifespan. Play is of such importance to child development that the United Nations has declared play a right of all children (United Nations Convention of the Rights of the Child, 1989). Play helps support adaptation in children and adults by regulating affect, diminishing stress, building positive relationships, helping to integrate new information, and allowing for experimentation with new coping or relational strategies (Nijhof et al., 2018). All of these skills are crucial during the Covid-19 pandemic response. This is a time of novel experiences, competing demands, shifting governmental instructions, and high levels of uncertainty about the future. Utilizing play as stress relief, an opportunity to exercise flexible thinking, and a way to engage socially can promote mental, physical, and relational health and well-being.

Play has been shown to contribute to lower levels of stress and anxiety, lower incidence of addiction, better adaptation through life transitions, and increased prosocial behaviours (Nijhof et al., 2018; Yogman et al, 2018). Adults can expect to gain similar emotional, physical, and relational health benefits as children. For parents, playing with their child(ren) can help promote positive relationship, improved communication, shared joy, and increased reciprocal relational interactions (Yogman et al, 2018). As noted above, improved interpersonal relationships within families can help to reduce stress levels associated with parenting. During the public health measures required to slow the spread of Covid-19 when socialization outside the household is limited, family play may be a key to promoting healthy development and decreasing stress for both parents and children. It is no surprise that family play time is associated with lower levels of stress and promoting family play and providing resources and opportunities for families to play together may be a way to buffer the stress of the Covid-19 pandemic for both parents and children immediately and in years to come.

Physical activity is crucial for mental and physical health across the lifespan. Physical activity lowers risk of obesity, cardiovascular disease, hypertension, and diabetes (Poitras et al., 2016). Physical activity can help to decrease stress reactivity and may help to prevent or reduce severity of anxiety and depression (Lipnowski et al., 2012; Phillips et al., 2016). Greater physical activity levels have been linked to decreases in sleep latency (Nixon et al., 2009), longer sleep duration (Khan et al., 2015), and higher quality of sleep (Wachob & Lorenzi, 2015) in children. Closures of children's activities, recreations centers, and play places decreased access to physical activities and to locations where physical activities were available (pools, gyms, playgrounds and parks,

etc.). This study shows that these closures greatly reduced both parent and child physical activity levels during lockdowns and stay-at-home orders. For participants in this study, higher levels of physical activity in their child(ren) were associated with lower levels of stress. This might be a mechanism of children with more significantly decreased daily physical activity representing children who were highly involved in sports and other activities and some of that stress might be due to loss of socialization and structure that comes from that involvement. It is also likely that parents whose children manage to maintain high levels of physical activity are reaping the benefits of in areas of increased concentration, improved sleep, and decreased stress reactivity. Physical activity helps to maintain children's nervous system regulation, expel energy, occupy time, and promotes healthy growth and development. These in turn may help to improve concentration and reduce emotional outbursts. Encouraging and facilitating daily physical activity for children appears to help reduce stress for parents.

Resilience

Resilience has been defined for the purposes of this study as the ability to utilize one's internal and external resources throughout adversity to achieve positive outcomes. The key definition of trauma can be summed up as any experience that overwhelms the individual's capacity to cope. Therefore, resilience can also be seen as a sum of internal (skills, abilities, coping strategies) and external (relationships, community resources, social climate) factors that support one to have capacity to cope during and after challenging experiences. Participants in this study reported high levels of resilience as measured by agreement with resilience variable statements. However, there was no clear indication that any of these resilience factors contributed to lower levels of current

perceived stress. There was also no main effect of resilience on current stress level, nor an interaction effect between stress variables and resilience variables. This is contrary to the current emphasis in mental health fields on the power of resilience to effectively buffer stress.

One explanation for the lack of effect of resilience resources on perceived stress might be that the participants in this study were assessed during the ongoing experience of responding to the Covid-19 pandemic, and therefore in the midst of actively responding to the adverse events. It is possible that once the threat of the pandemic is under control, the economy returns to pre-pandemic states, and community supports and resources are back up and running, there will be a greater measurable effect on how resilience variables contribute to buffering lasting effects of the stress of this situation.

Another explanation might be that resilience resources are developed through time and experience and the current Covid-19 pandemic response is unprecedented and therefore, individuals have not developed the resources necessary to deal with the complex, brand new set of challenges that they are now facing. If this is the case, it would follow that as the pandemic progresses, an uptick in impact of resilience on stress should be seen as individuals develop coping strategies and resilience resources specific to this experience.

A final possible explanation is that the compounding stress of the Covid-19 pandemic has overwhelmed individuals' ability to cope so significantly that the stressors are simply outweighing the impacts of resilience resources at this time. This is an important possibility to consider because it suggests that even when resilience resources are present and individuals have coping skills at their disposal, life events and

circumstances can cause a perceived, and likely biological, stress response that is significant and might have lasting health impacts. If this is the case, the field of stress research would be well served to switch their focus from self-report and social markers of success to looking at biological markers of stress. It is possible that the presence of resilience resources is able to mask some of the overt signs of stress, especially the social impacts of stress. For example, a parent in this study may be working from home, getting their kids through their school work, and not abusing substances or exhibiting overt mental health concerns. From an outcome perspective, this might look like successful resilience; however, if they are experiencing a perceived stress response of a nine out of ten and their cortisol and adrenaline markers match this experience, they are at increased risk for all of the stress related physical health outcomes, regardless of the social success that they may be portraying. Another example could be that an individual is maintaining relationships with their family members, but if these relationships are fraught with stress due to external variables such as finances and employment, the individual is maxing out their resources to maintain the familial relationships and are therefore unable to succeed in other areas of their life such as learning something new or excelling at work.

The reality is that resilience resources do not remove or eliminate stress; they can only help a person cope more successfully with stressors and challenges. Resilience cannot triumph over stress to produce a positive outcome until the stressor has been removed or come under control. The data in this study challenge the idea common in the fields of mental health and social services that resilience is enough for people to exceed under extremely adverse circumstances. In the population of this study who reported high levels of resilience resources, the stress that they were experiencing still outweighed the

influence of these resilience resources. Supporting individuals and families to develop resilience resources is important and valuable work as it will increase the threshold under which they are able to function well. However, this study indicates that targeting specific stressors could be a more effective use of resources and could more quickly and efficiently decrease stress levels.

The one resilience variable that was approaching significance in this study was the belief in having control over one's life. This variable might be more significant because it represents a sense of agency and personal empowerment – that is, participants with high levels of this internal locus of control might be better able to weather higher levels of stressors as they believe that they have some influence over their own lives and futures. Previous epidemics have shown high rates of PTSD among those individuals who faced quarantine and social isolation measures (Hawryluck et al., 2004; Reynolds et al., 2008). The Covid-19 pandemic and the social isolation and public health measures have left many people feeling completely out of control and uncertain about the future. "Right now, the unknowns are the hardest. At the moment we are lucky to be gainfully employed, but that could change, [we] have child care, but that could change, and are healthy, but again, that could change. The lack of control can be difficult to adjust to." Perceived or actual loss of control during a traumatic event has been repeatedly linked to higher risk of developing post-traumatic stress disorder (PTSD) (Maes et al., 2001; Udwin et al., 2000). An internal sense of agency can counteract feelings of hopelessness that accompany many of the stressors measured in this study: financial, housing, and employment uncertainty, worry about access to needs, and fear of addiction and violence. Supporting individuals and families to develop a sense of control and agency in their

lives may be an avenue to decreasing overwhelm, hopelessness, and ultimately stress during the ongoing Covid-19 pandemic and may help people to bounce back as life returns to normal.

Agency and Hope

Two latent resilience factors were identified through exploratory factor analysis: hope and agency. Agency included the variables, "I believe that I have control over what is happening in my life", "I have goals that I believe I will be able to achieve during isolation", and "my family have established a daily routine." Hope encompassed the variables, "I believe that my family will be okay throughout isolation", "my family is able work through disagreements respectfully", and "I believe that my family will be able to get back to normal once isolation is over." The variables included in the agency factor indicate a sense of control over the present, while the variables included in the hope factor speak to a sense of safety and positive regard about the future and challenges that may come. Agency and hope are somewhat similar constructs in that they both include some level of optimism and motivation. However, agency could be described as an operationalization of hope. That is, hope involves belief in possibility and positive, or different, outcomes, while agency represents the individual's belief in their ability to act upon their own circumstances to effect outcomes. Both agency and hope play a crucial role in defending against hopelessness and sustaining through uncertainty.

Hope has consistently been connected to better outcomes from psychology and psychotherapy, to physical health outcomes, to athletics and academics (Snyder, 2002). Hope seems to be a critical driving force behind individual and societal well-being (Miceli & Castelfranchi, 2010). Hope has also been shown to mediate the relationships

between parental stress and parental maladjustment (Horton & Wallander, 2001). The presence of a hope factor among the resilience resources in this study suggests that hope plays a relevant role in the lives of parents during the Covid-19 pandemic.

Hope is a powerful force; however, it is not considered a stable personality trait, the way that optimism has been found to be. Rather, hope can ebb and flow, and nothing challenges hope more than persistent lack of positive change. Some participants in this study specifically named hopelessness and loss of hope as the things that were challenging them most during isolation and many spoke about fears and uncertainties about the future. One participant summed up her limits of hope saying: "some of the questions above – such as feeling life will go back to normal and feeling my family will be ok during isolation depend on how much longer it lasts. We can do another month or so financially, socially and emotionally but longer than that will have dire consequences to us and our economy."

Stress and Resilience Interactions

As mentioned above, if resilience resources are developed through time and experience it follows that some stress variables should show relationship to resilience variables even if cumulative stress levels are unaffected. Though there was no significant effect of any resilience variable on current stress levels in this study, some stress and resilience variables showed correlational relationships to one another. This indicates that individuals have developed skills and resources to manage specific stressors in their lives.

As parenting was the stress variable most strongly correlated to current stress levels, is serves to examine which, if any resilience variables correlate with parenting stress. The resilience variable most strongly correlated with lower levels of parenting

stress was a belief that the family would be okay throughout isolation. This item was adapted from the Resilience Scale item that asks about making it through difficult times (Wagnild & Young, 1993). A personal belief in the strength and tenacity of oneself, or in this case one's family unit, can lend perseverance in challenging times. Having a sense of control over what is happening in their lives, and having goals that they believed to be achievable during isolation were also associated with lower levels of parenting stress for participants. As discussed above, both hope and agency can act on parenting stress through the belief that the parent has an active role in their relationship with their child(ren), their child(ren)'s development, and the outcome of their families lives.

Both participants ability to maintain strong relationships and participants' reports of their child(ren) being able to maintain strong positive relationships correlated with lower levels of parenting stress. This aligns with the ideas discussed above regarding parents' need for others in both their own lives and the lives of their children in order to support positive development for their children and positive parenting experiences for themselves. Participants who reported that their family was able to work through disagreements respectfully reported lower levels of stress. This variable may have a bidirectional effect – participants with lower levels of stress are more likely to be able to engage in respectful disagreements and those participants who experience respectful interactions within their families are more likely to experience less stress in their familial relationships.

Recommendations

Quarantine has repeatedly been shown to cause social, psychological, relational, and economic harms both on an individual and societal level. Following the SARS

epidemic, many researchers made recommendations regarding future outbreaks and epidemic responses. Some of these recommendations included limiting the extent and duration of quarantine measures, providing financial support to those who lose income due to quarantine requirements, providing adequate supplies to meet basic needs, providing clear information that does not induce unnecessary fear or panic, early involvement of volunteer and social support agencies, and providing additional support for those at increased risk of adverse psychological or social consequences of quarantine (Brooks et al., 2020; Gostin et al., 2003; Hawryluck et al., 2004; Reynolds et al., 2008).

The data in this study supports recommendations that others have made during the Covid-19 pandemic, the SARS epidemic, and Ebola outbreaks. First, due to the extensive impacts of quarantine on individuals and society, the least restrictive/intrusive measures (that are able to achieve the public health safety) should be implemented (Barbisch et al., 2015; Gostin et al., 2003). The high levels of stress and distress evidenced in this study is further support for implementing least restrictive measures.

There are many supports and services named by participants in this study that significantly impacted their lives and family's wellbeing when they were shut down due to mass quarantine. Many of these supports and resources represent resilience resources that may have made a difference in buffering the levels of stress experienced by parents during this time. Parents in this study noted closures of areas designed to promote physical activity (playgrounds, pools, recreation centres, parks) and resources that represent the relational and community needs of parenting (socializing, day cares, informal child care, school). Though some of these activities represented increased risk of transmission, such as schools, others had little to no scientific basis for closure, such as

park spaces and playgrounds. In order to promote least amounts of harm from widespread quarantine measures, it is recommended that only necessary and evidence based shut downs are enforced, that these measures are enacted within limited time frames, and that additional and creative resources are put into place to allow for necessary quarantine measures while limiting loss of resources upon which parents and families rely.

As parenting and relationship with one's child(ren) were highly significant to levels of stress in this study, interventions during and after quarantine should focus on improving the quality of relationship between parents and children. There is a high likelihood that the measures required during the pandemic response will result in higher incidences of behavioural challenges in children which can lead to greater parenting stress levels. However, research has shown that improving the quality of parent-child relationship can lower perceived stress associated with parenting (Cooley et al., 2014; Umberson, 1989) and that stronger parent-child relationships can buffer the impact of parents' stress on children (Tharner et al., 2012). Therefore, interventions targeting the quality of relationships within the family unit and especially between parent and child should be examined as an effective way to reduce parents' levels of stress overall.

It is essential that governments and social/community agencies ensure that individuals and families have their basic needs met. In a review of ethical and legal challenges posed by the control of severe infectious diseases, Gostin et al. (2003) state; "When public health authorities require people to forgo their freedom for the common good, equity requires that the financial burden be borne by the community as a whole" (p. 3234). Forty percent of participants in this study stated that their employment had been impacted in some way by Covid-19. Several participants noted that they had lost health

benefits, lost access to medications, or lost access to important health services due to the quarantine measures that were imposed. If restrictive public health measures are required to ensure the safety of the community, then those members of the community who bear the burden of job loss, income reduction, and loss of health care provision must be supported by the government and public health agencies who have enforced the measures that have led to these losses. This includes providing sick pay to those who do not qualify for it, providing income support for those who have lost their jobs, and ensuring continuity of medical benefits for those who have lost the employment though which these are provided (Gostin et al., 2003). The Canadian government implemented CERB as an income support benefit, which meets some of these needs. However, those individuals who had their hours and income reduced do not qualify for this benefit. CERB also did not account for lost medical benefits which were of significance for many people. Financial support benefits should be extended to those with reduced income due to public health measures and should include some provision of medical coverage including prescription medications.

In the future, if there is a need for mass quarantine measures, parents should be given special attention. Many parents in this study identified that competing demands of work and parenting were overwhelming their capacity to cope and therefore their capacity to manage stress and parent well. Wherever possible, parents should be provided with work accommodations to care for their families in times of need. One parent expressed this particularly well, “It has all been very stressful and has presented a lot of challenges that are hard to cope with. As a parent, it’s been very hard on my mental health which has impacted myself and my family in many ways. During this pandemic, I

wish I could just focus on the health, safety and wellbeing of myself, husband and children, instead of having to worry about other things like employment, finances etc. It's been very lonely and isolating and I feel guilty about a lot of things, but am trying my best."

Parents in this study were asked to identify which resources would be of most benefit to them at this time. This list can be found in Table 7. During the implementation of public health measures requiring quarantine, agencies serving children and families may benefit from prioritizing providing families with those resources that parents named as most impactful to lose and most beneficial at this time. It is clear that parents were facing multiple, competing demands during the Covid-19 public health response, and were seeking activities that would support their children in play, education, and relationship. It was also clear that for those participants who were accessing counselling or specialized mental or physical health resources, the loss of these was significant. The percentage of individuals in a population who need these services is small, but for those who do need them, they are significant. Ensuring that individuals maintain the ability to access important mental and physical health resources (such as addictions counselling, child mental health, in-home support services, pre- and post-natal supports) is crucial in minimizing the impact of quarantine measures over the long term. One professional who participated in this study stated: "Stress levels added to fear added to government layoffs is creating high levels of family stress increasing family violence and suicidal ideation in my work." Another participant spoke about the impacts personally; "We couldn't continue our business [and] because of cost of meds switched to a cheaper type and they made me suicidal. [Alberta Mental Health] turned me down for counselling when I

needed it because I wasn't a drug addict, alcoholic, and wasn't suicidal yet. Group counselling that was really helpful was shut down."

For centuries, child rearing has been a challenge that has been the responsibility not only of individual parents, but of the community as a whole. During the Covid-19 pandemic, parents were required to stay at home, work from home, parent their children from home, and not access their communities, families, friendships, schools, or professional supports and services. This environment plummeted parents into an unprecedented isolation with their children that has the potential to create waves for years to come.

Limitations

One limitation of this study is the absence of a baseline measure. Collecting pre-pandemic stress and resilience baseline measures was not feasible due to the sudden onset of pandemic response measures. Another limitation is the lack of Covid-19 specific measures at the time of the study. The items included in this study were based on existing stress and resilience measures, and filtered through the lens of previous epidemic research. The specific measures in this study were designed to target the current realities of the Covid-19 pandemic and public health responses in Canada. As researchers and professionals learn more about how individuals are responding to and coping with the changing situations, additional research will help to build on the data being collected from the early months, including the data in this study.

As there was not yet research on Covid-19 from which to model this study, certain elements that would have been valuable for disaggregation of the data were not included. For example, not asking whom in the household suffered from health

vulnerabilities resulted in a mixed result whereby health vulnerability did not significantly affect stress but did correlate with some individual stress variables. If this data could be disaggregated based on relationship of the participant to the individual with the vulnerability a clear effect might be teased out. Similarly, requesting participant and partner employment details may have helped to delineate some of the employment impacts that were seen in this study.

Other limitations include a sample of predominantly mothers with limited ethnic diversity. Due to online recruitment through known social and community services agencies, this sample group had to have access to technology and was likely drawn from families who were involved with community resources in some way. This sample group may not be representative of families who do not engage in community resources and likely excludes families who were struggling with access to technology due to finances, access, or language barriers.

Finally, this sample resides primarily in southern Alberta and thus were subject to the timing and extent of public health measures specific to Alberta. Other regions with varying levels and types of restriction would logically face different challenges and possibly different levels and sources of stress.

Future Directions

People in different life stages and family configurations have experienced different challenges during the course of the Covid-19 pandemic. This study looked at a population of parents through an ecological lens with parenting as one component of identity. Parents are human beings first and experience all the same stressors as other adults with the added responsibilities of caring for and raising young humans. It would be

interesting to compare parent stress levels during Covid-19 to non-parent couples and single individuals. Parenting and relationships with children were high contributors to current stress levels for parents in this study, as were financial stability, employment, and partner relationships. Non-parent couples and single individuals would not share the parenting specific stressors, but may be experiencing higher levels of stress in other areas. One direction of future study would be to compare parent and non-parent adults on cumulative stress levels and significant sources of stress, to examine how much similarity or difference there is between the two groups. Evaluating the complex interplay between parenting stressors and the stressors of being an adult in an unprecedented global health crisis would be best done by comparing a group of parents against a similar demographic of non-parent adults.

This study measured stress and resilience variables with self-report alone. In this study, the findings that resilience variables are not acting on stress levels despite widespread reports of moderate to high levels of resilience contradicts previous research. A beneficial next step would be to examine the interaction of stress and resilience variables in a population and to compare this data to biological samples. The outcomes of the current study suggest that there may be times where the presence of resilience variables in high functioning individuals may make it appear as if people are doing well, while they are still perceiving and experiencing high levels of stress. Adding a biological measure would allow researchers to assess biological impacts taking place alongside social markers and self-reports.

Conclusion

There is clear evidence in this study that there has been a significant increase in stress for parents during the initial months of the Covid-19 pandemic response. Those participants in a low stress category based on their responses to individual stressors reported less overall stress than those in moderate and high stress categories. Participants reported that Covid-19 and the subsequent health measures had significant impacts on their daily stress levels. Resilience variables individually, and resilience category as a whole showed no effect on current stress levels, though there were some correlations between stress variables and resilience variables. This would indicate that in order to effectively buffer stressors, the types of resilience resources must be directly targeted at a specific stressor, rather than at collective perceived stress as a whole. This study also shows that specifics in the public health responses such as closure of resources, social isolation, and employment impacts had direct impacts on individuals stress levels. Increased stress levels need to be taken into account in planning for ongoing pandemic responses as well as supports and resources that are prioritized for reopening and implementation as public health measures ease in the future.

Chapter 3: Covid-19 Parent Stress and Resilience Study

Parenting is by far my boldest and most daring adventure.

Brené Brown (2012, p. 216)

Methods

This study was a follow-up to the Covid-19 Parent Isolation Study (CPIS). The CPIS was conducted between May 8 and June 15, 2020 during the peak of government mandated public health and stay-at-home orders. The present study was conducted between August 25 and September 13, 2020 after two months of varying levels of public health restrictions. The Covid-19 Parent Stress and Resilience Study (CPSRS) builds on the foundation of the CPIS and uses many of the same measures. Alterations were made to the original survey based on data from the first survey and changing public health measures. Some measures were added to assess the shifting circumstances of the Covid-19 pandemic and public health responses, and some measures were added to more clearly assess how stress was manifesting in parent and child populations at this time.

At the time of this study, public health measures in Alberta, and across most of Canada, had eased as active Covid-19 case numbers had decreased during the restrictions in the spring and had stayed relatively stable during the summer months (Public Health Agency of Canada, 2020a). However, case numbers were starting to increase again and modelling data predicted that case counts were likely to climb into the fall months with the reopening of schools and businesses if precautions such as physical distancing, isolation of the sick, and increased hygiene were not carefully adhered to (Public Health

Agency of Canada, 2020a). On July 21, 2020 the Minister of Education for Alberta announced that the province would return to near normal schooling in the fall of 2020 (Alberta Education, 2020). However, little detail was provided to parents regarding what this would look like or how students and families would be protected from Covid-19.

This study took place at a time in the Covid-19 pandemic where case numbers were relatively low and stable, public health measures were not excessively restrictive, and individuals and families had had a few months to adjust to the reality of life during a global pandemic. The aim of this study was to assess parental stress and resilience during this time period and to compare these results to those of the CPIS that was done during the initial months of the pandemic. The other present reality for parents at this time was their children's return to school for the first time since the beginning of the pandemic. Though case numbers were low at the time, there were still numerous concerns about how reopening schools might cause a sharp rise in Covid-19 infections. The timing of this study was intentional as restrictions and cases were relatively low, but return to school plans were unclear and causing concern among parents (Herring, 2020).

This study added behavioural checklists as an additional element to assess how stress was manifesting in parent and child populations. In the CPIS, it was found that even when self-reports of resilience resources were high, these were not impacting current stress levels for parents. It was noted that having some biological or behavioural measure of stress in addition to perceived stress reports could help develop an understanding of how stress was manifesting. As collecting biological samples was outside the scope of this study at this time, behavioural measures were added to accomplish this goal.

Participants

Participants were recruited using the same methods as the CPIS: online platforms, contact networks through the University of Lethbridge and community partners in the Lethbridge area, current and previous participants of research through the Brain in Action Laboratory at the University of Lethbridge, and social media call outs. The recruitment email can be found in Appendix 6 and social media call-out template can be found in Appendix 7. The overwhelming majority of responses came from within Alberta (n = 117) with three participants residing in Saskatchewan, and five participants who did not disclose their postal code.

A total of 129 individuals responded to the survey; however, 4 respondents were removed from analysis due to large amounts of missing data, leaving a final total of 125 participants. Ages of participants ranged from 24 to 61 years old with an average age of 37.6 years. The sample was overwhelmingly Caucasian (n = 93) and female (n = 117). Participants in this study collectively represented over 263 children ranging in age from newborn to 22 years old (dependent adult children) with an average child age of 6.6 years. The number of children in each household ranged from one child to seven children with an average of 2.1 children per household. Table 13 depicts detailed characteristics of participants in this study.

Table 13

Characteristics of CPSRS Participants

	n (*N* = 125)	%
Age (y)		
18-25	2	1.6
26-35	48	38.4
36-45	57	45.6
46-55	12	9.6
56-65	3	2.4
66+	0	0.0
Missing	3	2.4
Gender		
Female	117	93.6
Male	6	4.8
Non-binary	0	0.0
Missing	2	1.6
Ethnicity		
Caucasian	93	74.4
Indigenous	1	0.8
Ethnically diverse populations[a]	13	10.4
Missing	18	14.4
Age of children in the family[b]		
Infant (birth to 12 months)	14	11.2
Toddler (1-2 years)	31	24.8
Preschool (3-5 years)	84	67.2
School age (6-12 years)	103	82.4
Teen (13-18 years)	27	21.6
Adult dependent (19+ years)	4	3.2
Number of children in the family		
1	32	25.6
2	62	49.6
3	21	16.8
4	5	4.0
5+	4	3.2
Missing	1	0.8
Relationship to child(ren)		
Parent	121	96.8
Extended family care: grandparent, aunt, uncle, in-laws	4	3.2
Missing	0	0.0
Caregiving dynamics		
Living full time with partner and child(ren)	108	86.4
Shared custody with child(ren)'s other parent	5	4.0
Single parent caring for child(ren) full time	6	4.8
Working out custody arrangement	0	0.0
Caring for someone else's child(ren)	3	2.4
Full time parenting while partner works away from home	1	0.8
Missing	2	1.6

[a]Asian, South Asian, Chinese, Filipino, Pakistani, African, Sikh, multiracial. [b]Some families may be represented in more than one category due to multiple children in the household.

Survey Design

The aim of this study was to build on the data from the CPIS by assessing parents' experiences of stress and resilience resources further along in the pandemic response. This survey also collected behavioural data on both participants and children as an additional measure to supplement reports of perceived stress. This study employed an online, anonymous, self-report survey very similar in design to the CPIS. The full CPSRS survey can be found in Appendix 8.

Measures

Demographics. This survey included the same basic demographic questions as the CPIS: age, ethnicity, gender identity, relationship status, housing situation, and partial postal code. This survey also included a question asking participants to identify their household monthly net income. This was included due to the significance stress associated with employment and finances in the previous study. Participants were again asked about impacts of Covid-19 on their and their partner's employment. As this study was conducted after the lifting of many of the restrictions that resulted in business closures and layoffs, a question was included asking whether participants and/or their partners had returned to their pre-Covid-19 employment status. Finances were a significant source of stress for parents in the previous study, and, at the time of the CPIS, CERB was just coming into effect (Department of Finance Canada, 2020). A question was included on this survey asking whether anyone in the household was receiving CERB benefits. This was included to determine the usage of CERB in this population, and to see if CERB had any impact on financial stress being experienced during the Covid-19 pandemic.

Health. The CPIS found that though there were no significant effects on cumulative current stress levels related to living in a household with an individual who had a condition that might heighten vulnerability to Covid-19 (immunocompromised, chronic illness, significant disability), these vulnerable health categories correlated significantly with health-related stress variables. As such, these questions were included in the CPSRS to determine if prolonged exposure to the risk of Covid-19 in the community might alter the stress levels of those living with these health vulnerabilities. Additionally, as restrictions lifted across the province and the country, those individuals living with personal or household health vulnerabilities are likely to still be taking extra precautions and this disparity between their own situation and that of their friends, neighbours, and communities, may contribute to heightened stress.

The impacts of social isolation on both parenting stress and cumulative stress levels were clear in the CPIS. As restrictions in Alberta and across Canada lifted, the severity of isolation lessened for some individuals. However, strict isolation was still required for anyone who tested positive for Covid-19 and quarantine was required for individuals who were identified as a close contact of an individual confirmed to have Covid-19 (OCMOH, 2020c). This survey asked whether anyone in the household had been diagnosed with Covid-19, both as a general health variable, and in association with the context of quarantine and isolation for families.

Two other changes were made to health questions in this survey: one asking about loss of health/medical benefits, and one enquiring about postponed medical treatments. In an effort to ease the burden of the medical system, many non-urgent health treatments were postponed. Inability to access health care, and uncertainty about access to health

care have been shown to cause stress (APA, 2019). In the CPIS, numerous participants identified loss of access to health care, postponed medical treatments, and loss of health or medical benefits as significant sources of stress.

Parenting. The parenting measures used in this study were the same as those in the CPIS with the exception of removing the measure of participant's time spent with their partner as it was determined to be unrelated to stress levels.

Community Supports. Several adjustments were made to social and community support variables for this study. At the time of the current study, resources, supports, and businesses had been in various stages of reopening for approximately two to two and a half months. The previous study focused heavily on the impacts of social isolation and the community supports and resources that families had lost access to. The supports and services that were most impactful were clearly outlined in the CPIS. These measures were removed from this survey as the community was no longer under such extreme restrictions.

Due to various stages of easing public health restrictions, the current study removed these questions about access to resources. Instead, this survey focused on access to counselling, as it was a service that was reported to have had significant impacts on individuals and families when it was unavailable. A series of questions asked if anyone in the household had been accessing counselling; if yes, was access lost during lockdown measures; if yes, has the individual been able to re-access the service; and if no, what barriers prevented the individual from re-accessing. The data from these questions will allow for recommendations regarding continuity of counselling services in the future.

Stress. Minor adjustments were made to stress variables from the CPIS for this study. In the CPIS, there were two categories of stress variables: stressors and worries. In this survey, these items were all included in the same category for ease of comparison in the data. Participants were asked; "How much are each of the following adding to your stress during this time of isolation?" and then provided with each factor to rate on a five-point scale from no stress to extreme stress.

Three variables were added to the stress category for this survey: loneliness, grief, and my child(ren)'s return to school. Death of a loved one is a devastating experience no matter the circumstances under which it occurs. One participant in the CPIS succinctly described the experience of losing a loved one, in this case the father in the family, in the midst of a global pandemic, "The adjustment of a death is difficult in normal circumstances, but with the needs of the kids it becomes significantly more difficult and unique. Because of Covid, no one was, and still are not, available to really substantially help us work through it with the kids." A question was added to this survey asking whether the participant had experienced the loss of a loved one since the beginning of, or immediately prior to, the enactment of social isolation measures for Covid-19 and grief was added as a stress variable due to the impact that it has on individual's and family's emotional well-being.

A variable asking about the stress associated with child(ren)'s return to school was added to this survey to measure how much this unique situation was contributing to parents' stress levels. This study was timed intentionally to capture parents during the process of transitioning back into a new school year. One other factor was added to the stress variables in this study; participants were asked to rate their overall feelings of

loneliness on a scale of one (not at all lonely) to ten (extremely lonely). Loneliness has consistently been linked to negative physical and mental health outcomes including depression, compromised immune function, cognitive decline, and early mortality (Bhatti & Haq, 2017; Holt-Lunstad, 2017; Holt-Lunstad et al., 2015; Lara et al., 2019). This variable is of particular interest due to the social isolation incumbent in the Covid-19 pandemic.

Resilience. Some of the resilience questions differ between surveys as circumstances of the pandemic changed in the intervening months. There were questions on the CPIS that were based on the understanding at the time that isolation was going to be a short-lived measure. These questions were altered for the current study due to the updated understanding that isolation was a measure that was going to be in place for an indeterminable amount of time. For example, "I believe that my family will be okay throughout isolation" and "I believe that my family will be able to get back to normal once isolation is over" were measures of flexibility on the CPIS. These were changed to "My family is flexible when dealing with change" and "Looking back over the last 6 months of the pandemic, I believe that my family has adjusted well to the changing circumstances" on the CPSRS. Though the questions differed slightly, the underlying themes of the resilience factors remained the same. The question "I know what I need to be healthy during this time" was changed to "I am finding ways to take care of myself as well as my family" to reflect the concept of self-care which was noted by participants in the previous study as something they were struggling to find time for during isolation. Three questions were also added to assess participant self-regulation and participant-child coregulation.

Qualitative Measures. Data from the qualitative measures on the CPIS served to support and clarify the quantitative data and helped inform the design of this survey. Two of the three qualitative questions on the previous study related directly to experiences in isolation; these were removed from the current study. The final question asked: "Is there anything else that you would like us to know about the impact of Covid-19 and isolation of you and/or your family?" This question was included in the current study.

Education. In June of 2020, the Alberta government released a return to school plan including three scenarios for fall school reopening depending on the conditions of the Covid-19 pandemic at the time children should be returning to school (Alberta Education, 2020). On July 21, 2020 the Minister of Education for Alberta announced that the province would go ahead with scenario one, a near normal return to school with increased health measures (Alberta Education, 2020). Though this provincial declaration was made midway through the summer months, little detail was provided to parents, or even school districts, as to what this reopening would look like.

The CPSRS was timed intentionally around children's return to school in September of 2020. Questions were included regarding parents' experiences with the school system both in the spring of 2020 as the school year finished out, and as parents and schools were preparing for the fall semester. Prior to the fall semester, parents were required to select whether their children would be returning to school in person or continuing with online learning. In this study, parents were asked to identify which option they were choosing for their child(ren) for the fall and how much stress this decision caused them on a five-point scale from no stress to extreme stress. Parents were also asked how satisfied they were with support and communication from their school

districts, how satisfied they were with the return to school plan in their area, whether they felt that their needs regarding their child(ren)'s schooling were being heard, and what their biggest concerns were about their child(ren)'s return to school.

Stress Related Behaviours. The most significant change between the CPIS and the CPSRS is the addition of checklists of stress related behaviours. Responses from the first survey indicated that parents were dealing with high levels of stress in multiple areas of their lives, and the current study provides an opportunity to assess how this stress is manifesting in parents' own behaviours and those of their children. Stress is linked to anxiety, depression, psychosomatic symptoms, relational challenges, and other emotional and behavioural symptoms. It is also well documented that there is an intergenerational aspect to stress and mental health; that is, children who live with parents who are highly stressed pick up the stress signals from their parents and experience stress responses and exhibit stress behaviours themselves (Bowers & Yehuda, 2016; Hammen et al., 2012; Toepfer et al., 2017).

The symptoms of anxiety and depression are well documented in the literature and there are many valid and reliable scales that can be used to diagnose these disorders. However, many of these measures require in depth interviewing and/or review by a licenced psychologist. This study was not concerned with diagnosis, but overall patterns of stress behaviours in the population. For these reasons, commonalities from the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013), Beck Depression Inventory-II (Beck et al., 1996), Generalized Anxiety Disorder Scale-7 (Spitzer et al., 2006), and *Spence Children's Anxiety Scale* (Spence, 1997) were taken and put into plain language. For example, "regressive

behaviours" are a common indicator of stress in children. This was reworded to "acting below their age" for ease of understanding in a general population.

Participants were asked to select which behaviours they "regularly (once a week or more often)" experienced pre-Covid-19 and which ones they experienced regularly now. They were then asked to fill out the same checklist for their partners. For their child(ren), participants were asked "In the past six months has your child experienced any of the following?" As children's nervous systems and behaviours are more sensitive to stress than adults, and assessments of mental health and stress in children do not require the same stability of symptoms in children, parents were asked about the presence of each behaviour in the previous six months and frequency markers were included in the behaviours (ie: frequent headaches, increased arguments with siblings). Parents were able to answer the checklist for up to three children in their family.

Participants were asked how much stress each family member's behaviours were causing them, if anyone in the family was on psychiatric medications, and if there were any diagnoses that may explain some of the behaviours. Finally, participants were asked to rate both their own and their partner's (if applicable) substance use over the previous six months on a five-point scale from significantly decreased to significantly increased.

Analysis

Means, standard deviations, and percentages were calculated for demographic variables as appropriate. T-tests were used to determine if there were variations in stress levels between independent groups with two categories (ie: living in a household with an individual who was immunocompromised or not) and analysis of variance was used in cases with three or more categories (ie: parenting status). Correlational analysis examined

the relationship between stress variables, parenting variables, and resilience variables. EFA was used to determine the underlying factor structure for both stress and resilience variables. Pre- and post-pandemic frequencies were calculated for participant stress behaviours and chi-square tests were used to determine population changes in prevalence of individual behaviours. Frequencies were also calculated for child stress related behaviours and child behaviours were compared to parent behaviours post-pandemic. All quantitative data analysis was done using IBM SPSS Statistics (Version 22.0).

Results

Demographics

Age showed no correlation to current stress levels, r = -.10 [-.278, .077], p = .259, nor to feelings of loneliness, r = .02 [-.156, .199], p = .808. The effect of gender on levels of loneliness and current stress levels was analysed using independent samples t-tests between self-identified males and females as no participants in this study identified as non-binary or gender fluid. Men (M = 6.5, SD = 3.1) and women (M = 5.5, SD = 2.4) reported similar levels of loneliness in this study, $t(121) = -1.01$, p = .313, d = -0.42. There was a small significant effect of gender on current stress levels, $t(119) = -1.98$, p = .050, d = -0.83, suggesting that men (M = 8.8, SD = 1.5) were reporting higher levels of current stress than were women (M = 7.2, SD = 2.0). Though the significance value only just reaches the cut-off, the effect size for this difference was large. However, it should be noted that the sample sizes between men (n = 6) and women (n = 117) were substantially different in this data set.

Only one participant self-identified as indigenous in this study and thus this participant was included with the other participants who identified as ethnically diverse.

There was no significant difference in current stress levels between those participants who self-identified as Caucasian (M = 7.4, SD = 1.9) and those self-identifying as ethnically diverse (M = 6.4, SD = 2.7), t(15.07) = 1.32, p = .208, d = 0.49. There was also no significant effect of ethnicity on feelings of loneliness, t(105) = 1.76, p = .081, d = 0.51. However, the effect size was moderate suggesting that there may be a difference in feelings of loneliness between those identifying as Caucasian (M = 5.6, SD = 2.4) and ethnically diverse populations (M = 4.4, SD = 3.0)

Health

Independent samples t-tests were conducted to determine whether living in a household with someone in a vulnerable health category had any impact current stress, loneliness, or stress associated with health-related variables. Living in a household with an individual who had a significant disability, chronic illness, or immunocompromised status (yes or no) were each analyzed as independent variables. Outcome variables included: current stress level, feelings of loneliness, level of stress associated with one's own health, level of stress associated with the health of one's family members, level of stress associated with access to food and medications, level of stress associated with access to other essentials, level of stress associated with caring for elderly relatives, and level of stress associated with grief. All three independent variables showed a significant effect on current stress levels, but only living in a household with someone with a significant disability showed a significant effect on feelings of loneliness (Table 14). Living in a household with someone with a health vulnerability had significant impacts on several health-related stress variables. Full results can be found in Table 14.

Table 14

Comparison of Current Stress Levels, Loneliness, and Health-Related Stress Variables Among Participants with Household Members in Vulnerable Health Categories

	Yes		No				
Household Health Vulnerability	*M* (*n*)	*SD*	*M* (*n*)	*SD*	*t*(DF)	*p*	*d*
Household health vulnerability impacts on current stress levels[a]							
Significant disability	8.8 (21)	1.2	6.9 (102)	2.0	-4.20 (121)	< .001	-1.01
Chronic illness	8.1 (34)	1.8	6.9 (88)	2.0	-3.06 (120)	.003	-0.62
Immunocompromised	8.2 (30)	1.7	6.9 (92)	2.0	-3.22 (120)	.002	-0.68
Household health vulnerability impacts on feelings of loneliness[b]							
Significant disability	6.7 (22)	2.3	5.2 (103)	2.4	-2.68 (123)	.008	-0.63
Chronic illness	6.0 (35)	2.4	5.3 (89)	2.5	-1.34 (122)	.183	-0.27
Immunocompromised	5.9 (31)	2.4	5.4 (93)	2.5	-1.07 (122)	.287	-0.22
How much is your own health adding to your stress?[c]							
Significant disability	2.9 (22)	1.3	2.1 (95)	1.0	-2.78 (27.13)	.010	-0.77
Chronic illness	2.8 (32)	1.3	2.0 (84)	0.9	-3.19 (42.35)	.003	-0.78
Immunocompromised	2.6 (29)	1.4	2.1 (87)	1.0	-1.76 (37.42)	0.87	-0.45
How much is the health of your family members adding to your stress?[c]							
Significant disability	3.2 (22)	1.6	2.2 (93)	1.0	-2.74 (24.83)	.011	-0.87
Chronic illness	3.9 (32)	1.4	2.2 (82)	1.0	-2.93 (44.06)	.005	-0.71
Immunocompromised	3.1 (29)	1.6	2.2 (85)	0.9	-2.91 (34.95)	.006	-0.80
How much is access to food/medications adding to your stress?[c]							
Significant disability	1.9 (18)	1.1	1.4 (79)	0.8	-2.27 (95)	.025	-0.59
Chronic illness	1.7 (29)	1.0	1.4 (67)	0.8	-1.78 (94)	.078	-0.40
Immunocompromised	1.6 (24)	1.1	1.5 (72)	0.8	-0.62 (94)	.539	-0.15
How much is access to other essentials (ie: diapers, formula, medical supplies) adding to your stress?[c]							
Significant disability	2.2 (20)	1.1	1.4 (74)	0.7	-3.14 (23.72)	.004	-1.00
Chronic illness	2.0 (29)	1.0	1.3 (64)	0.7	-3.29 (41.95)	.002	-0.83
Immunocompromised	2.0 (25)	1.1	1.4 (68)	0.8	-2.36 (33.95)	.024	-0.64
How much is caring for elderly relatives adding to your stress?[c]							
Significant disability	3.1 (10)	2.0	1.7 (58)	1.0	-2.21 (9.72)	.052	-1.24
Chronic illness	2.4 (21)	1.6	1.6 (46)	1.0	-2.22 (27.42)	.035	-0.69
Immunocompromised	2.4 (16)	1.8	1.7 (52)	1.0	-1.62 (18.37)	.123	-0.60
How much is grief adding to your stress?[c]							
Significant disability	2.4 (14)	1.4	1.6 (70)	1.1	-2.40 (82)	.019	-0.70
Chronic illness	2.2 (25)	1.5	1.5 (58)	0.9	-2.41 (32.66)	.022	-0.69
Immunocompromised	2.3 (20)	1.4	1.5 (64)	1.0	-2.54 (25.64)	.027	-0.71

Note: Household health vulnerability could refer to any member of the household. Participants were not asked to specify. [a]Mean is based on a ten-point scale from not at all stressed to extremely stress. [b]Mean is based on a ten-point scale from not at all lonely to extremely lonely. [c]Means are based on a five-point scale from no stress to extreme stress.

A total of 16.0% of participants reported having experienced the death of someone close to them since March 1, 2020. Of those who answered yes, 10% reported that this death was related to Covid-19. Participants who reported having experienced the death of someone close to them (M = 8.1, SD = 1.9) reported higher levels of stress than those who did not (M = 7.1, SD = 2.0), $t(121) = -1.99$, $p = .049$, $d = 0.49$. Only one person in this study reported that someone in their household had been diagnosed with Covid-19.

When asked if anyone in their family or household had had significant health treatments postponed due to Covid-19, 21.6% of participants responded yes. Participants who reported having a family or household member who had significant health treatments postponed due to Covid-19 (M = 8.1, SD = 2.0) reported higher levels of current stress than did participants who did not (M = 7.0, SD = 2.0), $t(121) = -2.56$, $p = .012$, $d = 0.56$.

In the CPIS, participants reported that losing access to counselling had significant impacts on their stress levels and mental well-being. In the current study, 32.0% of participants reported that someone in their family had been accessing counselling prior to the beginning of the Covid-19 public health measures. Of those who responded yes, 62.5% reported that they, or their family/family member, had lost access to the service they had been utilizing due to lockdown measures. Of those who reported losing access, only 28.0% reported that they had been able to re-access this service. The reasons participants reported for not re-accessing services include:

- cannot afford due to lost income/benefits,
- cannot access due to limited professionals,

- the service that I was accessing has been shut down,
- online services are not a fit,
- cannot get a hold of providers,
- on a waitlist, and
- not ready to re-access/no longer need the service

Employment and Finances

At the time of the survey, 35.2% of participants reported that their employment had been impacted in some way by Covid-19 and 23.2% reported their partner's employment had been impacted, including 8.8% and 4.0% respectively who left work or reduced their hours in order to care for their child(ren) or other family members. A total of 12.8% of participants reported that both their and their partner's employment had been impacted by Covid-19 and the subsequent public health measures. Of those participants who reported having their employment impacted by Covid-19, only 31.8% reported that they had returned to their pre-Covid-19 employment status. This number was 30.3% for partner's returning to their pre-Covid-19 employment status at the time of the survey. Full employment characteristics for this study can be found in Table 15.

Table 15

Characteristics of Employment for CPSRS Participants and Their Partners

Employment Variable	*n* (*N* = 125)	%
Has your employment and/or income been impacted due to Covid-19?		
My hours were reduced	6	4.8
I was laid off	14	11.2
I was self-employed and my income potential has been reduced	6	4.8
I was self-employed and am no longer generating income	2	1.6
My hours have increased	5	4.0
My employment status remains the same	75	60.0
I have left or reduced work to care for children or other family	11	8.8
Missing	6	4.8
If your employment was impacted, have you returned to your initial employment status?		
No	29	65.9
Yes	14	31.8
Missing	1	2.3
If married/common law, has your partner's employment been impacted due to Covid-19?		
My partner's hours were reduced	11	8.8
My partner was laid off	4	3.2
My partner is self-employed and their income potential has been reduced	10	8.0
My partner is self-employed and they are no longer generating income	0	0.0
My partner's hours have increased	4	3.2
My partner's employment status remains the same	76	60.8
My partner has left or reduced work to care for children or other family	5	4.0
Not applicable/Missing	15	12.0
If your partner's employment was impacted, have they returned to their initial employment status?		
No	23	69.7
Yes	10	30.3
Missing	0	0.0

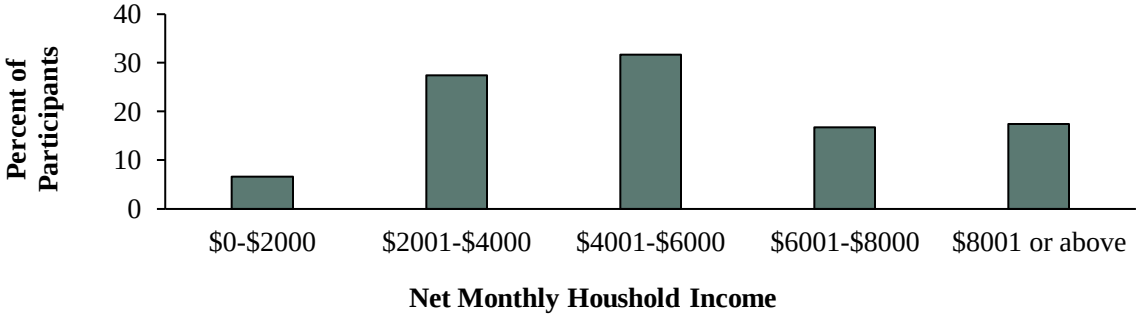
A one-way analysis of variance (ANOVA) was conducted to determine effects of participant and partner employment impacts on current stress levels. Participants who were self-employed and were no longer generating income were excluded from this analysis due to small sample size (n = 2). There were no significant effects of participant employment impacts on current levels of stress, $F(5, 114) = 0.75$, $p = .585$, $\omega^2 = -.01$.

There were also no significant impacts of partner employment impacts on participant stress levels, $F(5, 102) = 0.64$, $p = .673$, $\omega^2 = -.02$. In this study, 16.8% of participants reported losing health or medical benefits due to lost or reduced employment status. Having lost health or medical benefits was not significantly related to current stress levels, $t(111) = -1.40$, $p = .165$, $d = -0.35$.

When asked to report their net monthly household income, 6.7% of participants reported a monthly income below $2000, 75.8% reported a monthly income between $2001 and $8000, and 17.5% reported a monthly income above $8001. Monthly income distributions for participants can be found in Figure 8. There was a small significant negative correlation between household income and current stress levels, $r = -.05$ [-.348, .002], $p = .053$, such that as household income decreased, current stress levels increased. There was a large negative correlation between household income and financial stress, $r = -.35$ [-.502, -.170], $p < .001$, such that as household income decreased, financial stress increased. Trendlines for current stress and income and financial stress and income can be found in Figure 9.

Figure 8

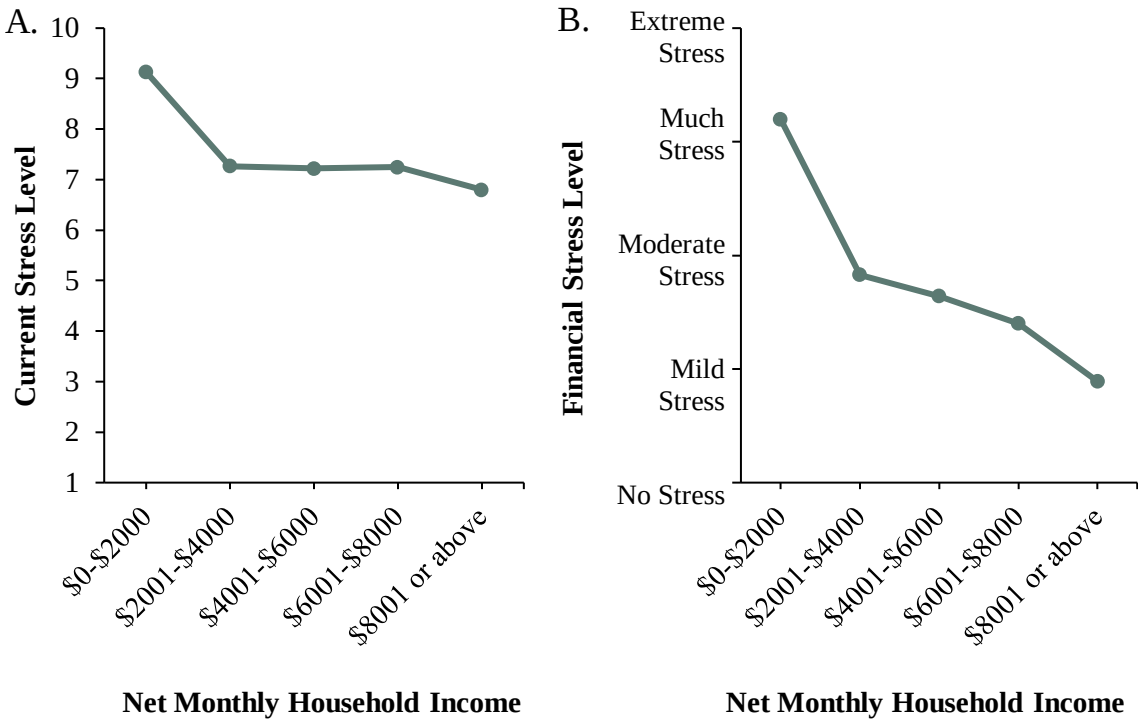
Net Monthly Household Income



Note: Distribution of participant's monthly household income is shown by percentage of participants in each income category.

Figure 9

Current Stress and Financial Stress by Net Monthly Household Income



Note: Panel A: Trend of current stress level by net monthly household income. Panel B: Trend of financial stress by net monthly household income.

When asked who, if anyone, in their household was receiving CERB benefits, 79.5% reported that no one in the household was receiving CERB. The 20.5% of participants who reported that someone in the household was receiving CERB was split between participants (13.9%), partners (5.6%), and one participant reporting that both they and their partner were receiving CERB. A one-way ANOVA showed that there was no significant difference in current stress levels between participants in households receiving CERB and households who were not, $F(3, 116) = 0.30$, $p = .826$, $\omega^2 = -.018$.

Nor was there any effect of a household member receiving CERB on financial stress levels, $F(3, 107) = 01.69$, $p = .173$, $\omega^2 = .018$.

Parenting

Children in this study ranged from newborn to 22-years-old (dependent adult children), with an average child age of 6.6 years. As the majority of participants reported more than one child in the household ($n = 263$), a composite number was created for each family to represent the age of children in the household. This composite was developed in the same way as in the CPIS. The full conversion can be found in Table 4.

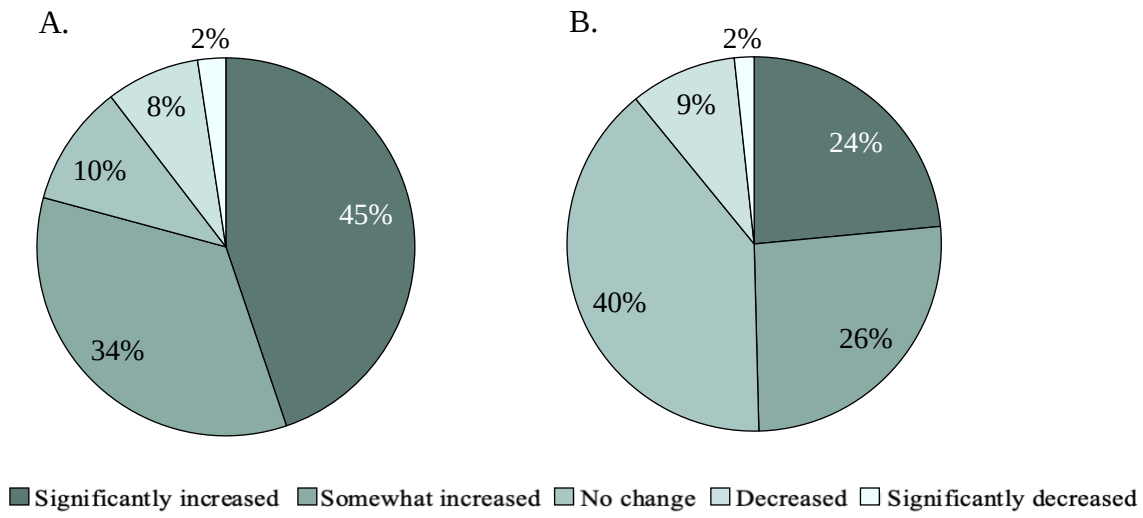
Each participant was assigned a point number based on the age and number of children in their household. There was no significant correlation between point number assigned to represent age of child(ren) in the household and current stress levels, $r = -.036$ [-.212, .143], $p = .694$, nor between number of children in the household and current stress level, $r = -.072$ [-.246, .107], $p = .432$.

When asked to describe their parenting situation, 87.8% of participants identified that they were living full time with their partner and child(ren), 4.9% reported that they were a single parent caring for their child(ren) full time, 4.1% reported shared custody, 2.4% were caring for someone else's child(ren), and 0.8% reported that their partner works away from home for days or weeks at a time. For the purpose of assessing impact of parenting situation on stress level, those whose partners were working away ($n = 1$) were excluded from the analysis of variance due to low response rate. The one-way ANOVA revealed that there was no significant effect of parenting situation on current stress levels, $F(3, 119) = 0.37$, $p = .773$, $\omega^2 = .00$, nor on feelings of loneliness, $F(3, 118) = 1.14$, $p = .337$, $\omega^2 = -.02$.

The CPIS found that social isolation measures enacted to prevent the spread of Covid-19 had significantly impacted how much time parents were spending with their child(ren). In the current study, participants reported significant increases in the time they spent with their child(ren) as well as the amount of time their partner (if applicable) was spending with the child(ren) (Figure 10). Neither changes in the amount of time that participants were spending with their child(ren), r = .03, [-.174, .227], p = .778, nor changes in partner's time spent with the child(ren), r = -.06, [-.261, .140], p = .545) were significantly correlated with current stress levels.

Figure 10

Impacts of Isolation on Time with Child(ren) and Partner's Time with Child(ren)



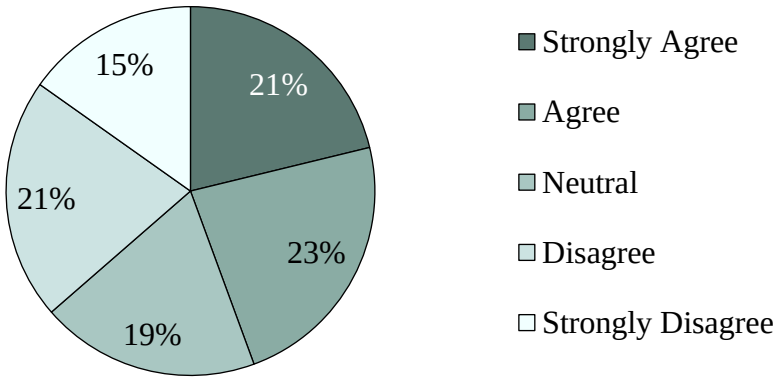
Note: Panel A: depicts distribution of participant responses to the question, "How has isolation impacted the amount of time you spend with your child(ren)?" Pie chart B depicts distribution of participant responses to the question, "How has isolation impacted the amount of time your partner spends with your child(ren)?"

Children's Education

In the CPIS, 89.0% of participants with school-aged children reported that they were currently attempting at-home schooling with their child(ren). In the current study, 90.4% of participants with school-aged children reported that they had attempted to provide at home learning for their child(ren) in the spring of 2020. Of these parents, 44.4% reported that they were satisfied with the support they received in helping their child(ren) finish out the 2020 school year, while 36.4% reported that they were unsatisfied with the support they received. Full distributions of responses to school support satisfaction can be found in Figure11.

Figure 11

Parent Satisfaction with School Support in Spring Semester 2020



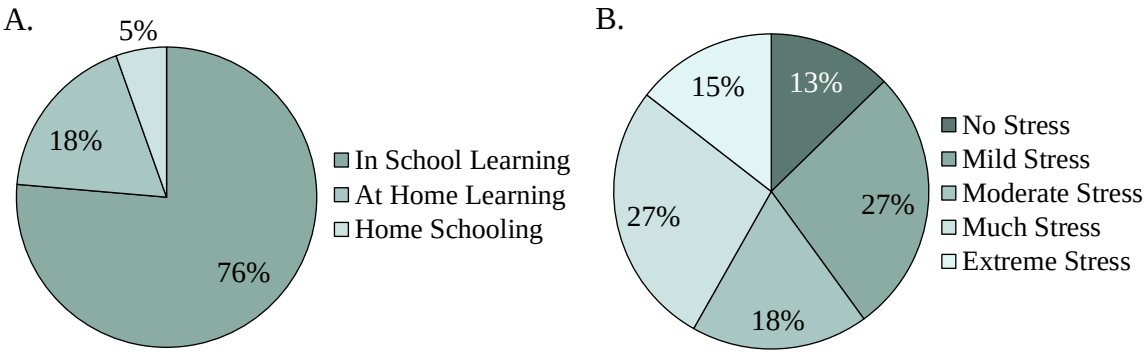
Note: Distribution of responses to the statement, "I was satisfied with the support I received in helping my child(ren) to finish out the school year."

In Alberta, parents were required to select a schooling option for their children for the fall of 2020: in school learning, at home learning, or home schooling. Distribution of fall learning options can be found in Figure 5. Parents were asked how much stress the

decision regarding fall school had caused them on a five-point scale from no stress to extreme stress. Only 12.7% of parents reported that this decision had caused them no stress, while 41.8% of parents reported that the decision caused them much or extreme stress (Figure 12). A one-way ANOVA showed that the option parents selected for the fall had a significant impact on the stress associated with making that decision, $F(2, 107) = 16.98$, $p < .001$, $\omega^2 = -.23$. Bonferroni post hoc tests showed that parents who chose at home learning ($M = 4.4$, $SD = 0.9$) experienced significantly more stress around the decision than did parents who chose in school learning ($M = 2.7$, $SD = 1.2$), $p < .001$. There was no significant difference between groups for those parents who chose to homeschool their child(ren) ($M = 3.2$, $SD = 1.2$) (Figure 13).

Figure 12

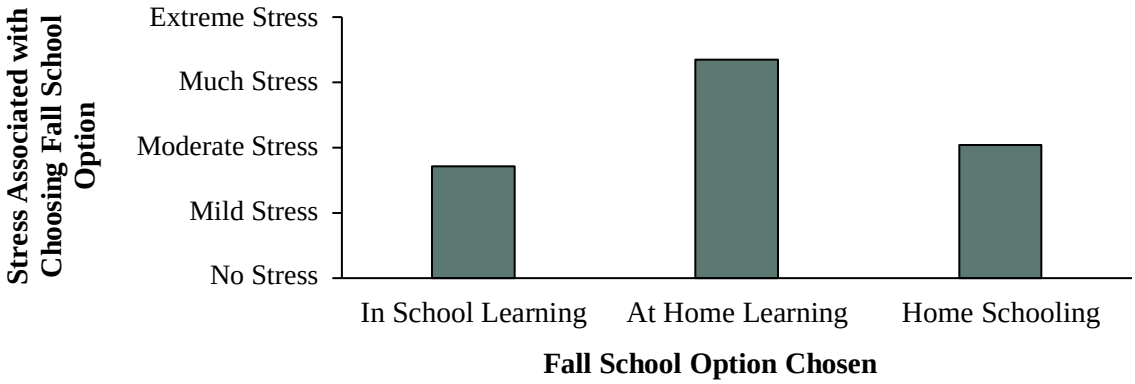
Fall School Choice and Stress Associated with the Decision



Note: Pie chart A: Distribution of participant responses to the question, "Which option did you select for your child(ren) for fall of 2020?" Pie chart B: Distribution of participant responses to the question, "How much stress did this decision cause you?"

Figure 13

Stress Associated with the Decision About Fall Schooling by Option Chosen



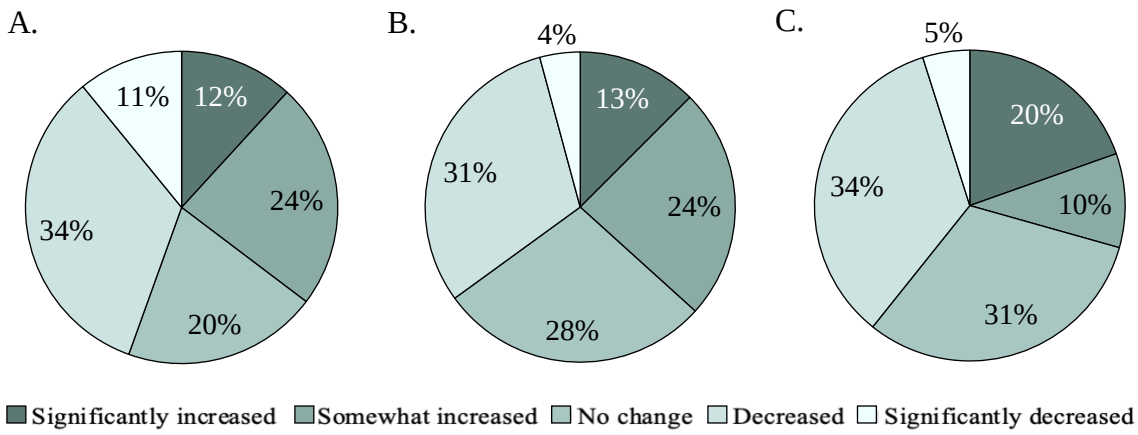
Note: Average amount of stress associated with the decision about fall school options sorted by the option parents chose for their child(ren).

Participants were asked how satisfied they had been with the communication provided about school programming in the fall of 2020, how satisfied they were with the plan that is currently in place in their division for reopening schools, and whether they feel as though their needs and concerns regarding their child(ren)'s schooling have been heard. A total of 44.5% of participants reported that they were satisfied with the communication regarding fall programming, 35.3% were unsatisfied, and 20.2% reported they were neutral (Figure 14). Regarding the return to school plan in their school division, only 35.0% reported that they were satisfied, while 36.7% reported they were dissatisfied and 28.3% reported that their feelings about the fall school plans in their division were neutral (Figure 14). A total of 39.2% of parents reported that they felt their needs and concerns were being heard, 31.4% of parents reported that they did not feel as though their needs were being heard, and 31.4% remained neutral (Figure 14). Participant's satisfaction with communication about fall programming, satisfaction with

return to school plans, and feelings regarding their needs and concerns being heard were highly correlated to lower levels of current stress, stress about their child(ren)'s education, and stress regarding their child(ren)'s return to school (Table 16).

Figure 14

Parent Satisfaction with Fall School Communication, Re-Opening Plans, and Having Their Needs and Concerns Heard



Note: Pie chart A: Distribution of participant responses to the statement, "I have been satisfied with the communication provided about school programming in the fall of 2020." Pie chart B: Distribution of participant responses to the statement, "I am satisfied with the plan that is currently in place in my division for re-opening schools." Pie Chart C: Distribution of participant responses to the question, "Do you feel as though your needs and concerns regarding your child(ren)'s schooling have been heard?"

Table 16

Descriptive Statistics and Correlations for Child(ren)'s Education and Return to School Variables

Variable	*n*	*M*	*SD*	1	2	3	4	5	6
1. Current Stress[a]	123	7.2	2.0	—					
2. Stress - My Child(ren)'s Education[b]	119	3.1	1.3	.423***	—				
3. Stress - My Child(ren)'s Return to School[b]	113	3.0	1.3	.376***	.769***	—			
4. School Communication Satisfaction[c]	119	2.9	1.2	.295**	.454***	.514***	—		
5. Satisfaction with Return to School Plan[c]	120	3.1	1.1	0.042	.290**	.361***	.522***	—	
6. My Needs/Concerns are Being Heard[c]	102	3.1	1.2	.236*	.399***	.485***	.619***	.753***	—

[a]Mean is based on a ten-point scale. [b]Means are based on a five-point scale from no stress to extreme stress? [c]Means are based on a five-point scale from strongly agree to strongly disagree.

*p < .05. **p < .01. ***p < .001.

Participants who responded that they did not feel as though their needs and concerns were being heard were asked who they would like to have listening to them. The majority (63.3%) identified that they would like the provincial government, including the health and education ministers, to be hearing their concerns. Following the provincial government, participants named principals, school districts, and funders as those whom they would like to hear their concerns. Some participants expressed that, within weeks or days of returning to school, that they still did not know what the plan was for their child(ren).

Participants were asked to identify what specific concerns they were experiencing regarding their child(ren)'s return to school. The full breakdown of participant responses can be found in Table 17. In addition to the concerns listed in Table 17, one participant noted that they were worried about increased stress levels in teachers, and another

expressed concern about financial aid for themselves and others who were choosing to keep their children home from in person learning.

Table 17

Participants' Concerns About Their Child(ren)'s Return to School

What concerns are you experiencing about your child(ren) returning to school?	*n*	%
I am not concerned about the return to school	12	9.6
Class sizes	52	41.6
Social distancing	58	46.4
Cleaning protocols	42	33.6
Exposure to many different people	60	48.0
Screen time	21	16.8
Lack of devices in the home	3	2.4
Lack of alternate childcare and/or supervision	20	16.0
Impact on social development	61	48.8
Impact on educational development	49	39.2
Child's health	57	45.6
Personal health	46	36.8
My family members' health	37	29.6
How I will get time off work/find childcare if my child(ren) are sent home from school for 14 days	57	45.6
How many days my child(ren) will miss if they are quarantined from school	61	48.8
Working while my child(ren) are doing at-home learning	36	28.8
Being available to support my child(ren)'s at home learning	41	32.8
Doing at home learning without the school supports my child needs	25	20.0
Lost school supports due to budget cuts and layoffs	49	39.2

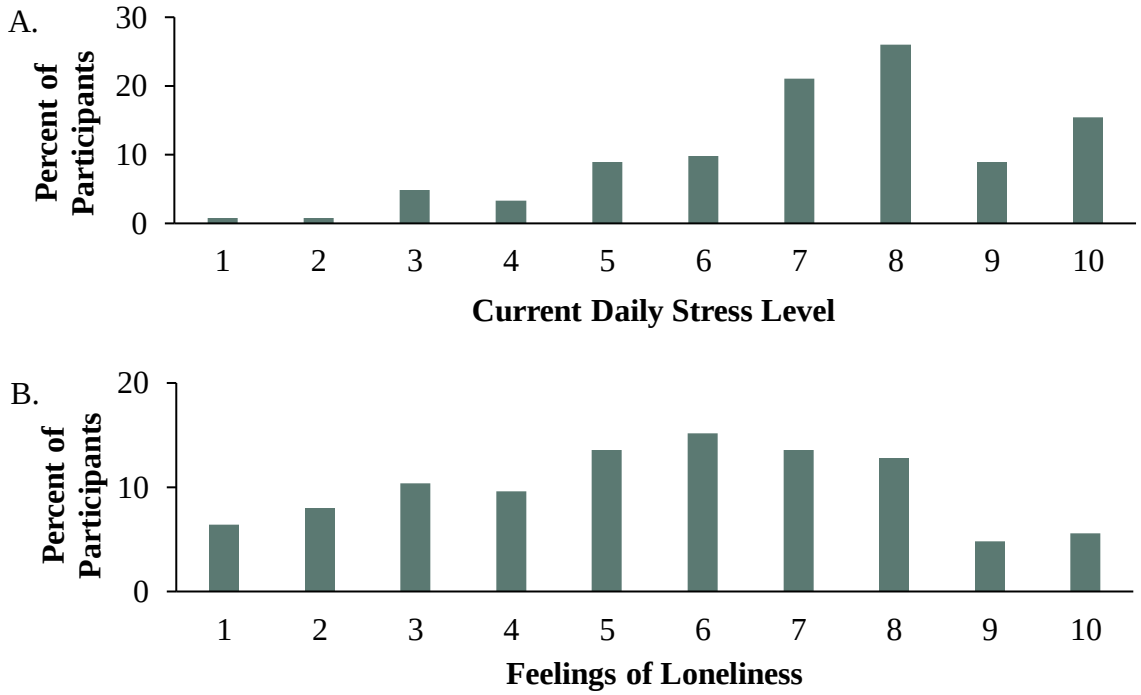
Stress

Participants were asked to rate their current stress level on a ten-point scale from not at all stressed to extremely stressed and to identify how Covid-19 had impacted their feelings of loneliness on a ten-point scale from not at all lonely to extremely lonely. Participants reported high levels of current stress, with 71.4% reporting a stress level

between seven and ten. Participants also reported high levels of loneliness, with 36.8% reporting that their feelings of loneliness were between a seven and a ten. See Figure 15 for full distribution of reported stress and loneliness.

Figure 15

Distribution of Current Stress Levels and Feelings of Loneliness

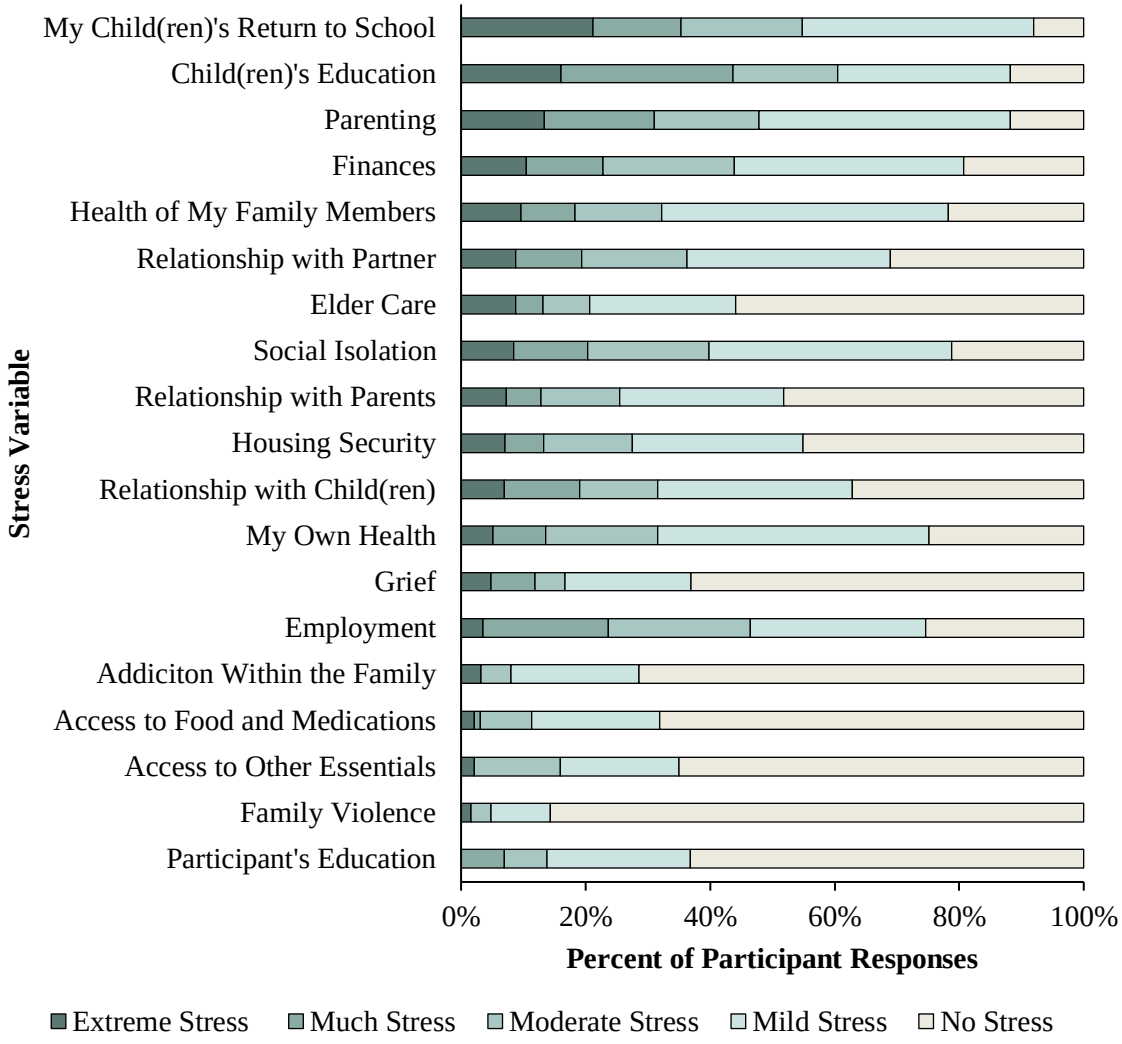


Note: Bar graph A: Participants' responses to the question, “Please rate your current stress level?” Bar graph B: Participants’ responses to the question, “How would you rate your overall feelings of loneliness?”

Nineteen questions were coded as stress variables in this survey. My child(ren)’s education was reported to be adding the most stress for parents (*M* = 3.1, *SD* = 1.3), followed by my child(ren)’s return to school (*M* = 3.0, *SD* = 1.3), parenting (*M* = 2.9, *SD* = 1.2), and finances (*M* = 2.6, *SD* = 1.2). The full distribution of responses for stress variables can be found in Figure 16.

Figure 16

Distribution of Responses to Stress Variables CPSRS



Note: Distribution of participant responses to the question, "How much are each of the following adding to your stress during this time of isolation?" for each of the associated variables.

Correlations were conducted to determine relationships between stress variables, current stress levels, and loneliness. Only two stress variables did not show significant correlations to current stress levels: family violence (r = .130, p = .316) and addiction within the family (r = -.12, p = .336). All other stress variables showed statistically

significant correlations to current stress. Three variables had correlation coefficients indicating a moderate-large relationship with current stress: parenting ($r = .60$, $p < .001$), relationship with my child(ren) ($r = .55$, $p < .001$), and finances ($r = .51$, $p < .001$). Loneliness and stress were highly correlated to one another, $r = .53$, $p < .001$, as were loneliness and social isolation, $r = .50$, $p < .001$. Demographics and full correlation matrix for stress variables can be found in Table 18.

Table 18

Descriptive Statistics and Correlations for Stress Variables CPSRS

Stress Variable	*n*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Current Stress[a]	123	7.2	2.0	—											
2. Loneliness[a]	125	5.5	2.5	.528***	—										
3. Finances[b]	114	2.6	1.2	.513***	.229*	—									
4. Employment[b]	114	2.5	1.2	.441***	.226*	.440***	—								
5. Housing Security[b]	113	2.0	1.2	.387***	.311**	.755***	.415***	—							
6. Participant Education[b]	87	1.6	0.9	.223*	.283**	.251*	.355**	.294**	—						
7. My Child(ren)'s Education[b]	119	3.1	1.3	.423***	.124	.438***	.379***	.380***	.335**	—					
8. Relationship with My Partner[b]	113	2.3	1.3	.473***	.351***	.487***	.303**	.531***	.367**	.304**	—				
9. Relationship with My Parents[b]	110	2.0	1.2	.318**	.156	.382***	.245*	.505***	.202	.418***	.535***	—			
10. Relationship with My Child(ren)[b]	119	2.2	1.2	.523***	.353***	.412***	.316**	.379***	.207	.550***	.554***	.409***	—		
11. Social Isolation[b]	118	2.5	1.2	.428***	.504***	.336***	.204*	.425***	.397***	.496***	.417***	.445***	.578***	—	
12. Parenting[b]	119	2.8	1.3	.595***	.324***	.406***	.345***	.390***	.302**	.704***	.494***	.374***	.693***	.623***	—

Stress Variable	*n*	*M*	*SD*	1	2	13	14	15	16	17	18	19	20	21
1. Current Stress[a]	123	7.2	2.0	—										
2. Loneliness[a]	125	5.5	2.5	.528***	—									
13. Caring for Elderly Relatives[b]	68	1.9	1.3	.284*	.307*	—								
14. Grief[b]	84	1.7	1.1	.334**	.419***	.679***	—							
15. My Child(ren)'s Return to School[b]	113	3.0	1.3	.376***	.130	.345**	.254*	—						
16. Family Violence[b]	63	1.2	0.7	.130	.229	.054	.142	-.120	—					
17. Addiction Within the Family[b]	63	1.4	0.9	-.124	.063	.281*	.362**	.129	.529***	—				
18. My Own Health[b]	117	2.3	1.1	.428***	.355***	.276*	.427***	.265**	.312*	.410**	—			
19. Health of My Family Members[b]	115	2.4	1.2	.427***	.315**	.498***	.481***	.378***	.231	.157	.637***	—		
20. Access to Food and Medications[b]	97	1.5	0.9	.254*	.142	.336*	.454***	.115	.136	.468***	.333**	.380***	—	
21. Access to Other Essentials[b]	94	1.6	0.9	.411***	.165	.538***	.564***	.236*	.102	.434**	.319**	.426***	.775***	—

[a] Range = 1-10 [b] Range = 1-5

*p < .05. **p < .01. ***p < .001.

Independent samples t-tests were conducted to determine if there was an effect of gender or ethnicity on any of the stress variables, with gender as the independent variable and each stress variable as a separate outcome measure. Men reported higher stress levels associated with finances, employment, housing security, social isolation, and health of one's family members than did women (Table 19). There was no significant effect of ethnicity on any of the stress variables.

Table 19

Stress Variable by Gender Comparison

	Women		Men				
	M (*n*)	*SD*	*M* (*n*)	*SD*	*t*(DF)	*p*	*d*
Finances	2.5 (106)	1.2	4.0 (6)	0.9	-2.96(110)	.004	-1.24
Employment	2.4 (106)	1.1	4.0 (6)	0.9	-3.35(110)	.001	-1.41
Housing Security	2.0 (105)	1.2	3.3 (6)	1.6	-2.73(109)	.007	-1.15
My Child(ren)'s Education	3.1 (111)	1.3	3.7 (6)	1.8	-1.12(115)	.265	-0.47
Relationship with my Partner	2.4 (105)	1.3	2.3 (6)	1.2	0.05(109)	.957	0.02
Relationship with my Parents	2.0 (103)	1.2	2.2 (5)	1.1	-0.39(106)	.698	-0.18
Relationship with my Child(ren)	2.2 (111)	1.3	2.8 (6)	1.0	-1.20(115)	.234	-0.50
Social Isolation	2.4 (110)	1.2	3.7 (6)	1.4	-2.53(114)	.013	-1.06
Parenting	2.8 (111)	1.2	3.3 (6)	1.2	-1.01(115)	.316	-0.42
Child(ren)'s Return to School	3.0 (106)	1.3	3.8 (5)	1.6	-1.32(109)	.190	-0.60
My Health	2.2 (111)	1.0	3.2 (5)	1.8	-1.21(4.121)	.291	-0.91
Health of my Family Members	2.3 (107)	1.2	3.5 (6)	1.4	-2.36(111)	.020	-0.99
Access to Food and Medications	1.5 (90)	0.9	1.8 (5)	1.1	-0.81(93)	.418	-0.37
Access to Other Essentials	1.6 (87)	0.9	1.8 (5)	1.1	-0.60(90)	.549	-0.28

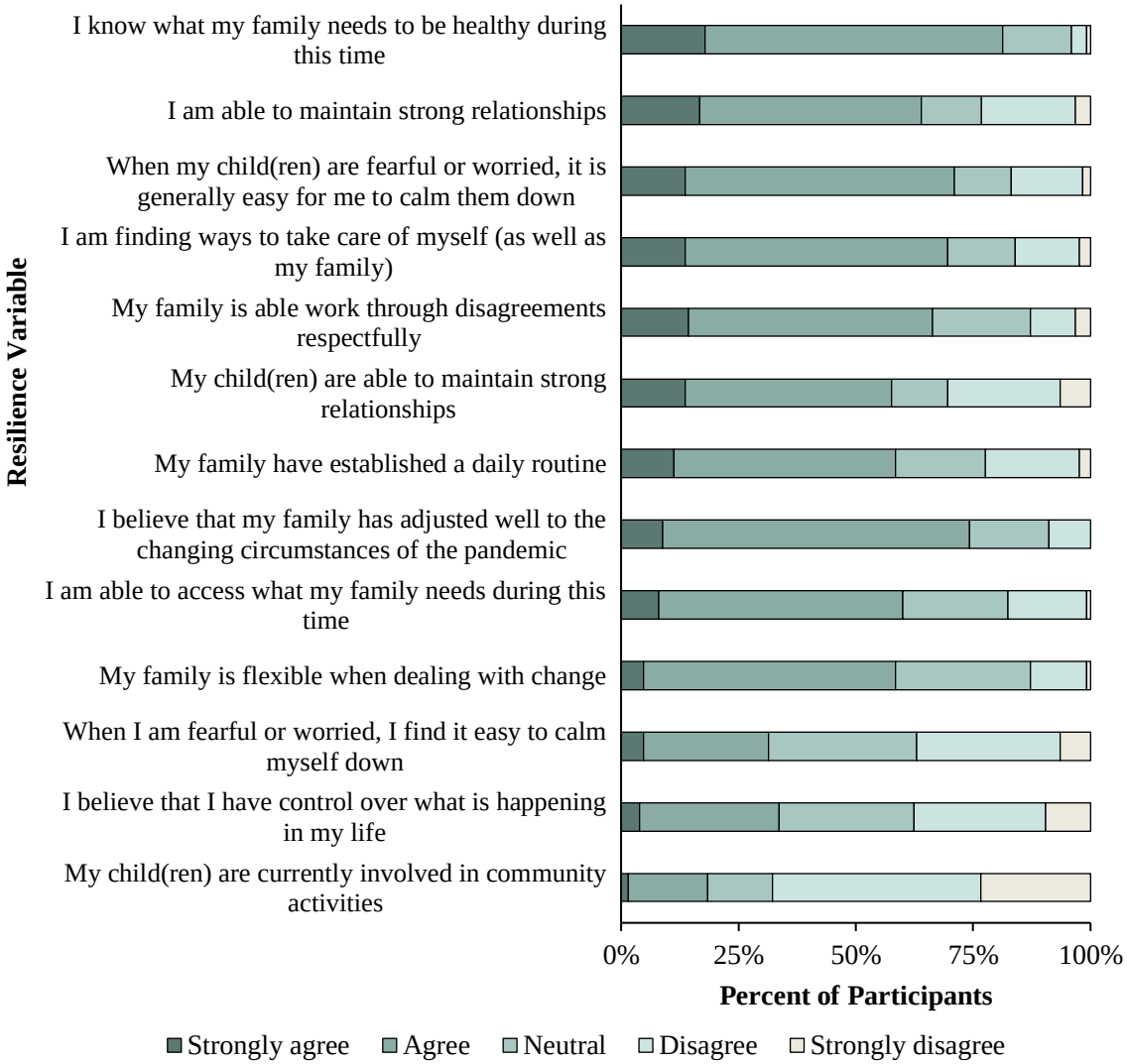
Note: Means are based on a five-point scale from no stress to extreme stress. Variables with less than 5 male participants reporting are not included in analysis.

Resilience

Fifteen variables were coded as resilience variables in this study. The full distribution of responses for resilience variables can be found in Figure 17.

Figure 17

Distribution of Responses to Resilience Variables CPSRS



Note: Distribution of participant responses to resilience variables. Participants were asked to respond to each statement on a five-point scale from strongly agree to strongly disagree.

Correlations were conducted to determine relationships between resilience variables, current stress levels, and feelings of loneliness. Only two resilience variables did not show significant correlations to current stress levels: “My child(ren) are currently involved in community activities that they enjoy (dance, church groups, sports, etc.)” (r = .10, p = .280) and “In our household we express our feelings safely” (r = -.12, p = .207). All other resilience variables showed statistically significant correlations to current stress. Nine variables showed significant correlations to feelings of loneliness, most notably, “When I am fearful or worried, I find it easy to calm myself down” (r = .45, p < .001) and “I am able to maintain strong relationships with the important people in my life” (r = .44, p < .001). Demographics for resilience variables can be found in Table 10 and a full correlation matrix for resilience variables can be found in Table 11. None of the resilience variables in this study showed any effect of gender or ethnicity.

Table 20

Descriptive Statistics and Correlations for Resilience Variables CPSRS

Resilience Variable	*n*	*M*	*SD*	1	2	22	23	24	25	26	27	28	29
1. Current Stress[a]	123	7.2	2.0	—									
2. Loneliness[a]	125	5.5	2.5	.528***	—								
22. I am able to maintain strong relationships with the important people in my life[b]	125	2.5	1.1	.248**	.437***	—							
23. My child(ren) are able to maintain strong relationships with the important people in their lives[b]	125	2.7	1.2	.208*	.356***	.725***	—						
24. My child(ren) are currently involved in community activities that they enjoy (dance, church groups, sports, etc)[b]	124	3.7	1.1	.099	.168	.285**	.404***	—					
25. My family have established a daily routine[b]	125	2.6	1.0	.319***	.252**	.275**	.325***	.379***	—				
26. I believe that I have control over what is happening in my life[b]	125	3.1	1.1	.457***	.381***	.382***	.404***	.413***	.470***	—			
27. I am finding ways to take care of myself (as well as my family)[b]	125	2.4	1.0	.436***	.357***	.454***	.402***	.317***	.363***	.522***	–		
28. My family is able work through disagreements respectfully[b]	125	2.4	1.0	.293**	.374***	.388***	.348***	.135	.332***	.270**	.348***	—	
29. I know what my family needs to be healthy during this time[b]	123	2.1	0.8	.297**	.358***	.275**	.300**	.099	.161	.278**	.604***	.499***	—

Resilience Variable	*n*	*M*	*SD*	1	2	30	31	32	33	34	35	36
1. Current Stress[a]	123	7.2	2.0	—								
2. Loneliness[a]	125	5.5	2.5	.528***	—							
30. I am able to access what my family needs during this time[b]	125	2.5	0.9	.448***	.405***	—						
31. My family is flexible when dealing with change[b]	125	2.5	0.8	.324***	.306**	.330***	—					
32. When I am fearful or worried, I find it easy to calm myself down[b]	124	3.1	1.0	.452***	.445***	.292**	.460***	—				
33. When my child(ren) are fearful or worried, it is generally easy for me to calm them down[b]	124	2.3	1.0	.213*	.158	.272**	.489***	.488***	—			
34. I know how to comfort my child(ren) when they are upset[b]	123	1.9	0.7	.238**	.115	.211*	.366***	.318***	.650***	—		
35. In our household we express our feelings safely[b]	123	2.1	0.8	.115	.124	.315***	.331***	.165	.466***	.551***	—	
36. Looking back over the last 6 months of the pandemic, I believe that my family has adjusted well to the changing circumstances[b]	124	2.3	0.7	.221*	.228*	.322***	.436***	.202*	.381***	.323***	.510***	—

[a] Range = 1-10 [b] Range = 1-5

*p < .05. **p < .01. ***p < .001.

In addition to the significant correlations of both stress and resilience variables to current stress levels and loneliness, there were also statistically significant correlations between stress variables and resilience variables. Two resilience variables showed moderate-large relationships to parent-child relationship stress: "I am able to access what my family needs during this time" ($r = .54$, $p < .001$) and "I believe that I have control over what is happening in my life" ($r = .51$, $p < .001$). "I am able to access what my family needs during this time" also showed a moderate-large relationship with the stress associated with participant's personal health ($r = .51$, $p < .001$).

Stress variables and resilience variables were averaged into a composite stress score and a composite resilience score for each participant. Participants were then assigned to a low, moderate, or high stress category and a low, moderate, or high resilience category based on their composite score (1.0-2.5 = low, 2.5-3.5 = moderate, 3.5-5.0 = high). However, a univariate analysis could not be conducted due to small group sizes (two groups with less than two participants, two others with less than five). One-way ANOVAs were conducted in lieu of the univariate analysis to determine main effects. There was a significant main effect of stress category on current stress level, $F(2, 119) = 19.55$, $p < .001$, $\omega^2 = .24$. Games-Howell post hoc tests indicated that current stress was significantly lower in the low stress group ($M = 6.6$, $SD = 2.0$) than in both the moderate stress group ($M = 8.3$, $SD = 1.2$), $p < .001$ and the high stress group ($M = 9.7$, $SD = 0.7$), $p < .001$. Current stress was also lower in the moderate stress group than in the high stress group, $p < .001$.

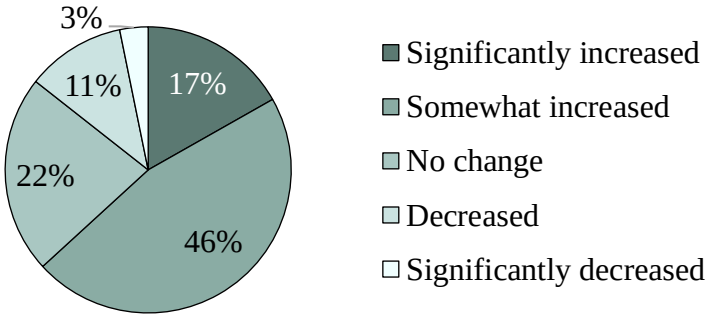
There was a significant main effect of resilience category on current stress level, $F(2, 120) = 15.40$, $p < .001$, $\omega^2 = .11$. Bonferroni post hoc tests indicated that current

stress was significantly lower in the high resilience group (M = 6.5, SD = 2.0) than in both the moderate resilience group (M = 7.8, SD = 1.6), $p < .001$ and the low resilience group (M = 9.4, SD = 1.1), $p < .001$. Current stress was also lower in the moderate resilience group than in the low resilience group, $p = .046$.

When asked how isolation impacted the amount of time that the family spends playing together 63.2% of participants reported that the time spent playing as a family had increased or significantly increased, 22.4% reported that this time had decreased or significantly decreased, and 16.4% reported that their family play time had not changed (Figure 18). There was a small significant negative correlation between family play time and current stress, $r = -.27$, $p = .003$, such that as family play time increased, reported levels of current stress decreased.

Figure 18

Distributions of Family Play Time



Note: Distribution of participant responses to the question, "How has isolation impacted the amount of time your family spends playing together?"

Exploratory Factor Analysis

Stress. An EFA was conducted on those variables that were coded in this study as stress variables. Two stress variables were excluded due to insignificant correlation with

levels of overall stress: family violence (r = .13, p = .152) and addiction within the family (r = -.12, p = .168). Analysis of the initial factor extraction was conducted with factor loadings below .50 being suppressed due to sample size (N = 125) (Hair et al., 2009). Results of Bartlett's test of sphericity indicate that the correlation matrix was not random, χ^2 (153) = 594.60, $p < 0.001$, and the Kaiser-Meyer-Olkin (KMO) measure verified sampling adequacy for the analysis, KMO = .765. The final factor structure revealed seven variables loaded onto two factors that explain 71% of the variance. Table 21 depicts the final factor model.

Table 21

Final Factor Extraction CPSRS Stress Variables

Stress Variable	Rotated Factor Matrix	
	Factor Loading	
	1	2
Factor 1: Attachment Disruptions		
13. Caring for Elderly Relatives	**.873**	.223
9. Relationship with My Parents	**.731**	.319
14. Grief	**.718**	.142
6. Relationship with my partner	**.507**	.251
Factor 2: Parenting		
7. My Child(ren)'s Education	.237	**.865**
15. My Child(ren)'s Return to School	.195	**.833**
10. Relationship with My Child(ren)	.379	**.513**

Note: n = 234. The extraction method was maximum likelihood with a Varimax rotation with Kaiser Normalization. Factor loadings over .500 appear in bold and variables are sorted by highest loading.

Resilience. An EFA was also conducted on the resilience variables in this study. Two resilience variables were excluded from this analysis due to insignificant correlation with levels of overall stress: "My child(ren) are currently involved in community

activities that they enjoy (dance, church groups, sports, etc.)" (r = .10, p = .140) and "In our household we express our feelings safely" (r = -.12, p = .104). Analysis of the initial factor extraction was conducted with factor loadings below .50 being suppressed due to sample size (N = 125) (Hair et al., 2009). Results of Bartlett's test of sphericity indicate that the correlation matrix was not random, χ^2 (91) = 724.60, $p < 0.001$, and the Kaiser-Meyer-Olkin (KMO) measure verified sampling adequacy for the analysis, KMO = .794. The final factor structure revealed eight variables loaded onto two factors and explain 63% of the variance. Table 22 depicts the final factor model.

Table 22

Final Factor Extraction CPSRS Resilience Variables

Resilience Variable	Rotated Factor Matrix Factor Loading 1	 2
Factor 1: Agency		
23. My child(ren) are able to maintain strong relationships with the important people in their lives	**.834**	.087
22. I am able to maintain strong relationships with the important people in my life	**.792**	.154
27. I am finding ways to take care of myself (as well as my family)	**.546**	.250
30. I am able to access what my family needs during this time	**.536**	.224
26. I believe that I have control over what is happening in my life	**.521**	.211
Factor 2: Co-Regulation		
34. I know how to comfort my child(ren) when they are upset	.108	**.848**
33. When my child(ren) are fearful or worried, it is generally easy for me to calm them down	.211	**.732**
26. My family is able work through disagreements respectfully	.369	**.576**

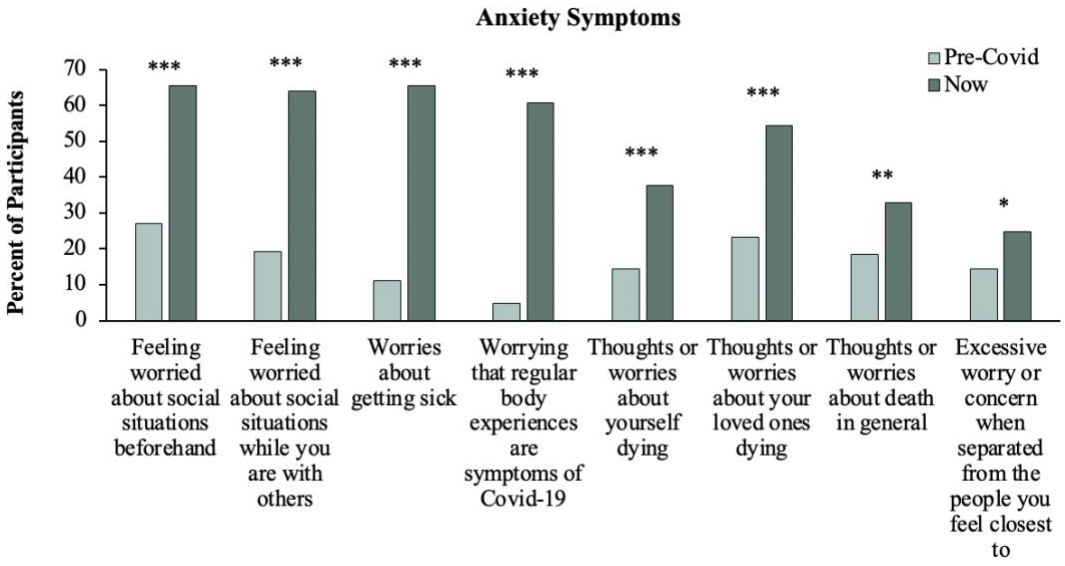
Note: n = 435. The extraction method was maximum likelihood with a Varimax rotation with Kaiser Normalization. Factor loadings over .500 appear in bold and variables are sorted by highest loading.

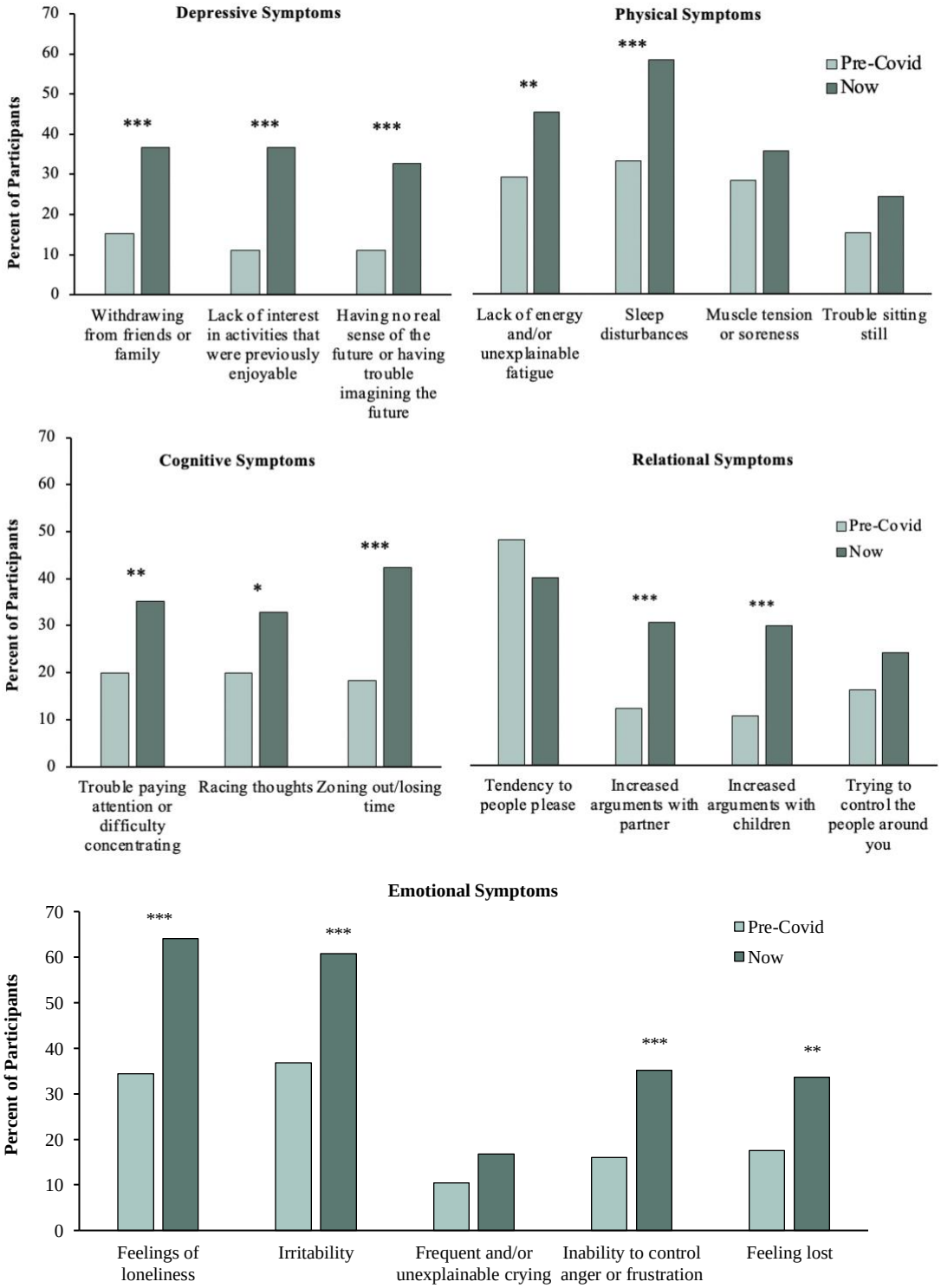
Stress Related Behaviours

Parents. Participants in this study were provided with 28 stress-related behaviours and asked to select which behaviours they experienced once a week or more frequently prior to the Covid-19 pandemic, and which behaviours they experienced once a week or more frequently at the time of the survey. The prevalence of stress related behaviours in this sample increased significantly from pre-Covid-19 to post-Covid-19. The largest increases were seen in individuals worrying that regular body experiences are symptoms of Covid-19, worrying about getting sick, worrying about social situations while with others, and loss of interest in activities that were previously enjoyable. Only one behaviour, tendency to people please, showed a decrease in prevalence from pre-Covid-19 to the time of the study. Pre- to post-Covid changes for all stress related behaviours can be found in Figure 19.

Figure 19

Participant Stress Related Behaviours Pre-Covid-19 to Present



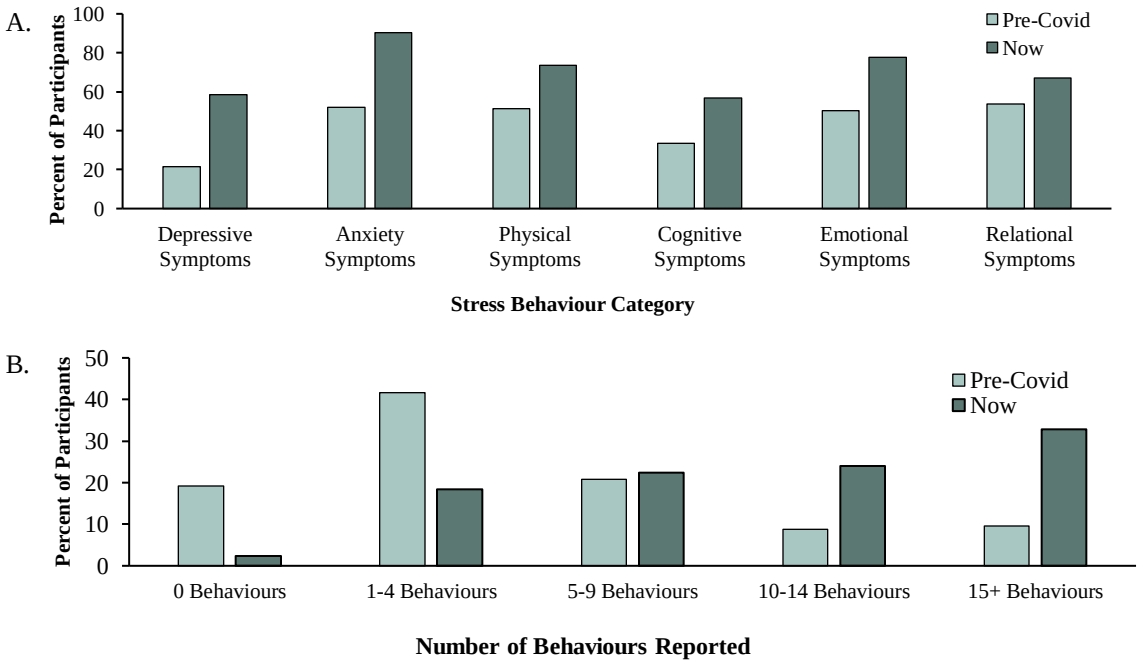


Note: Figure depicts comparisons of each stress-related behaviour from pre-Covid-19 to the time of the study. Significance is based on Chi-Square analyses of distribution from pre-Covid-19 to the time of the survey.
*$p < .05$. **$p < .01$. ***$p < .001$.

Participants showed a significant increase in the number of stress-related behaviours they reported from pre- to post-Covid-19. The most significant increases were seen in depressive and anxiety symptoms (Figure 20). Participants reported an average of 5.4 stress-related behaviours prior to Covid-19 and an average of 11.2 behaviours at the time of the study. Only one participant reported no change in behaviours and 5.7% reported a decrease in stress behaviours from pre-Covid-19 to the time of the survey. A total of 17.9% of participants reported none of the listed behaviours prior to Covid-19, but did report behaviours at the time of the study. Numbers of individually reported stress-related behaviours pre-Covid-19 to the time of the study can be found in Figure 20.

Figure 20

Stress Related Behaviours by Category and Total Number of Behaviours from Pre-Covid-19 to the Present



Note: Bar graph A: Percent of participants reporting one or more behaviours by category of stress related behaviours pre-Covid-19 to the time of the study. Bar graph B: Number of stress-related behaviours per participant pre-Covid-19 to the time of the study.

There was a strong significant correlation between current stress levels and number of stress-related behaviours at the time of the study, $r = .54$ [.406, .658], $p < .001$. All categories of stress-related behaviours correlated independently to current stress levels. The category of stress behaviour most highly correlated to current stress levels was emotional symptoms, followed by relational symptoms. Full correlations can be found in Table 23.

Table 23

Descriptive Statistics and Correlations for Current Stress and Stress Related Behaviours by Category

Category of Stress Behaviour	*n*	*M*	*SD*	1	2	3	4	5	6	7
1. Current Stress[a]	123	7.2	2.0	—						
2. Depressive Symptoms[b]	125	1.1	1.1	.410***	—					
3. Anxiety Symptoms[c]	125	4.1	2.5	.336***	.387***	—				
4. Physical Symptoms[d]	125	1.6	1.3	.367***	.520***	.427***	—			
5. Cognitive Symptoms[b]	125	1.1	1.2	.415***	.529***	.497***	.623***	—		
6. Emotional Symptoms[e]	125	2.1	1.7	.572***	.652***	.448***	.645***	.692***	—	
7. Relational Symptoms[d]	125	1.2	1.1	.471***	.500***	.413***	.574***	.525***	.636***	—

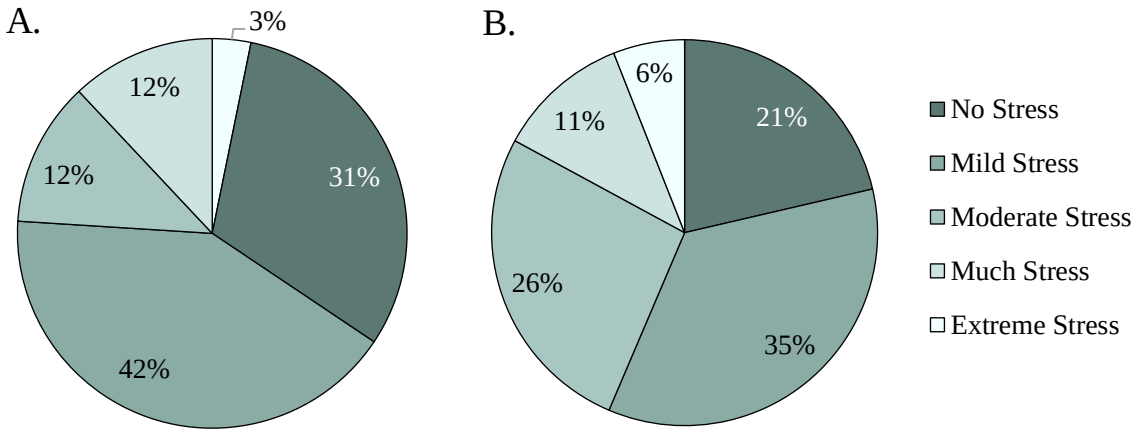
[a]Range = 1-10 [b]Range = 1-3 [c]Range = 1-8 [d]Range = 1-4 [e]Range = 1-5
*$p < .05$. **$p < .01$. ***$p < .001$.

Participants reported that the behaviours they were experiencing were causing them moderate to high amounts of stress (Figure 21) There was a significant correlation between the number of behaviours participants reported experiencing and the stress that they reported associated with these behaviours, $r = .68$ [.575, .766], $p < .001$. There was also a significant correlation between the amount of stress participants associated with their stress-related behaviours and their reports of current stress levels, $r = .66$ [.548,

.750], $p < .001$. Participants were also asked how much stress they were experiencing due to their partner's stress-related behaviours (Figure 21). There was a moderate significant correlation between the amount of stress that participants associated with their partner's behaviours and their own self-reports of current stress levels, $r = .42$ [.259, .562], $p < .001$. Due to a significant amount of missing data on partner's specific stress-related behaviours, this data was not subjected to further analysis.

Figure 21

Amount of Stress Associated with Participants' Own Stress-Related Behaviours and the Stress-Related Behaviours of Their Partners



Note: Pie chart A: Stress associated with participants personal stress-related behaviours/symptoms. Pie chart B: Participants' stress associated with their partners' stress-related behaviours/symptoms.

When asked about medication for anxiety or depression, 22.6% of participants responded that they were taking medications for anxiety or depression and 9.4% reported that their partner was taking medication. Participants reported increases in alcohol use over the course of the pandemic with 33.6% of participants reporting somewhat or significantly increased personal alcohol use and 28.7% reporting somewhat or significant

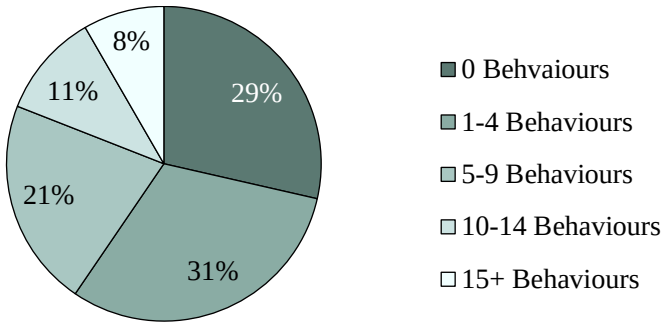
increases in alcohol use in their partners. Only 0.9% reported significantly decreased alcohol use for themselves, and 2.8% somewhat or significantly decreased partner alcohol use. A total of 7.8% of participants reported somewhat or significantly increased cannabis use for themselves and 7.9% somewhat or significantly increased cannabis use for their partners. Meanwhile, 2.0% of participants reported significantly decreased cannabis use for themselves, and 1.0% for their partners. Smoking (nicotine) behaviours remained quite stable with only 3.9% of participants reporting somewhat or significantly increased smoking for themselves and 7.2% for their partners. Only 2.0% of participants and 1.0% of partners significantly decreased their smoking behaviours during Covid-19. No participants in this study reported any change in use of illicit substances.

Children. In this study, parents were asked to report on the stress-related behaviours they had seen in their child(ren) since the declaration of the Covid-19 pandemic and beginning of public health measures in Canada. Participants were able to report stress-related behaviours for up to three children in their household. As many families had more than one child, the total number of children reported on is significantly higher than that of individual participants. To determine the total number of children to use as a baseline for statistical analysis, the number of children in each household was compared to the number of children for whom the parent reported on. The total number of children used for analysis in this portion of the study is 252.

A total of 71.4% of children were reported to be exhibiting at least one stress-related behaviour, with 40.5% of children exhibiting five or more stress-related behaviours and 28.6% of children not exhibiting any of the stress-related behaviours listed (Figure 22). The average number of stress behaviours per child was 6.9.

Figure 22

Number of Stress-Related Behaviours per Child

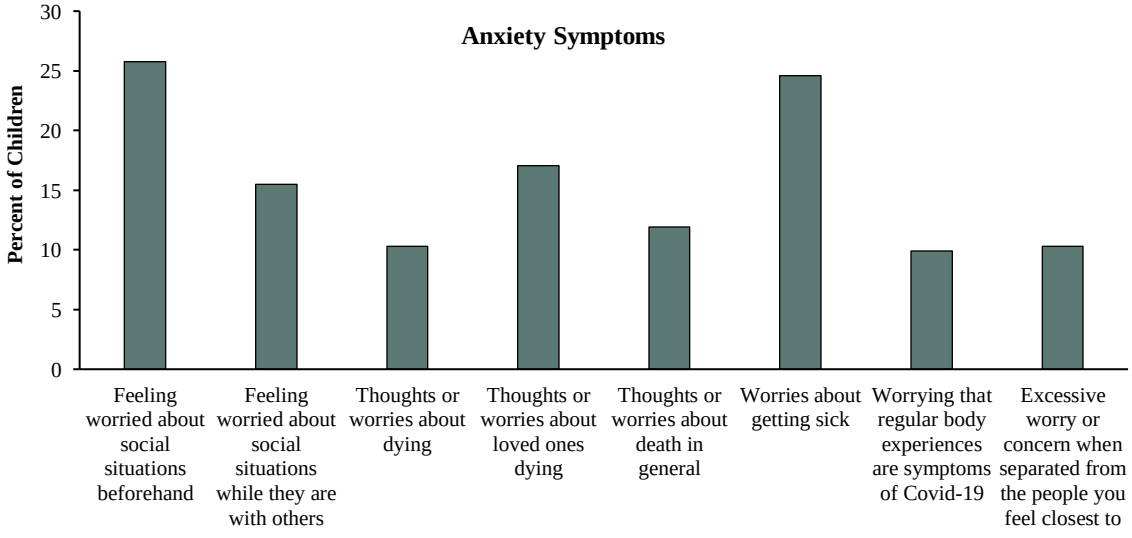


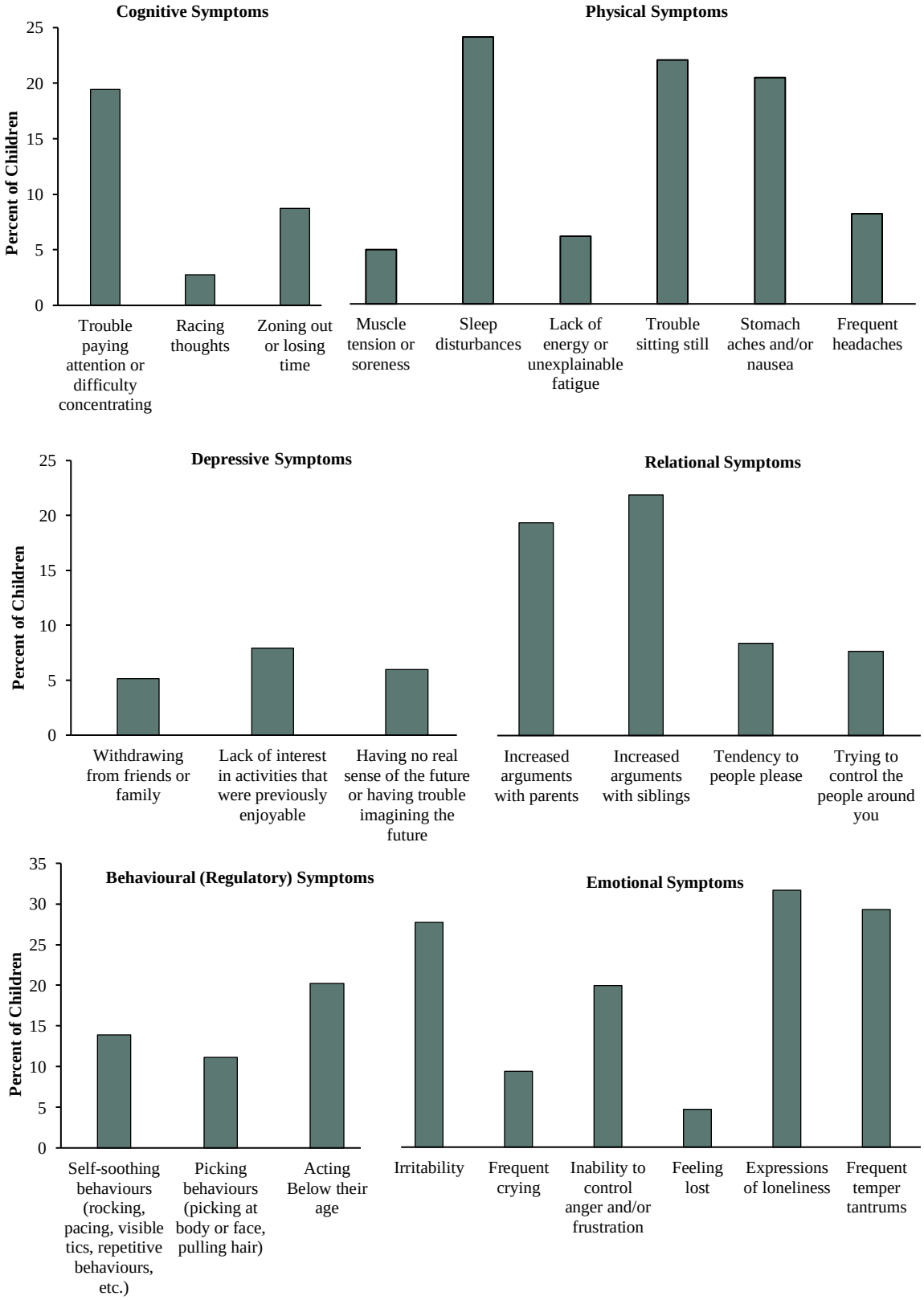
Note: Number of stress related behaviours children in this study had exhibited over the previous six months of the Covid-19 pandemic in percentages.

The most commonly reported stress-related behaviour in children in this study was expressions of loneliness (32.1%), followed by frequent temper tantrums (29.8%), and irritability (28.2%). Full distribution of stress-related behaviours for children in this study can be found in Figure 23.

Figure 23

Stress Related-Behaviours in Children During the Covid-19 Pandemic





Note: Percentages of children who have exhibited each stress-related behaviour (as reported by their parent or caregiver) at some point during the course of the Covid-19

There was a moderate significant correlation between the number of stress-related behaviours participants reported experiencing themselves, and the number of behaviours that participants reported seeing in their child(ren), $r = .50$ [.397, .584], $p < .001$. There was a small significant correlation between the number of stress-related behaviours participants reported for their child(ren) and their self-reports of current stress levels, $r = .26$ [.136, .369], $p < .001$. There were also small but significant correlations between the number of stress-related behaviours exhibited by a child and the parent's report of parenting stress, $r = .31$ [.193, .420], $p < .001$, and stress associated with the parent-child relationship, $r = .37$ [.253, .471], $p < .001$.

Each category of child stress-related behaviours showed significant correlation to current stress levels, parenting stress, and parent-child relationship stress (Table 24). Parents and children showed similar patterns of stress-related behaviours, though for parents, anxiety symptoms were the most commonly reported, while for children it was emotional symptoms (Figure 24). Comparison of parent to child stress-related behaviour categories showed significant correlations between the symptoms that parents were reporting for themselves, and those they were observing in their children (Table 25).

Table 24

Descriptive Statistics and Correlations for Current Stress, Parent-Child Relationship Stress, Parenting Stress, and Child Stress-Related Behaviours by Category

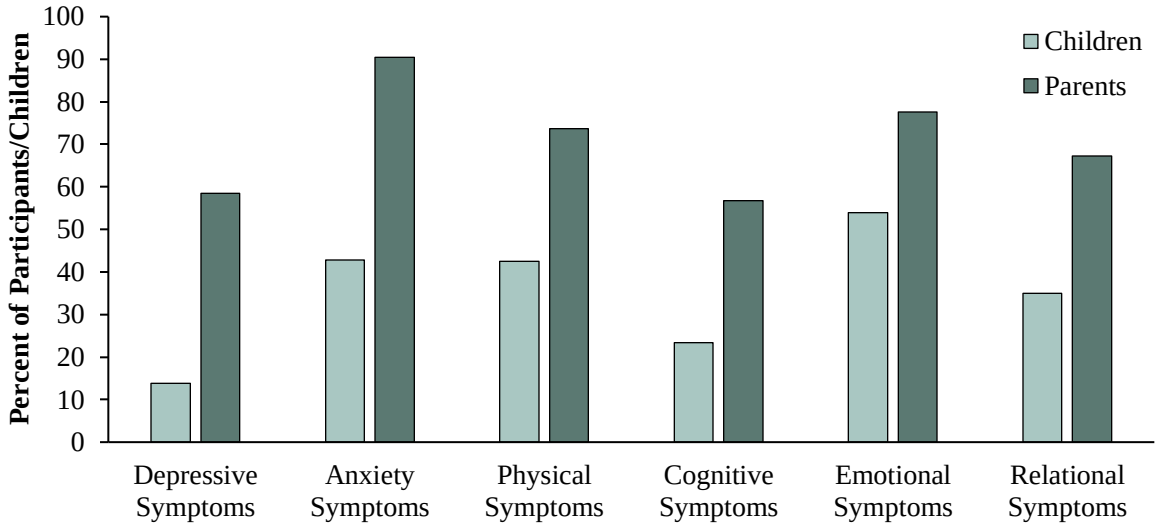
Variable	*n*	*M*	*SD*	1	2	3
1. Current Stress[a]	247	7.1	2.0	—		
2. Parent-Child Relationship Stress[b]	243	2.2	1.2	.523***	—	
3. Parenting Stress[b]	244	2.8	1.2	.603***	.699***	—
4. Child Anxiety Symptoms[c]	252	1.3	1.9	.132*	.247***	.223***
5. Child Depressive Symptoms[d]	252	0.2	0.5	.197**	.320***	.263***
6. Child Physical Symptoms[e]	252	0.8	1.2	.220***	.307***	.180**
7. Child Cognitive Symptoms[d]	252	0.3	0.6	.171**	.261***	.233***
8. Child Emotional Symptoms[e]	252	1.3	1.5	.206***	.313***	.250***
9. Child Relational Symptoms[f]	252	0.6	2.0	.296***	.313***	.356***
10. Child Behavioural Symptoms[d]	252	0.5	0.8	.172**	.194**	.164*

Note: Correlations between child stress-related behaviours are not shown.
[a]Range = 1-10 [b]Range = 1-5 [c]Range = 1-8 [d]Range = 1-3 [e]Range = 1-6 [f]Range = 1-6

*p < .05. **p < .01. ***p < .001.

Figure 24

Parent and Child Stress Related Behaviours by Category



Note: Figure 18 depicts percentages of parent and child stress-related behaviours in each category at the time of the survey. In order to be included in the category, the parent or child must exhibit one or more behaviours in the category.

Table 25

Correlations for Parent and Child Stress-Related Behaviour Categories

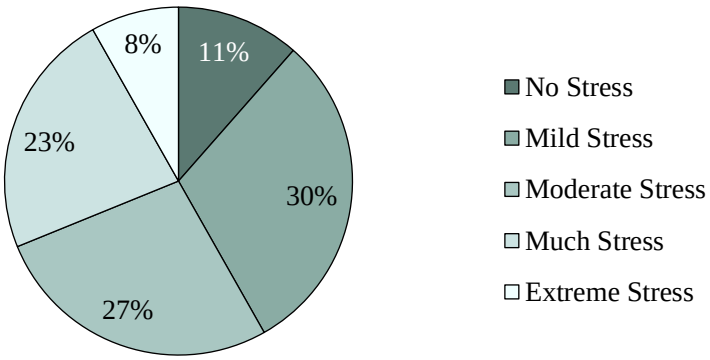
Variable	Parent Stress-Related Behaviours					
	Anxiety Symptoms	Depressive Symptoms	Physical Symptoms	Cognitive Symptoms	Emotional Symptoms	Relational Symptoms
Child Anxiety Symptoms	.312***	.182**	.243***	.091	.228***	.242***
Child Depressive Symptoms	.151	.272***	.289***	.231***	.303***	.357***
Child Physical Symptoms	.299***	.369***	.442***	.307***	.386***	.391***
Child Cognitive Symptoms	.238***	.342***	.365***	.323***	.347***	.308***
Child Emotional Symptoms	2.66***	.336***	.434***	.219***	.379***	.396***
Child Relational Symptoms	.188**	.296***	.414***	.163**	.349***	.428***
Child Behavioural Symptoms	.328***	.339***	.364***	.194**	.258***	.223***

*$p < .05$. **$p < .01$. ***$p < .001$.

Only 3.2% of participants reported that one of their children was taking medication for anxiety or depression. Parents varied widely in the levels of stress they associated with their child(ren)'s behaviours; 11.5% reported no stress associated with their child(ren)'s behaviours while 31.2% reported much or extreme stress associated with their child(ren)'s behaviours (Figure 25).

Figure 25

Parent Stress Associated with Child Stress-Related Behaviours



Note: Parent stress associated with child's stress-related behaviours/symptoms.

Between Study Results

Methods

The CPIS was conducted between May 8, 2020 and June 15, 2020 during the peak of government mandated public health and stay-at-home orders. The CPSRS was conducted two months later between August 25, 2020 and September 13, 2020 during a period of lessened restrictions and coincided with children returning to school for the first time since the beginning of the pandemic. Each survey stands alone in the data that it collected about the experiences of parents during the Covid-19 pandemic. However, the two surveys were designed using many of the same questions to allow for comparison of parental experience across the first four months of the Covid-19 pandemic.

Participants

In order to compare parent experiences from May/June 2020 to August/September 2020, participant demographics were compared between the two studies to ensure that the samples were similar enough to run further comparison. There were 440 participants in the CPIS and 125 in the CPSRS, so sample sizes differed significantly. However, there was no significant difference between parent ages, $t(551) = -0.15$, $p = .874$, $d = -0.02$ or number of children in the household, $t(543) = 0.78$, $p = .436$, $d = 0.08$. There was a small difference in average age of children between the two studies such that children represented in the CPIS ($M = 7.3$, $SD = 4.6$) were slightly older than children represented in the CPSRS ($M = 6.6$, $SD = 4.6$), $t(1170) = 2.11$, $p = .035$, $d = 0.15$. However, average age difference was less than a year and the effect size of this difference was small.

Chi-Square tests were conducted to determine if there were significant differences between the participants from the CPIS and CPSRS on any of the categorical

demographic variables. Gender did not differ significantly between CPIS and CPSRS, X^2 (3, N = 561) = 3.23, p = .357. There was a small significant difference in ethnicities between CPIS and CPSRS, X^2 (2, N = 494) = 7.40, p = .025; participants in the CPSRS were more likely to be ethnically diverse than participants in the CPIS. There was no significant difference in caregiving status between participants in the CPIS and CPSRS, X^2 (5, N = 563) = 2.96, p = .706. The full comparison of demographic characteristics between the CPIS and CPSRS can be found in Table 26.

Table 26

Characteristics of Study Participants for CPIS and CPSRS

	CPIS		CPSRS	
Variable	*n* (*N* = 440)	%	*n* (*N* = 125)	%
Age (y)				
18-25	11	2.5	2	1.6
26-35	185	42.0	48	38.4
36-45	186	42.3	57	45.6
46-55	39	8.9	12	9.6
56-65	8	1.8	3	2.4
66+	2	0.5	0	0.0
Missing	9	2.0	3	2.4
Gender				
Female	399	90.7	117	93.6
Male	36	8.2	6	4.8
Non-binary	3	0.7	0	0.0
Missing	2	0.5	2	1.6
Ethnicity				
Caucasian	357	81.1	93	74.4
Indigenous	10	2.3	1	0.8
Ethnically diverse populations	20	4.6	13	10.4
Missing	53	12.0	18	14.4
Age of children in the family[a]				
Infant (birth to 12 months)	53	12.0	14	11.2
Toddler (1-2 years)	88	20.0	31	24.8
Preschool (3-5 years)	246	55.9	84	67.2
School age (6-12 years)	391	88.9	103	82.4
Teen (13-18 years)	143	32.5	27	21.6
Adult dependent (19+ years)	6	1.4	4	3.2

Number of children in the family				
1	94	21.4	32	25.6
2	214	48.6	62	49.6
3	73	16.6	21	16.8
4	26	5.9	5	4.0
5+	13	3.0	4	3.2
Missing	20	4.5	1	0.8
Relationship to child(ren)				
Parent	429	97.5	121	96.8
Extended family care: grandparent, aunt, uncle, in-laws	11	2.5	4	3.2
Missing	0	0.0	0	0.0
Caregiving dynamics				
Living full time with partner and child(ren)	370	84.1	108	86.4
Shared custody with child(ren)'s other parent	18	4.1	5	4.0
Single parent caring for child(ren) full time	37	8.4	6	4.8
Working out custody arrangement	2	0.5	0	0.0
Caring for someone else's child(ren)	9	2.0	3	2.4
Full time parenting while partner works away from home	4	0.9	1	0.8
Missing	0	0.0	2	1.6

[a]Some families may be represented in more than one category due to multiple children in the household.

Participants in both surveys were asked to identify how Covid-19 and the subsequent public health measures had impacted the time that they were spending with their child(ren), and the time that their partner was spending with the child(ren), on a five-point scale from significantly increased to significantly decreased. There was no significant difference in participants' reports of their partners' time spent with the child(ren) between CPIS and CPSRS, X^2 (4, N = 526) = 8.88, p = .064. There was a significant difference in participants' reports of changes in their own time spent with their child(ren) between CPIS and CPSRS, X^2 (4, N = 565) = 16.17, p = .003, with participants in the CPSRS being more likely to report decreased or significantly decreased time with their child(ren) than participants in the CPIS. Participants were also asked to report whether they had attempted at-home schooling with their child(ren) during the final

months of the 2020 spring semester. Participants of the CPIS and CPSRS did not differ in their decisions to attempt at-home schooling, X^2 (2, N = 562) = 5.83, p = .054.

Health

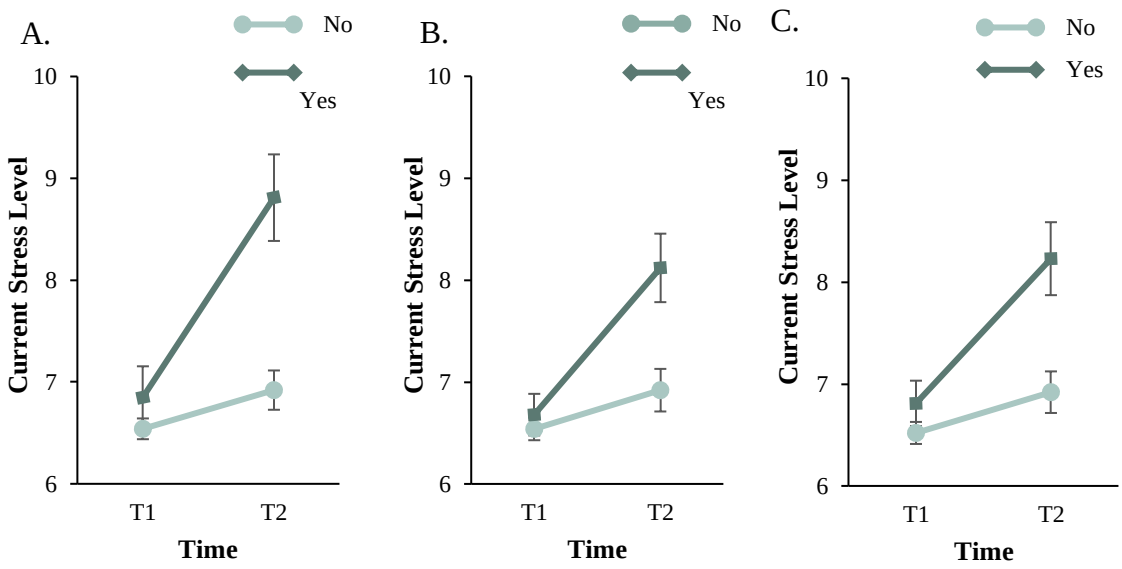
The percentage of participants who reported living in a household with someone who had a chronic illness did not differ between CPIS and CPSRS, X^2 (1, N = 564) = 1.90, p = .168. Nor did the percentage of participants living in a household with someone who was immunocompromised, X^2 (1, N = 564) = 1.91, p = .167. Participants of the CPSRS were slightly more likely to be living in a household with someone who had a significant disability than were participants of the CPIS, X^2 (1, N = 565) = 6.29, p = .012.

Univariate analyses were conducted for each of the household health vulnerability categories to determine if there was an interaction between household health vulnerability and time on current stress levels. For the significant disability group, the main effect of time was significant, F(1,523) = 17.11, p < .001, η^2 = .03, as was the main effect of living in a household with an individual with a significant disability, F(1, 523) = 15.18, p < .001, η^2 = .03. There was a significant interaction effect between time and household disability, F(1, 523) = 7.71, p = .006, η^2 = .02 (Figure 26). For the chronic illness group, the main effect of time was significant, F(1,522) = 15.67, p < .001, η^2 = .03, as was the main effect of living in a household with an individual with a chronic illness, F(1, 522) = 8.60, p = .004, η^2 = .02. There was also a small significant interaction effect between time and household chronic illness, F(1, 522) = 5.20, p = .023, η^2 = .01 (Figure 26). For the immunocompromised status group, the main effect of time was significant, F(1,522) = 14.63, p < .001, η^2 = .03, as was the main effect of living in a household with an individual who was immunocompromised, F(1, 522) = 11.09, p < .001, η^2 = .02. There

was also a small significant interaction effect between time and household chronic illness, $F(1, 522) = 4.49$, $p = .035$, $\eta^2 = .01$ (Figure 26). The presence of interaction effects for all three health vulnerability variables indicates that the impact of health vulnerabilities on stress levels is more significant at T_2 than at T_1.

Figure 26

Current Stress Level as a Function of Household Health Vulnerability and Time



Note: Figure 1A depicts current stress levels as a function of significant disability in the household and time between studies. Figure 1B depicts current stress levels as a function of chronic illness in the household and time between studies. Figure 1C depicts current stress levels as a function of immunocompromised status in the household and time between studies. Error bars represent standard error of the mean.

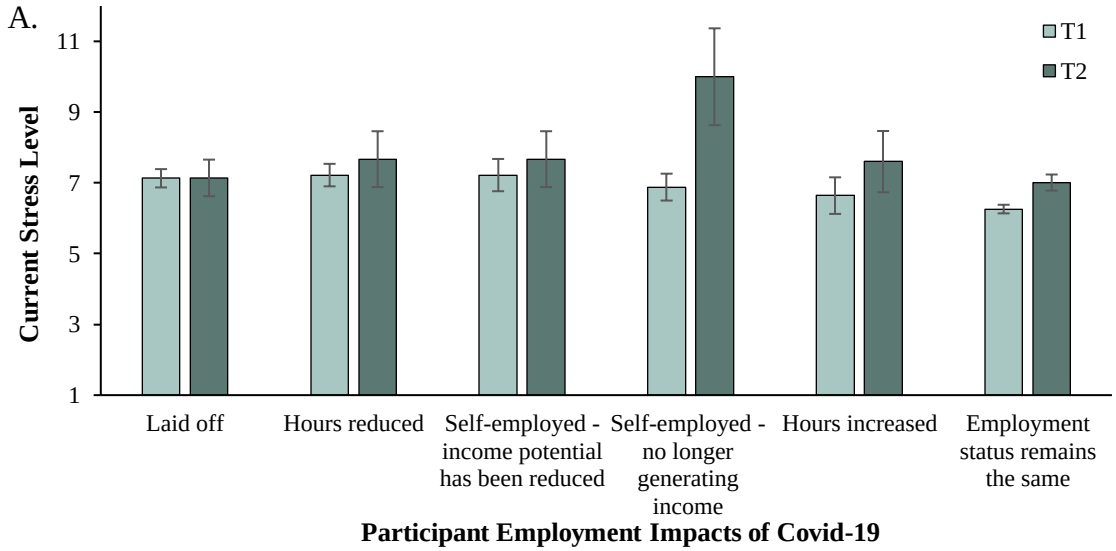
Employment

Participant reports of Covid-19 impacts on their employment status did not differ significantly between CPIS and CPSRS (X^2 (5, $N = 545$) = 5.15, $p = .398$) nor did reports of Covid-19 impacts on participants' partner's employment status (X^2 (5, $N = 490$) = 9.47, $p = .092$). Univariate analyses were conducted to determine if there was an

interaction effect on current stress levels between length of time in the pandemic and participant and partner employment impacts. For participants, there was a significant main effect of time, $F(1, 495) = 6.60$, $p = .010$, $\eta^2 = .01$ as well as a significant main effect of employment impact, $F(5, 495) = 2.54$, $p = .028$, $\eta^2 = .03$. However, there was no significant interaction between time and employment impacts, $F(5, 495) = 0.91$, $p = .474$, $\eta^2 = .01$. There was a significant main effect of partner employment impacts across the two studies, $F(5, 444) = 2.38$, $p = .038$, $\eta^2 = .03$, but no significant effect of time, $F(1, 444) = 1.74$, $p = .188$, $\eta^2 = .00$. There was also not a significant time by partner employment interaction effect, $F(54\ 444) = 0.57$, $p = .687$, $\eta^2 = .01$. See Figure 27 for current stress levels by participant employment impacts and partner employment impacts between the two studies.

Figure 27

Current Stress Level as a Function of Employment Impact and Time



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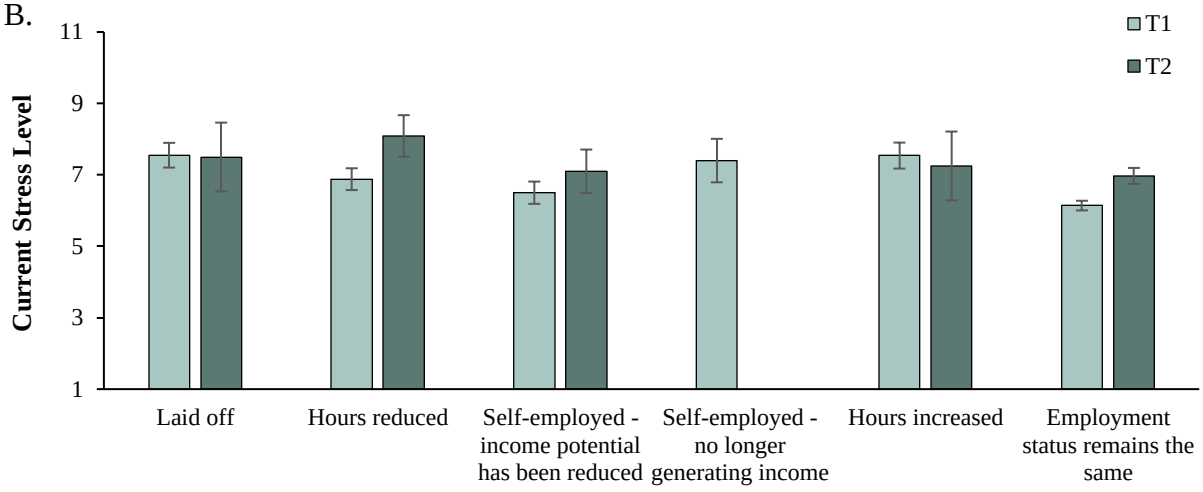


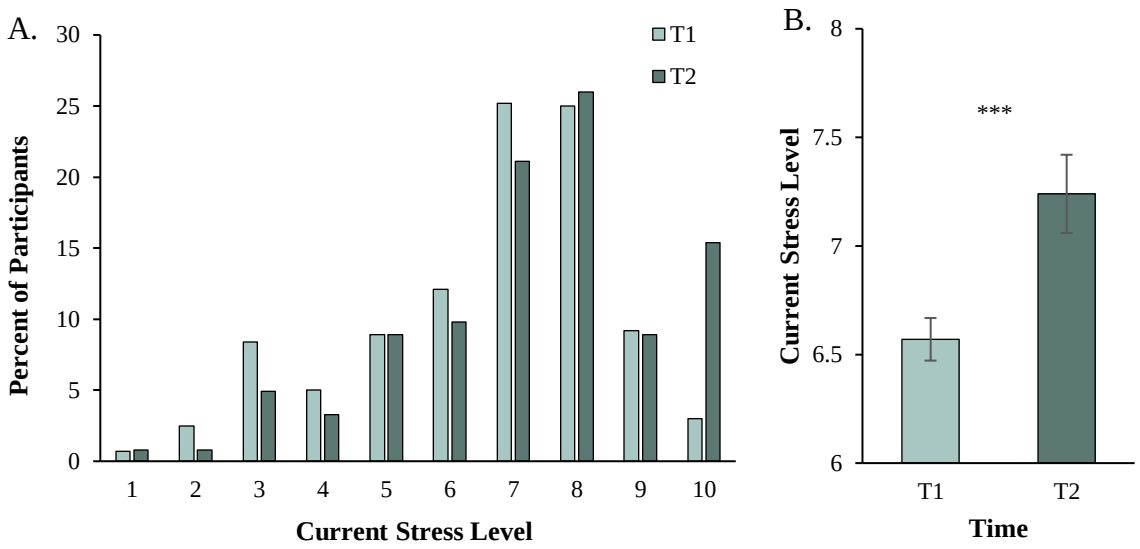
Note: Bar graph A: Participants' current stress levels as a function of their personal employment impacts across the two time periods of study. Bar graph B: Participants' current stress levels as a function of their partners' employment impacts across the two time periods of study. No participants in the CPSRS reported that their partner had been self-employed and was no longer generating income.

Stress Variables

An independent samples t-test was conducted to determine if there was a difference in parent stress levels between T_1 and T_2, with time (T_1 or T_2) as the independent variable and current stress level as the dependent variable. There was a significant effect of time on parents' current stress levels, $t(525) = -3.32$, $p < .001$, $d = -0.34$, with participants reporting higher levels of current stress at T_2 ($M = 7.2$, $SD = 2.0$) than at T_1 ($M = 6.6$, $SD = 2.0$) (Figure 28).

Figure 28

Current Stress Levels Between T_1 and T_2



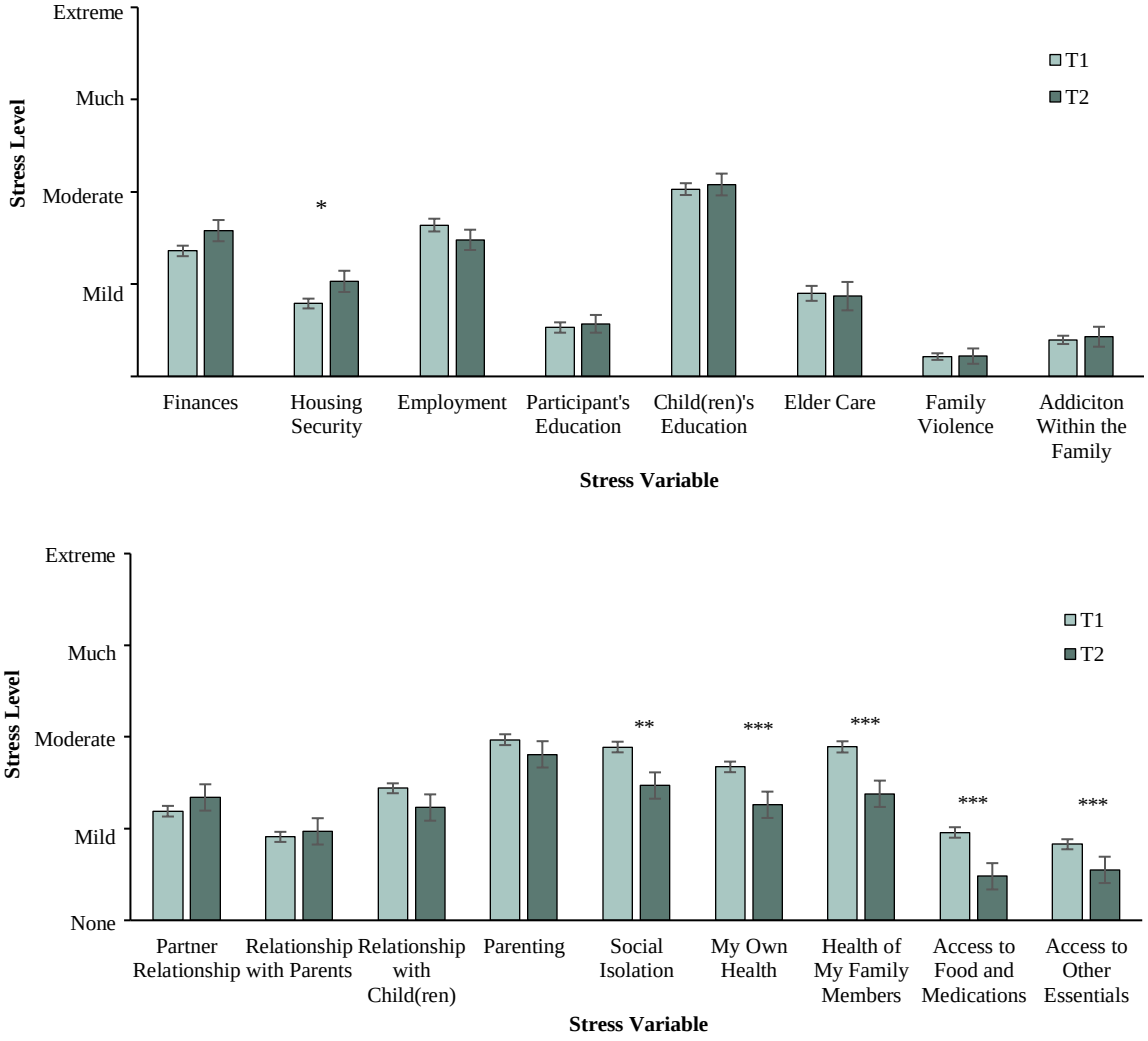
Note: Bar graph A: Distribution of participant reports of current stress levels between T_1 and T_2. Bar graph B: Average current stress levels reported between T_1 and T_2. ***$p < .001$.

Stress variables were compared using independent samples t-tests to determine if parents' reported stress associated with each variable was increasing, decreasing, or remaining stable over time during the Covid-19 pandemic. The independent variable was time (T_1 or T_2) with each stress-related variable analyzed as a separate outcome measure. Only one variable, housing security, showed a small significant increase in the amount of stress parents were reporting from T_1 (M = 1.8, SD = 1.1) to T_2 (M = 2.0, SD = 1.2), $t(520) = -1.98$, $p = .048$, $d = 0.21$. Parents reported significantly less stress associated with social isolation at T_2 (M = 2.5, SD = 1.2) compared to T_1 (M = 2.9, SD = 1.2) to, $t(531) = 3.34$, $p = .001$, $d = 0.35$. There was also a significant decrease in the stress parents associated with all four health related variables: my own health, $t(199.851) = 3.61$, $p < .001$, $d = 0.41$; the health of my family members, $t(188.412) = 4.00$, $p < .001$, d

= 0.47; access to food and medications, $t(189.486) = 4.55$, $p < .001$, $d = 0.55$; and access to other essentials, $t(167.317) = 2.59$, $p = .010$, $d = 0.32$. Full comparisons for all stress related variables from T_1 to T_2 can be found in Figure 29.

Figure 29

Stress Variables from T_1 to T_2

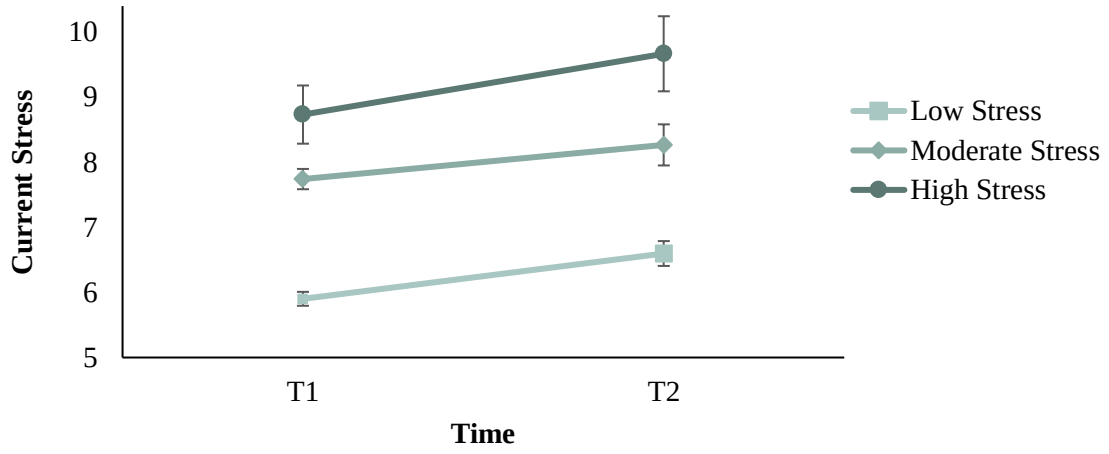


Note: Figure 5 depicts the change over time of stress associated with each stress related variable.
*$p < .05$. **$p < .01$. ***$p < .001$.

The percentages of participants in low, moderate, or high stress categories based on stress variables did not differ between the CPIS and CPSRS, X^2 (2, N = 562) = 5.66, p = .059. There was a significant main effect of stress category on current stress levels, F(2, 518) = 57.13, p < .001, η^2 = .18, and a significant main effect of time, F(1, 518) = 19.73, p = .011, η^2 = .01. The interaction of stress category by time, however, was insignificant, F(2, 518) = 0.16, p = .855, η^2 = .00 (Figure30).

Figure 30

Current Stress Level as a Function of Stress Category and Time



Note: Current stress levels as a function of stress category (based on responses to stress related variables) and time. Error bars represent standard error of the mean.

Resilience Variables

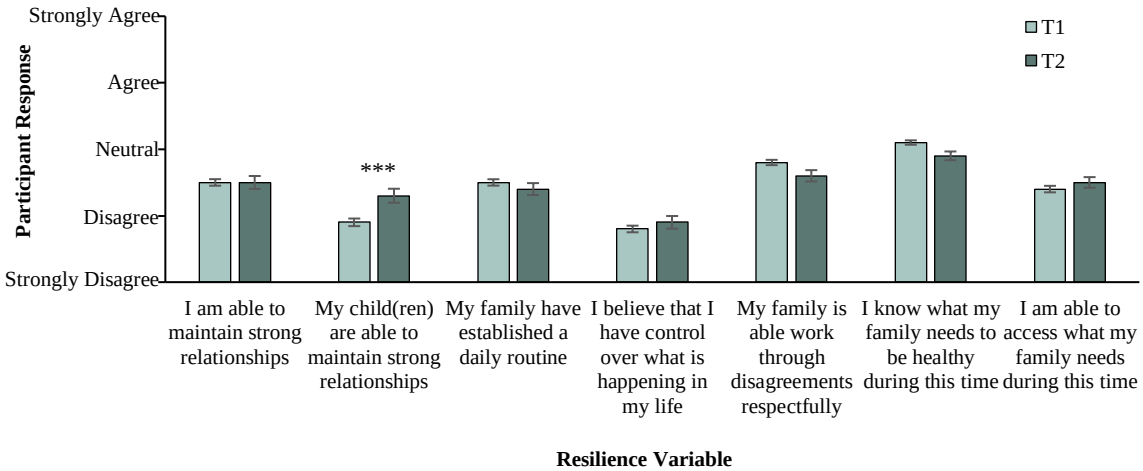
Distribution of participant responses to the question, "How has Covid-19 impacted the amount of time your family spends playing together?" did not differ significantly between CPIS and CPSRS, X^2 (4, N = 565) = 4.32, p = .365. There was a significant main effect of family time spent playing on current stress levels, F(4, 517) = 3.81, p = .005, η^2 = .03, and a significant main effect for time, F(1, 517) = 32.61, p =

.004, $\eta^2 = .02$. However, the interaction between time of survey (CPIS to CPSRS) and family time spent playing was insignificant, $F(4, 517) = 1.41$, $p = .231$, $\eta^2 = .01$.

Resilience variables were compared using independent samples t-tests to determine if parents' reports of each resilience variable were increasing, decreasing, or remaining stable over time during the Covid-19 pandemic. The independent variable was time (T_1 or T_2) with each resilience variable analyzed as a separate outcome measure. Only one variable, "my child(ren) are able to maintain strong relationships," showed a significant change from T_1 ($M = 1.9$, $SD = 1.2$) to T_2 ($M = 2.3$, $SD = 1.2$), $t(559) = 3.45$, $p < .001$, $d = 0.35$, indicating that participants believed that their children were better able to maintain strong relationships at T_2 than they were at T_1. No other resilience variables significant difference between T_1 to T_2. Full comparisons for all resilience variables from T_1 to T_2 can be found in Figure 31.

Figure 31

Resilience Variables from T_1 to T_2

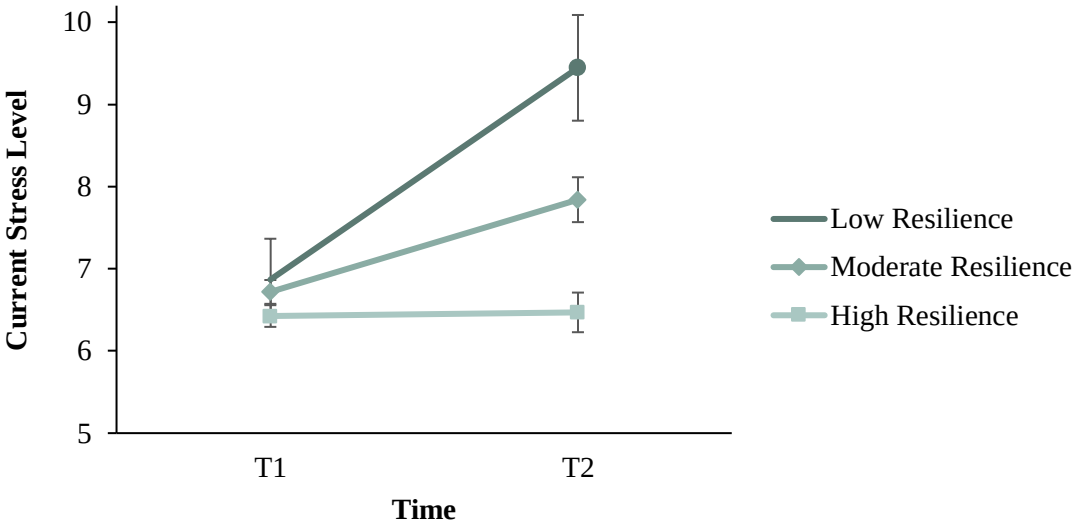


Note: Change in resilience variables over time. Error bars represent standard error of the mean.
*$p < .05$. **$p < .01$. ***$p < .001$.

The percentages of participants with low, moderate, or high resilience levels based on resilience variables did not differ between the CPIS and CPSRS, X^2 (2, N = 565) = 2.93, p = .232. There was a significant main effect of resilience category on current stress levels, F(2, 521) = 13.23, p < .001, η^2 = .05, and a significant main effect for time, F(1, 521) = 62.66, p < .001, η^2 = .03. The interaction of resilience category by time was also significant, F(2, 521) = 6.41, p = .002, η^2 = .02, indicating that the effect of the resilience category was stronger at T_2 than at T_1 (Figure 32).

Figure 32

Current Stress Level as a Function of Resilience Category and Time



Note: Current stress levels as a function of resilience category and time. Error bars represent standard error of the mean.

Discussion

The purpose of the CPSRS was to follow-up on data from the CPIS and provide additional measures of behavioural stress effects in the parenting population. Data from the CPSRS was analyzed independently and then compared to data from CPIS in order to examine time effects on parent experiences and stress during the Covid-19 pandemic. For purposes of clarity, when comparing the effect of time, CPIS may be referred to as T_1 and CPSRS as T_2.

Effects of the Covid-19 Pandemic on Parents' Stress

According to the APA (2019), Americans define a healthy level of stress as 3.8 out of 10. Within two months of the pandemic response, 88% of parents reported stress levels above that threshold and by five months into the pandemic response, 92% of parents were reporting unhealthy levels of stress as measured by the APA. Between T_1 and T_2, the average stress level of parents had increased by 10% from 6.6 out of 10 to 7.2 out of 10. At the time of the CPSRS, restrictions in the province of Alberta were lifting (OCMOH, 2020f; OCMOH, 2020g), which might have been expected to alleviate levels of stress. However, the data from this study indicates that the length of time spent under the adverse conditions of a global health crisis, along with the attendant social restrictions resulted in increased stress levels for parents over time.

The most significant stressors for parents remained relatively stable over time. Child(ren)'s education and parenting showed the highest levels of stress on individual stress variables at both time points, though child(ren)'s return to school surpassed them both at T_2 (variable was not included in CPIS). The amount of stress that parents reported connected to parenting and in association with their child(ren)'s education demonstrated

that, in addition to all of the stressors incumbent in the Covid-19 pandemic, parents have an additional layer of highly significant stressors weighing on them. This should be taken into account by governments, funders, and employers as they consider and decide upon policies and practices moving forward, especially if further lock-downs are to be implemented.

Stress associated with social isolation, personal and family health, and access to essential items decreased from T_1 to T_2. At T_2, social and community restrictions were starting to ease, allowing people to participate in social activities and to see their friends and families. Easing of restrictions at T_2 and adaptations to virtual social platforms are likely to account for much of the difference in stress associated with social isolation. Social isolation was still strongly correlated with current stress levels suggesting that those who were still feeling or experiencing acute social isolation were experiencing higher stress levels overall.

As restrictions eased, there was a sense for some that the acute threat of the virus was lessening. At T_1, symptoms of Covid-19 were still unclear, mortality rates were uncertain, and mode of transmission was still being confirmed. At T_2, testing and contact tracing measures were solidly in place and symptomology and mode of transmission were much clearer. These aspects potentially contributed to a decrease in the acute fear that some people were feeling for their own health and safety and that of their family members. The relationship between stress related to one's own health and current stress levels also decreased between T_1 and T_2, while the relationship between concerns about family members' health and current stress increased. The decrease in relationship between personal health and current stress is likely related to the reasons listed above,

most notably that early stages of the pandemic were characterized by catastrophizing of fears. The increase in relationship between concern for family members' health and current stress levels might be related to children's return to school. Almost 50% of participants reported that they were concerned about their child(ren)'s health and exposure to many people as they returned to school.

Age, Gender, and Ethnicity

Early on in the Covid-19 pandemic, men and women were reporting similar stress levels. As the pandemic progressed, a small gender effect appeared indicating that men were experiencing higher levels of stress at T_2 than were women. It needs to be noted that the sample size of men was very small in the CPSRS which may account for the gender differences. However, it is also possible that the prolonged conditions of the Covid-19 pandemic response are affecting men and women differently. There are several possible explanations for the effects seen here including differing physiology, differences in social networks and social supports, and differences in societal expectations and cultural norms resulting in differing cognitive appraisal of specific stressors.

Traditional gender roles have women responsible for child rearing, care for the elderly, and maintenance of the home environment and men responsible for provision of physical requirements such as food, finances, and safety. Though these roles are shifting in modern society, Covid-19 has magnified the gender role gap in numerous areas (Fischer & Ryan, 2021; United Nations Secretary General, 2020). On individual measures of stress, male respondents in the CPSRS reported higher levels of stress associated with finances, employment, and housing security which suggests a possible effect of cognitive appraisal for these stressors that differs between men and women in

the population included in this study. Finances, employment, and housing security are all measures of financial security which fall under traditional male gender roles and expectations. Men also reported higher levels of stress associated with social isolation. It is possible that societal conditioning has impacted the ways in which men and women seek and perceive social support during social isolation measures. Future studies might consider the role of cognitive appraisal on the impact of stressors during the Covid-19 pandemic.

Ethnicity does not appear to be significantly related to either stress levels or feelings of loneliness among parents during the Covid-19 pandemic suggesting that the stressors incumbent in the Covid-19 pandemic response are producing impacts that cross cultural and ethnic lines. However, the populations in both the CPIS and CPSRS were primarily Caucasian, so some effects may have been missed. Although there was not a statistically significant difference between Caucasian and ethnically diverse populations on measures of stress or loneliness, there were large effect sizes on both measures at T_2 indicating that Caucasian participants were both more stressed and more lonely than ethnically diverse participants. There are several biopsychosocial differences between various ethnic groups including social and cultural norms, and it is possible that there are some protective factors present in ethnically diverse populations and communities that merit exploration. It would be beneficial to examine the impacts of and responses to the Covid-19 pandemic among various ethnic communities in order to assess both risk and protective factors.

In the first survey, older parents reported somewhat lower levels of stress than younger parents suggesting a protective effect of parenting and life experience. However,

this difference disappeared over time. The aging process affects all systems of the body, including the stress response system. Younger parents have an advantage physiologically and it seems likely that as the pandemic wore on, the protective effect of experience and the protective effect of physiological stamina may have balanced one another out. In the continuing months of the pandemic, it bears investigating whether younger parents may have a physiological protection against the compounding and chronic stressors of the pandemic.

Finances and Employment

Financial and employment stressors showed significant relationships with current stress levels at both T_1 and T_2. According to Statistics Canada (2021), there was a direct relationship between wage and employment loss during the Covid-19 pandemic, with the lowest wage earners experiencing the highest percentages of layoffs and the highest wage earners experiencing the lowest percentages of layoffs. In the CPSRS there was a significant relationship between household monthly net income and current stress levels with participants in the highest earning households reporting significantly less stress than those in the lowest earning households. Household net income had an even stronger impact on participants' financial stress. Between the lowest income category ($2000 or less) and the second lowest income category ($2001-$4000), participants average financial stress dropped from much/extreme stress to mild/moderate stress. This trend continued downward as household income increased.

CERB had a significant impact on Canadians' financial security and disposable income with Canadians in the bottom income quintile reporting an increase of disposable income of 33% from the first to second quarter of 2020 (Statistics Canada, 2021). One in

five participants in the CPSRS reported that either they or their partner was receiving CERB benefits and there was no difference in stress levels between those whose household income included CERB and those whose did not. The difference in both current stress and financial stress lay in overall household income, not in source of income, indicating that for those participants who had lost employment but were able to access CERB, the government financial support had a significant effect on buffering both financial and cumulative stress levels. This is crucial in considering not only the ongoing circumstances of the pandemic, but the future of Canadian financial support services. Chronic stress is a major contributor to lifelong disease often resulting in employment disruptions, and subsequently has significant economic impacts on both the workforce and the medical care system (Anda et al., 2006; Charmandari et al., 2005; Felitti et al., 1998; Liu et al., 2013; Mæhlisen et al., 2018). If preventative measures, such as CERB, can buffer stress levels as shown in this study, then financial support measures have the potential to create significant impacts on health and well-being of individuals, which directly impacts the economies in which they work and access health care. Several participants in both the CPIS and CPSRS named finances and employment loss as major sources of stress in their lives and relationships, and more than one participant called directly for income supports saying; “Canadians need a basic living income just to survive during this pandemic.”

Stress associated with accessing food, medications, and other essential items decreased from T_1 to T_2. However, the strength of the relationship between access to other essentials and current stress levels increased over time. Financial strain may be a mediating factor between these variables as strain on financial resources directly impacts

the stress associated with being able to access (afford) things such as diapers, formula, or medical equipment.

The only stressor that significantly increased over time in this study was stress related to housing security. During the CPIS, some parents indicated that their responses to the survey questions would "depend on how much longer [the pandemic] lasts. We can do another month or so financially, socially and emotionally but longer than that will have dire consequences to us and our economy." Participants at T_1 reported higher levels of financial stress than stress related to housing security. The impacts of financial strain compound over time as savings deplete. It seems likely that individuals who experienced loss of employment and financial stress early on in the pandemic may have started to worry about the logistics of housing security more significantly as time went on. This may explain why financial stress did not seem to increase over time but housing security stress did. For those individuals who were not experiencing financial strain, or were able to access CERB, their financial stress decreased or stayed the same, while for those individuals who were stressed financially, this stress compounded over time affecting other areas of their lives such as concerns about housing security and access to essentials. Additionally, though the overall level of financial stress that participants were reporting did not change significantly from T_1 to T_2, the correlation between financial stress and current stress levels did increase, indicating that financial stress was having a more significant effect on cumulative stress levels for those individuals who were experiencing financial stress.

It is important to note that at the time of the CPSRS, almost six months into the Covid-19 pandemic, over one in three participants reported that their employment had

been impacted by Covid-19 and over two thirds of those individuals had not yet returned to their pre-Covid-19 employment status. The effects of the Covid-19 pandemic continue to impact parent's employment and finances, and subsequently their levels of stress. The consequences of this financial, emotional, and physiological strain will likely continue to impact individuals and families for months and years to come.

Loneliness

Social isolation and loneliness have been shown to have significant effects on physical and mental health outcomes, including early mortality (Brinkley-Rubinstein et al., 2019; Heidari Gorji et al., 2019; Holt-Lunstad, et al., 2015; Loades et al., 2020; Nicholson, 2012). Loneliness, when viewed through a neurobiological lens, represents a loss or lack of attachment, which in humans is represents a major threat to survival. The connection between loneliness and mental health, disease, and early death lies in the activation of stress response networks and an insufficiency of protective relationships. Relationships are necessary to human survival. Relationships coregulate the nervous system; increase levels of essential hormones such as oxytocin, dopamine, and serotonin; and counteract the negative effects of adversity both during at after stressful or traumatic events. In the CPSRS, participants reported high levels of loneliness, with two out of three reporting their feelings of loneliness at a five out of ten or higher. Loneliness was highly correlated with current stress levels, as well as with the stress of social isolation and grief. Participants who reported that they were able to maintain strong relationships with the important people in their lives reported lower levels of loneliness. Interestingly, participants who reported being able to calm themselves down when they were fearful or worried also reported lower levels of loneliness. This may indicate that those

experiencing higher levels of loneliness are finding it harder to calm themselves down without the power of safe, supportive relationships. Neither age nor gender appeared to influence participants' feelings of loneliness.

Health

Health Vulnerabilities. There was a significant increase in the relationship between living in a household with someone living with a health vulnerability (chronic illness, significant disability, immunocompromised) and current stress levels between T_1 and T_2. At T_1, none of the health vulnerabilities were associated with increased levels of current stress, while at T_2, living with an individual with any of the three health vulnerabilities contributed significantly to higher levels of current stress. The most likely explanation for the increase in stress associated with health vulnerabilities over time is a depletion of resilience resources and physiological stamina for parents who were living with, or caring for, individuals with a health vulnerability.

Early on in the pandemic, when the isolation measures were believed to be short-lived, participants reported that they were "mostly just [putting] one foot in front of the other" and "just surviving," and many parents at both time points spoke about the challenges of not having respite or support services for children with behavioural or developmental challenges. Even prior to Covid-19, parents of children with disabilities reported higher levels of parenting stress than did parents of typically developing children (for a review see Craig et al., 2016) and the conditions of isolation, loss of supports, and additional, non-health related stressors likely exacerbated these conditions for many parents. While at T_1 parents may have had the psychological and physiological reserves to keep their stress levels manageable while living in survival mode, an additional three

months in the pandemic may well have depleted their resilience resources and energy reserves. At T_1 there was also still a sense of hope that the conditions of the pandemic would be short-lived, while at T_2 there was an updated understanding that the Covid-19 pandemic was going to be around for a much longer time than originally anticipated.

Some of the individuals represented in the health vulnerabilities were children, and some of them were parents, partners, or other family members. Many chronic illnesses in adulthood involve dysregulation of the stress response system (Charmandari et al., 2005; Ehlert et al., 2001). Individuals living with chronic illnesses prior to the pandemic may have faced bidirectional challenges during the pandemic in that their stress response systems may have already been dysregulated and therefore more sensitive to the stresses of the Covid-19 pandemic, and the increased stress of the Covid-19 pandemic may have exacerbated the severity of their symptoms. For those individuals who are immunocompromised, or living with someone who is immunocompromised, the very nature of a pandemic represents a real and significant threat to life.

As things began to open up, families living with health vulnerabilities have become more disproportionately impacted by the circumstances of the pandemic. If the health vulnerability put the individual at higher risk of contracting Covid-19, or at higher risk of severe complications from Covid-19, it is likely that families were being extra cautious and may have experienced greater stress associated with heightened social interactions. One parent living with a household member with a health vulnerability reported, “We managed to get through each day, but I felt like it was surviving not thriving. … With return to school, there are significant risks for our family.”

Medical Treatments. More than one in five participants in the CPSRS reported that they, or someone in their household, had significant health treatments postponed due to Covid-19. Experiencing postponement of significant health treatments was related to increased reports of current stress levels. Prior to Covid-19, the APA (2019) found that Americans, particularly younger Americans, experienced significant stress in relation to concerns about being able to access necessary health care. Significant health treatments likely affect longevity and/or quality of life. Having this type of treatment postponed represents an active risk to well-being and quality of life and it is not surprising that the postponement of these treatments is causing individuals and families increased stress.

Counselling and Mental Health. Participants in the CPIS reported that loss of access to counselling and mental health supports was a significant source of stress and worry. In the CPSRS, two thirds of participants who had been accessing counselling for themselves or a family member reported losing access to that service during lockdown measures. Only one third of those who lost counselling had re-accessed the service at the time of the CPSRS. Participants reported that they had not re-accessed due to financial constraints, loss of services due to funding cuts or lack of professionals, and/or that services offered online where not a fit for their circumstances. Continuing access to mental health services is crucial in times of heightened stress and uncertainty, and the disruption in counselling and mental health services during the public health measures of the Covid-19 pandemic is significant.

Mental health concerns, substance use, and drug related/overdose deaths have all increased substantially since the beginning of the Covid-19 pandemic (CDC, 2020; Friesen et al., 2021; Mental Health Commission of Canada, et al., 2021; Panchal et al.,

2021). Appropriate mental health services can prevent mental health challenges from escalating to the point of needing emergency medical care and/or hospitalization. In pursuit of protecting essential medical services during a pandemic, appropriate, timely access to community mental health services is crucial. Especially for children and youth, ability to access timely, appropriate mental health services is essential in promoting and protecting healthy development and neurobiology. The introduction and exacerbation of mental health concerns during previous epidemic and quarantine responses should have been taken into account when addressing which services were considered essential during initial lockdown phases (Brooks et al., 2020; Gostin et al., 2003; Hawryluck et al., 2004; Jalloh et al., 2018). The consequences of the mass quarantines, social isolation, major stressors, and uncertainties of the Covid-19 pandemic are having, and will continue to have, significant effects on people's mental health.

Grief

Only a small number of participants in the CPSRS reported that they had experienced the death of someone close to them during the Covid-19 pandemic. However, those who had experienced a close personal loss reported higher levels of stress than those who did not. Neurobiologically speaking, loss is experienced as a threat and triggers neurobiological stress responses (Bonanno & Kaltman, 2001). Loss of a loved one also disrupts attachment systems in the brain including oxytocin pathways and CRH systems (Demarchi et al., 2021). One participant succinctly explained the experience of losing a loved one during the Covid-19 pandemic; "The adjustment of a death is difficult in normal circumstances, but with the needs of the kids it becomes significantly more

difficult and unique. Because of Covid, no one was, and still are not, available to really substantially help us work through it with the kids."

Though grief is most commonly thought of in terms of loss of a loved one, humans experience attachment to places, possessions, jobs, and even to future hopes, dreams, and plans. During the Covid-19 pandemic, people lost many things that were important to them; some tangible, such as loved ones or jobs, and some conceptual, such as future plans, predictability, and a sense of community. Loss of, or absence of, relationships was a ubiquitous experience during the Covid-19 pandemic and "because humans are inescapably social beings, the worst catastrophes that can befall us inevitably involve relational loss" (Perry & Szalavitz, 2006, p. 346). The losses experienced during the Covid-19 pandemic were many, and they were set against a backdrop of disrupted and fragmented social connection. One participant in the CPIS reported, "I feel like all the grief I'm feeling is unseen." It is likely that grief during Covid-19 was a more universal experience than it was unique.

Some studies and theories have posited that grief becomes more complicated the more it disrupts day-to-day life; impacts access to rewarding, meaningful activities and interactions; interrupts the sense of stability and continuity of life; and causes long-term changes in one's social environment (for an overview see Papa & Maitoza, 2013). These complicating aspects of grief were incumbent in the realities of the Covid-19 pandemic for those who experienced loss and those who did not. Grief is difficult and complicated under the most ideal circumstances. The Covid-19 pandemic not only produced multiple, often co-occurring losses, but also created conditions in which grief is often exacerbated and prolonged, potentially complicated the grief process.

Parenting

Family-dynamics, including parenting, participant-partner relationship, and participant-child relationship, showed significant relationships to current stress levels at both time points. The amount of stress participants reported experiencing in their relationship with both their partner and their child(ren) also highly impacted the amount of stress they associated with parenting. This provides further evidence for the need to promote strong, positive relationships between parenting partners and between parents and children. Parent-child relationship quality is one of the highest predictors of parenting stress (Esdaile & Greenwood, 2003; Magill-Evans & Harrison, 2001; Umberson, 1989) and marital relationships affect parenting stress levels, parenting behaviours, and overall levels of stress and life satisfaction (Krishnakumar & Buehler, 2000; Thomas et al., 2017). Stress associated with social isolation was also significantly related to parenting stress at both T_1 and T_2 and, as mentioned previously, social isolation and parenting stress likely have a bidirectional relationship.

At T_1 increased time spent with one's children due to social isolation was associated with higher levels of current stress; however, this effect disappeared at T_2. More parents at T_1 reported increased time spent with their children due to isolation than did parents at T_2. Between T_1 and T_2 daycares were allowed to reopen which allowed parents of young children and those who were trying to work from home a respite from trying to juggle both work and parenting. One parent at T_2 confirmed that some of her responses would have been different while daycares were still closed.

Similar to time spent with children, having older children and having more children in the household were both related to lower levels of stress at T_1 but not at T_2.

Again, reopening of daycares likely played a role in the disappearance of this effect, since parents of young children were able to access daycare again, but older children were still out of school. It is also possible that there is a habituation effect between T_1 and T_2 as parents of younger children developed a routine and became more accustomed to having them at home, thus leveling out the disparity in stress levels. In the other direction, it is possible that as the pandemic wore on, older children were more acutely feeling the loss of social relationships and activities and this was affecting their mental health and relationships within the family, subsequently impacting parental stress levels.

At T_2, stress related to family violence and addiction within the family did not show a relationship to current stress levels. However, these results should not be taken to indicate that family violence and addiction are not significant stressors during the Covid-19 pandemic. Rather they should only be interpreted as indicating that there was not a significant prevalence of family violence and addiction within this particular population. Quarantine measures have been shown to exacerbate the incidence and severity of intimate partner and family violence and rates of addiction and death by overdose (Friesen et al., 2021; John et al., 2020; Mental Health Commission of Canada et al., 2021; Panchal et al., 2021; Peterman et al., 2020; United Nations Secretary General, 2020). Family violence and addiction have profound consequences for both adults and children. As the prevalence of family violence and addiction in the population of this study was negligible, the data from this study should not be used to make any assumptions or generalizations about the impact of violence and addiction on other populations. Research is being done during the Covid-19 pandemic to address the prevalence and impact of

violence, substance use, and addiction on individuals and families and studies that address these issues directly should be consulted for this data.

Impossible Decisions

As parents prepared for a new school year against the backdrop of a global health crisis, many felt as though they were being asked to make impossible decisions about school, work, and parenting their kids. One such decision was regarding choosing the best schooling option for their child(ren) in the fall term. Parents in the CPSRS reported significant levels of stress around making this decision. In the CPIS, many parents expressed fear and concern about the impacts of Covid-19 and the public health restrictions on their children's social and emotional development. During the CPSRS, parents were faced with the opportunity to have their children return to school and other more typical social environments. However, parents were worried about exposing their children and families to Covid-19 and had to make hard decisions about what to prioritize. One participant summed up the impossible decision, "the biggest concern for me is the health of my children, and currently, it feels like I can either prioritize physical health, or mental health, not both."

Parents reported significant amounts of stress related to deciding whether or not their child(ren) would return to in-school learning in the fall of 2020, and parents who ultimately chose at-home learning reported the highest levels of stress associated with this decision. Less than 10% of parents in the CPSRS reported that they had no concerns regarding their child(ren)'s return to school. Compounding the stress of a decision that was weighted with questions about both physical and mental health and development, was the fact that, for many parents, this choice also had significant financial

consequences. One participant reported being, “worried about my personal income as a stay-at-home mom who chose to do school at home and support my children.” Another participant worried about the days that they would have to take off; “I’m incredibly anxious about what will happen when the cold/flu start spreading, and we constantly have children home who require … Covid testing before they can return.”

Parents’ stress about their child(ren)’s return to school was highly associated with their satisfaction around the communication they were receiving about the plans for school in the fall. Almost half of parents in the CPSRS said that they were satisfied with the communication about fall schooling, but for those who were unsatisfied, the stress around their child(ren)’s return to school was heightened. Some parents still did not know what the plan was for their child(ren) within days of the start of the fall semester.

Satisfaction with return to school plans was low, with only one in three parents reporting that they were satisfied with the plan in their school division. One participant voiced the disparity in her feelings around fall schooling, “I fear for [my child’s] lack of schooling but am not happy with the lack of funding for back to school, thus the anxiety there.” Feeling as though their needs and concerns were being heard was highly correlated to satisfaction with communication about fall school programming. It is possible that schools were receiving parents’ feedback, but that school districts, boards, and government officials were not communicating frequently or clearly enough to assuage parents’ anxieties. In light of how significant the stress around children’s return to school is, it is crucial that schools and governments plan well, communicate clearly and often, and take into account the complex, compounding experiences and stressors of parents during an already challenging time. It should be noted that, when asked who they

felt needed to hear their concerns, parents responded that administrative and government levels needed to be listening. Many parents were satisfied with, and grateful for, the support, effort, and dedication that their child(ren)'s teachers were putting in and felt that the challenges lay above the level of frontline teachers.

Compounding Stress and Uncertainty

Current stress levels increased from T_1 to T_2, despite stress associated with individual stress variables decreasing in some variables and staying relatively stable in most others. The most likely explanation for this occurrence is the cumulative effects of stress over time. Parents were already experiencing and reporting very high levels of stress and multiple stressful demands on their resources at T_1. One parent reported during the CPIS that, "navigating school at home with 2 different aged kids and having a toddler and preschooler around is absolutely putting me to the brink of my abilities on a regular basis. I feel like I am going to lose my cool multiple times per day, every day of the week." Between T_1 and T_2, daycares were reopened and some restrictions had eased, but parents were still facing employment loss or uncertainty, financial strains, and a summer of children out of school, but without access to many of the activities and community resources that would usually occupy children and teenagers during the summer months. All of these stressors and uncertainties were on top of the general anxieties about Covid-19 and uncertainties about what the future looked like in light of the pandemic. At T_2, parents were also facing uncertainties about the fall and having to make hard decisions about their children's schooling and their own employment.

Parents were experiencing pre-emptive stress about a future that felt entirely uncertain. With restrictions lifting, but modelling numbers suggesting a significant

second wave of the Covid-19 virus (Public Health Agency of Canada, 2020), parents were experiencing stress about decisions that they might have to make in the future, not only the ones they were being asked to make in the present. One parent, in thinking about her children's future reported; "My toddler, especially, really suffered … in April-May, and I don't want to put her through that again. If everything shuts down again, I would want to take a leave from work to properly parent her. That would cause considerable financial and emotional stress for my husband and me, and challenge our relationship."

Chronic stress arises when there is a significant stressor that does not dissipate, and it can also occur when there are multiple lesser stressors that overwhelm the individual's abilities to cope. The Covid-19 pandemic represents both of these realities and one parent summed up this phenomenon particularly well: "There are so many layers of anxieties and worries, and minor events (unrelated to Covid, like dealing with a sickness, or having flooding in the house or other house repairs) leave me feeling completely overwhelmed. My brain has not turned off since schools were cancelled, and that alone is so draining." The underlying stressor of a global health crisis did not dissipate between T_1 and T_2 and all of the daily stressors that parents experience were still present along with the added stressors of the public health measures. This type of cumulative stress exhausts individuals', families', communities', and societies' resilience resources over time and results in increased levels of perceived stress even when individual stressors become less prominent. Chronic stress also sensitizes the stress response system and leaves it on high alert so that, as the parent mentioned above, even small things can overwhelm the system and result in a full stress response.

Another concern that parents voiced during the CPSRS was around how society and culture were changing and shifting during the pandemic and what impacts that would have on their children long-term. Several parents during the CPIS had expressed concerns about how the social distancing requirements would impact their young children's social development long-term and whether there would be lasting social anxiety and fear of relationships or proximity to others. During the CPSRS, these fears seemed to expand as parents began to worry about changes in society that would affect the world in which their children were growing up. One parent confessed, "One of my stressors or fears that wasn't asked about is the impact of the way society is acting on my child's mental health. I am genuinely worried for a world he may have to live in that we are calling a "new normal". The existential questions about the long-term impacts of the pandemic on their children was weighing on parents as more than one parent worried that "the social impacts and the fear that is being spread will impact our children for generations."

Attachment Disruptions and Parenting

Two latent stress factors were identified in both the CPIS and CPSRS. The latent stress factors identified during the CPIS were caretaking stress and financial security stress and in the CPSRS were attachment disruptions and parenting. Some of the variables overlapped between caretaking stress and the latent factors in the CPSRS, while the financial security stressor was eliminated entirely. Though financial stressors were still highly impactful in the CPSRS, it seems likely that, for the reasons discussed above, the introduction of CERB and the reopening of businesses and services helped to lessen the underlying factor of financial security stress.

In the current study, attachment disruptions included caring for elderly relatives, relationship with one's parents, relationship with one's partner, and grief. These variables represent common challenges in adult life that have become much more complex and often more difficult under the circumstances of the Covid-19 pandemic. Any attachment disruptions, as well as generalized grief, can make other attachment relationships more challenging. It is unsurprising to see the combination of adult attachments clustered together in a stress factor during the Covid-19 pandemic. As mentioned above, grief often disrupts the neurobiology of attachment, meaning that any sort of loss where grief is experienced will have effects in various realms of a person's attachment relationships.

Typically, in a healthy relationship, partners will ebb and flow in their levels of stress differently, and when one partner is more stressed, the opposite partner is able to offer additional support. However, during the Covid-19 pandemic, with stressors abundant and stress levels high, more and more people are exhausting their own resources leaving them with little capacity to support others. During the CPIS survey, participants reported that they were at their limits mentally and physically, overwhelmed by competing demands, and living in survival mode. By the time of the CPSRS, parents had been living under these conditions for an additional two to three months.

It seems likely that as the stressors of the Covid-19 pandemic wore on and people exhausted their individual resilience resources and personal capacities, they were looking to their primary attachments (parents and partner) for more significant support. However, if these individuals (especially partners) were experiencing a similar level of emotional and physiological depletion, they may not have had extra resources to offer the person

seeking support. This may result in dissatisfaction with the attachment relationships and subsequently stress and even grief responses.

People need people, and through adverse conditions, as stress levels rise, people need one another more than ever for support, regulation, and the healing power of relationship. Positive relationships result in many positive neurobiological changes including down-regulation of the stress response system and increases in hormones such as oxytocin, dopamine, and serotonin. Throughout the ongoing pandemic response and afterward, it is crucial that systems, governments, and professionals consider ways in which they can both decrease active stressors for parents and increase opportunities for positive relational interactions within families. People need more opportunities to be with one another in positive environments, not focused on the immediate stressors, challenges, and complications of the pandemic. This need was also emphasized by parents in the CPIS as they mourned the loss publicly accessible places and resources for families and requested ideas for simple and accessible ways to increase play, laughter, and engagement for both parents and children. These types of opportunities have a positive cyclical effect by increasing well-being in both parents and children and increasing positive interactions between parents and children which helps to decrease parenting stress and stress in the parent-child relationship, which promotes more positive interactions between parents and children.

The parenting factor present in the CPSRS includes child(ren)'s education, child(ren)'s return to school, and relationship with child(ren). These variables have been discussed at length above. Having them clustered together provides further evidence that the quality of parent-child relationship is crucial in decreasing stress related to parenting

in multiple areas. It also suggests that, in whatever ways possible, systems that support and work with parents should aim to reduce the stressors that they are placing on parents as parent stress levels impact the quality of parent-child relationships.

Resilience

Participants reported a small decrease between T_1 and T_2 in the amount of time that their family spent playing together. This is likely due to changing restrictions such as the reopening of daycare centers and preschools as well as some parents returning to work. Despite this small change, family play time was still positively associated with lower levels of current stress. As discussed above, there are several positive neurobiological, relational, and developmental purposes for play (Nijhof et al., 2018; Yogman et al, 2018). Play is an important resilience resource and continuing to encourage, support, and facilitate play in families may help to buffer stressors, down-regulate stress responses, and encourage positive relationships for parents and children alike.

The only resilience variable that increased from T_1 to T_2 was children being able to maintain strong relationships with important people. All other resilience variables that were comparable from T_1 to T_2 stayed the relatively stable. However, there was a significant increase in the relationship between resilience variables and overall levels of stress. At T_1, not one resilience variable showed a significant relationship with current stress levels, while at T_2, only two of fifteen resilience variables did not correlate positively with current stress levels. This indicates a huge change in the impacts of parents' resilience resources between T_1 and T_2.

As mentioned above, current stress levels increased from T_1 to T_2. Though resilience variables showed a significantly stronger relationship to current stress levels, the effect was not strong enough to reduce levels of stress overall. When resilience variables were averaged and participants assigned to a category of low, moderate, or high resilience, the impacts of the resilience variables over time became clearer. Having a high level of resilience at T_2 seemed to have a protective effect with participants in the high resilience category at reporting similar levels at both T_1 and T_2. However, having a moderate or low resilience score was associated with significantly increased levels of stress at T_2 compared to at T_1. This indicates that over time, having a high resilience score moderated the impact of chronic and compounding stressors on current levels of perceived stress, while having a moderate or low resilience score did not afford the same benefits. At T_2 participants in moderate to low resilience categories reported, on average, current stress levels 1.2 and 1.5 times higher, respectively, than did participants in the high resilience category.

The effect of resilience resources seen over time in this study may indicate that high levels of resilience resources act to produce positive outcomes by protecting against the compounding effects of chronic adversity. This highlights the importance of helping individuals, families, and communities develop resilience resources that are specific to their unique circumstances especially during times of heightened or prolonged stress. This includes a responsibility on governments and societies to ensure conditions in which families have access to resources and basic needs. However, as the percent of participants reporting low, moderate, or high levels of resilience did not differ between T_1 and T_2, this indicates that building up protective resilience resources such as strong, positive

relationships; accessible, affordable, and effective community resources; and promoting healthy development throughout the lifespan may help to buffer the effects of significant and chronic stress when they do occur. This study indicates that though the effects of resilience may be masked early on in acute stress responses, the impacts of resilience resources appear over time.

Agency and Co-Regulation

Agency was identified as a latent resilience factor in both the CPIS and CPSRS. In the CPIS, this factor included "I believe that I have control over what is happening in my life", "I have goals that I believe I will be able to achieve during isolation," and "my family have established a daily routine." In the CPSRS, agency included, "My child(ren) are able to maintain strong relationships with the important people in their lives," "I am able to maintain strong relationships with the important people in my life," "I am finding ways to take care of myself as well as my family," "I am able to access what my family needs during this time," and "I believe that I have control over what is happening in my life."

As discussed above, agency can be defined as a sense of control over the present or an individual's belief in their ability to act upon their own circumstances to effect outcomes. All of the variables included in the agency factor indicate that the participant believes that they can act in a way that allows them to create or access the circumstances that they want or need. It is interesting to observe that maintaining relationships and finding ways to take care of oneself are connected to being able to meet the needs of one's family and experiencing a sense of control. At T_1 parents reported that they were less able to maintain relationships or access what their family needed than at T_2. Having a

greater sense of social connectedness seems to be related to both self-care and family needs, and both the presence and lack of ability to maintain strong relationships appears to affect many areas of the participants' lives. Being able to access social supports and provide for the needs of the family certainly affects one's feelings of control over their circumstances.

Many participants in the CPIS reported feeling like they could not find time for themselves, were unable to take care of themselves well, and were overwhelmed and exhausted. One participant in the CPIS specifically articulated the need to take care of herself; "when I am able to take care of myself first, I'm a better mom, employee, etc., and that's just not happening right now." The presence of the self-care variable in the agency resilience factor supports the connection between taking care of oneself, making sure one's own needs are met, and feeling a sense of control over one's circumstances. When we take care of ourselves, and ensure that our needs are met, this has a protective effect on the nervous system by creating a sense of safety and rest and which downregulates the stress response. This increases our cognitive ability to respond rather than react when we encounter other stressful stimuli or challenging situations. Finding time and developing ways to take care of oneself amidst the novel circumstances of the Covid-19 pandemic may contribute to a greater sense of control by decreasing active stress responses and increasing capacity for cognitive appraisal both of which contribute to a greater sense of control and a greater capacity to actively choose one's actions and responses. As parents engage with the Covid-19 pandemic, they are actively learning what they need, and becoming creative about getting their needs and the needs of their children met.

The second latent resilience factor in the CPIS was hope. All three of the variables in the hope factor from the CPIS were removed from the CPSRS due to the updated understanding that isolation and public health measures would be in place for a much longer period of time than initially forecast. The second resilience factor in the CPSRS, co-regulation, included, "I know how to comfort my child(ren) when they are upset," "when my child(ren) are fearful or worried, it is generally easy for me to calm them down," and "my family is able to work through disagreements respectfully." The variables in the co-regulation factor indicate a top-down control of one's own nervous system as well as confidence in one's ability to soothe or calm their children. It also represents a cognitive appraisal of safety in, and ability to manage, one's family and home environment. For a child experiencing significant adversity, such as the conditions of the Covid-19 pandemic and subsequent health responses, being in relationship with a regulated, attuned adult is the most powerful protective factor. The presence in the CPSRS of a co-regulation resilience factor is a positive indication that, amid high levels of reported stress, parents are still seeking to provide a safe and attentive foundation for their children.

Behavioural Manifestations of Stress

Chronic stress over time leads to changes in physiology and neurobiology that manifest in behaviours, thought processes, and somatic symptoms. As seen in both the CPIS and CPSRS, perceived stress levels among parents are high and parents' reports of their behavioural indicators of stress reflect this. There were significant increases in stress related thoughts and behaviours from pre- to post-Covid-19 both in individual participants and in the population as a whole. The most significant behavioural increases

since the onset of Covid-19 were seen in participants' worries about symptoms of Covid-19 and worries about getting sick, followed by worrying about social situations while with others and losing interest in previously enjoyed activities. Over 90% of parents reported at least one behavioural symptom of anxiety at the time of the CPSRS and over 75% reported an emotional symptom. The average number of behaviours reported by parents increased by 107% from pre-Covid-19 to the time of the CPSRS.

The stress that parents were experiencing, as well as the stresses incumbent in the Covid-19 pandemic in general, are impacting children. Though almost one in three children in this study were reported to be exhibiting none of the behaviours listed, two out of five children exhibited five or more behaviours. The most prevalent behaviours in children were expressions of loneliness, temper tantrums, and irritability, followed by worrying about social situations beforehand and worrying about getting sick.

Parents in this study reported significant increases in their own stress related behaviours and high prevalence of stress related behaviours in their children. The number of behaviours that parents were experiencing correlated significantly to the number of behaviours that their child(re) were experiencing, indicating a pattern of co-dysregulation and familial stress patterns. For both parents and children, the most predominant categories of behaviour were anxieties and emotional symptoms. The behavioural manifestations of stress seen in both parents and children in the CPSRS are a strong indication of the physiological impacts that the stress of the Covid-19 pandemic is having on individuals. The prevalence of behavioural symptoms of stress in this study indicate a significant physiological dysregulation in two generations of the population that has the potential to produce physical, mental, and relational impacts for years to come.

Recommendations

Several recommendations were made following the CPIS including implementing only the least restrictive/intrusive measures possible given the risks of the situation; providing interventions during and after quarantine that focus on improving the quality of relationship between parents and children; ensuring that basic needs of families are met including financial support benefits, medical coverage, access to mental health services; and additional accommodations for parents when schools and daycares are closed. The data from the CPSRS further support these recommendations.

The degree of stress that parents reported in connection with their child(ren)'s schooling for the fall of 2020 was significant. Parents expressed a lack of satisfaction with both the planning and the communication from school divisions and government professionals. Preparing for school required that parents to make several decisions including whether their children were going to be attending in-person learning, whether one or both parents would be decreasing their workload to care for kids at home, and how to navigate having child(ren) home from school if they were exposed to Covid-19 and had to be quarantined. These are not minor decisions and had implications for careers, finances, and partner relationships. Various schools and school districts were considering different options for the safety of their students and teachers including cohorts, staggered start and end times, alternating days for students, and a mixture of in-school and online learning. All of these options had different ramifications for parents' schedules and plans. Leaving parents until the week before the start of school with no concrete plan for what school was going to look like did not allow for parents to plan well and set their families up for success. In the future, school boards and school administrators should be aware of

the impact of their decisions on the families that they are serving. Beyond that, governments need to (a) be aware of the levels of stress facing parents during an emergency response; (b) provide support for school districts to make decisions based on the populations that they serve; and (c) provide the funding necessary to set up schools and families well to reduce as much additional stress as possible. If schools must be closed again in the future, governments should be prepared to support families through additional resources for childcare and/or funding for time away from work.

The significant increase in stress levels among those living in households with and individual with a health vulnerability highlights a portion of the population that needs special consideration during the ongoing pandemic response. “It’s important that all solutions include people with disabilities,” wrote one participant. Underlying health vulnerabilities, including disability and chronic illness, were only a small part of this study intended to be a disaggregating demographic variable. As such, it is beyond the scope of this study to offer recommendations regarding specific needs, resources, or policies to support individuals during the Covid-19 pandemic. This data serves only to highlight the disparity in stress levels during a prolonged pandemic response and emphasize the need for more research and attention to be paid to this population as they face unique challenges.

Having one’s basic needs met is a baseline for physical and emotional safety. During a pandemic, ensuring that individuals and families have their basic needs met should be a priority. The Canadian government introduced the CERB benefit within a month of the active pandemic response (Department of Finance Canada, 2020). This additional income support would appear, in this data, set to be a buffering factor against

financial stress which has been shown to be a significant contributor to stress levels overall. Out of this data, it is recommended that the CERB benefit be available until the Covid-19 pandemic is declared over, or at the very least until employment levels match or surpass those of pre-pandemic levels. It is not advised to pull the CERB benefit before there is significant evidence that there will be no future lockdowns, intrusive restrictions, or mass layoffs because removing the CERB benefit and then needing to reimplement it would be costly, cumbersome, and interrupt financial security for those who need it. Along with baseline financial support, provision of preventative and maintenance health care such as prescription medications (including psychiatric medications) and medical supplies can help protect the medical system by ensuring that the general population is able to maintain good health while the health care system focuses on addressing Covid-19. Provision of this level of medical care can help keep people out of emergency medical centres and hospitals.

Another recommendation that comes out of the cumulative data from the CPIS and CPSRS is the need for increased access to mental health services, and for continuity of care in mental health services to be considered a priority. During the lockdowns of the Covid-19 pandemic, many people who were accessing counselling were unable to do so. Additionally, individuals lost medical benefits jeopardizing their access to "non-essential" health services and prescriptions. In light of the impacts that the Covid-19 pandemic is having on individuals' behavioural, emotional, and psychological well-being, including addictions, as demonstrated clearly in the CPSRS data and other studies conducted during the same time (Friesen et al., 2021; John et al., 2020; Mental Health Commission of Canada et al., 2021; Panchal et al., 2021; Peterman et al., 2020), mental

health care can no longer afford to be considered “non-essential.” Chronic stress manifests medically in various conditions discussed at length in this study, and when the manifestation of stress is physical, it is under the umbrella of essential health care services provided under universal health care in Canada. However, counselling, addictions services, trauma support services, and psychiatric medications are not covered by universal health care, are prohibitively expensive, and require private health care to subsidize these costs. Economically, it is in the best interest of a society to provide health care at the earliest, most preventative, and least restrictive point possible. This means before depression escalates to suicide attempts, before stress-related mental health manifests as psychosis, and before anxiety escalates to panic attacks that feel like heart attacks and result in cardiac assessments. The closure of mental health services during lockdowns, and at any point during the Covid-19 pandemic is unethical and puts individuals and our health care system at risk. Moving forward in the pandemic, and during any future public health emergencies, mental health services must be considered essential to avoid onset of mental illness, intervene to prevent escalation of existing mental illness, and mental health professionals should be consulted to determine the safest, most effective, and most efficient interventions in light of the circumstances.

Limitations

Several of the limitations of the CPSRS are similar to the CPIS. The samples from both surveys were predominantly mothers with limited ethnic diversity, residing primarily in southern Alberta and thus reflect the timing and specifics of the public health measures, education systems, and health care systems specific to Alberta. Additionally,

neither survey has a pre-pandemic baseline measure with which to compare stressors and stress levels at either time point.

Participants at both times points were recruited through the same channels so there was likely overlap in participants between the CPIS and CPSRS. However, participation was anonymous and the sample sizes were different so direct conclusions about the change in stress in individuals cannot be made. Rather, the data from this study represents changes in the parenting population in general in Southern Alberta during the first six months of the Covid-19 pandemic.

In the stress behaviour data, the baseline, pre-pandemic behavioural responses from participants are subject to retroactive recall bias, while the current stress behaviours are subject to self-report biases. The child stress behaviours are also subject to participant bias both in general terms and in relation to stress or bias within the parent-child relationship at the time of the survey. For example, a parent who is feeling highly stressed may project their own worries onto their child and report more behaviours in their child than might be seen by an objective observer. The parent may also report more significant behaviours in a child whom they are struggling to parent or struggling in relationship with. These limitations exist in all parent-report surveys of children's behaviour and are generally considered as acceptable risks as the parent's perception of the child impacts the child's self-perception and behaviours, and the parent's perception of the child is the lens through which they parent and experience their child.

The other limitation in the stress behaviour data is that, though all questions were acquired from validated measures, many were reworded for a general population and several measures used exist within multiple diagnoses. This would be a limitation if this

data was seeking to diagnose; however, the intention of the stress behaviour data in this study was to illuminate patterns within the population and between parents and children.

Future Directions

Between T_1 and T_2, small differences appeared between male and female participants and between Caucasian and ethnically diverse populations on measures of current stress levels. Though these effects were small in this population and may be attributable to small sample sizes, future research would benefit from exploring the impacts of the Covid-19 pandemic on more diverse populations. Specifically, future research should examine cognitive appraisals of stressors, impacts of social isolation, and both individual and cultural risk and protective factors in sample populations that are more representative of men and non-binary individuals and in a sample that is more representative of indigenous individuals and other cultural groups.

The CPSRS included behavioural measures of stress for both participants and children and this data helped to support and clarify data collected throughout the rest of the study. Behavioural data is a good indicator of internal cognitive processes and physiological experiences. However, future research should seek to collect physiological data to broaden the scope of understanding of the impacts of the Covid-19 pandemic. Two data sets in particular would supplement the data collected in this study: physiological markers of stress in parents and their children, and physiological markers of stress collected from children over a longitudinal period. The first data set would supplement the behavioural data collected in the CPSRS and allow for examination of intergenerational transmission of stress through relationship. The second data set would

offer insights into the physiological resilience of children during the Covid-19 pandemic and allow for examination of epigenetic changes due to the Covid-19 pandemic.

As mentioned above, more research needs to be done on the unique experiences of families living with disabilities and/or chronic illnesses during the Covid-19 pandemic. Future research in this direction could assess risk and protective factors, examine continuity of supports and resources during the public health restrictions, and assess the unique interactions of disability and illness with general stressors and non-Covid-19 health outcomes during the Covid-19 pandemic. Finally, as financial security has been discussed in much depth throughout this study, future research could compare individual and family outcomes between countries that provided different levels, amounts, and lengths of income support during the pandemic.

Conclusion

The CPIS highlighted the unique and challenging situations that parents were experiencing during the early months of the Covid-19 pandemic. The CPSRS supplemented this data by providing additional information about the complex and competing stressors that were challenging parents. The CPSRS also included behavioural measures that highlighted the ways in which stress was manifesting for both parents and children. Finally, data from the CPIS and CPSRS were compared to provide a picture of the shifting dynamics in parenting stress levels over time during the Covid-19 pandemic.

The data from this study is clear: parents are experiencing significant levels of stress both in relation to individual stress measures and in current reports of cumulative stress. Stressors related to parenting their children and being in relationship with their family members were among those experienced as most stressful at both time points,

though parents also reported significant stress in relation to finances, social isolation, and employment. The situations that parents are navigating during the Covid-19 pandemic are complex and multifaceted and parents are feeling the pressure and stress of trying to navigate these times well.

This study demonstrated that addressing active stressors is a crucial aspect in decreasing stress levels for individuals and demonstrated the significance of strong resilience resources in circumstances of chronic adversity. Despite all of the hardships that parents faced in the first six months of the Covid-19 pandemic, they never stopped seeking to support and love their kids well. Many parents in this study expressed gratitude for the time they got to spend with their child(ren). “I loved the first few months while truly isolating with my son,” reported a participant of the CPSRS, while another said, “the extra time with my children has allowed me to slow down and enjoy them and be grateful for our lives.” Throughout everything, the love of parents for their children was clear. Amid all the stresses, all the uncertainty, and all the change, parents want what is best for their kids. One parent, after acknowledging all of the hardships that her family had faced over the previous six months stated, “I am crossing my fingers and hoping that my love and attention will make up for everything my children have sacrificed this year.”

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Appendix 1: Informed Consent Covid-19 Parent Isolation Survey

Please read the following information carefully before beginning the survey:

What is this study about?
This anonymous survey has been assembled by University of Lethbridge and Building Brains Together researchers in order to learn about the experiences of parents and families in the Lethbridge area as they respond to the ongoing realities of Covid-19, including the social restrictions and Public Health Measures. Your participation will contribute to understanding the impacts that Covid-19 is having on our community.

What is expected of you?
The survey contains six categories of questions and will take approximately ten to fifteen minutes to complete. The questions cover four main areas: stress, social, family, and resilience factors. There are basic demographic questions in order to allow for disaggregation of the data. **You may choose to skip any question you prefer not to answer.**

What are the anticipated uses of the data collected?
We are interested in understanding what is going on for families during the Covid-19 pandemic. We hope that the outcomes of this survey will help inform social supports and services in the Lethbridge area both for the remainder of the Covid-19 pandemic and in future emergency responses. Results will be shared with local support and service organizations where appropriate to support targeted and streamlined service delivery. The findings may also be published in scholarly presentations and publications.

What are the risks and benefits of participating?
There are no anticipated risks from participating in this study. You may gain some insight into your own family's experience during the Covid-19 pandemic. This data may be used to help professionals to better support parents and families throughout the next several months of this pandemic and to provide better service delivery in the future.

How will your confidentiality and anonymity be protected?
Participation is voluntary and your responses will not be identified with you personally as the survey collects no identifying information; however, as with any online survey, neither anonymity nor confidentiality can be completely guaranteed. The survey is being hosted on Google Forms and their privacy policy can be accessed at: https://gsuite.google.com/intl/en_ca/security/?secure-by-design_activeEl=data-centers.

The responses to this survey will be kept on a password-protected computer with restricted access, and will be deleted two years after data collection has been completed.

How can a participant withdraw?
Your participation is completely voluntary. You may withdraw your participation at any time without penalty by simply closing your browser before you submit your responses and they will not be included. If you choose to discontinue participation after you have submitted your responses, it will not be possible to withdraw your responses because they will not have any identifying information linked to them.

Who is conducting this research?
For more information on this study or for a summary of the findings, you may contact Dr. Robbin Gibb at gibb@uleth.ca or Dr. Claudia Gonzalez at Claudia.gonzalez@uleth.ca. Questions regarding your rights as a participant in this research may be addressed to the Office of Research Ethics, University of Lethbridge (Phone: 403-329-2747 or Email: research.services@uleth.ca).

This research study has been reviewed for ethical acceptability and approved by the **University of Lethbridge Human Participant Research Committee.**

You must be 18 years or older to participate in this survey.

If you wish to participate in the survey, please proceed to the questions now. Submission of your responses will be accepted as implied consent to participate.

Thank you in advance for your participation.

Appendix 2: Informed Consent Covid-19 Parent Stress and Resilience Survey

Please read the following information carefully before beginning the survey:

What is this survey about?
This anonymous survey has been assembled by University of Lethbridge and Building Brains Together researchers in order to learn about the experiences of parents and families in the Lethbridge area as they respond to the ongoing realities of Covid-19. This survey is a follow-up to the initial Covid-19 Isolation Parent Survey – some questions will be similar or the same in order to correlate responses between the two surveys. Your participation will contribute to understanding the evolving impacts that Covid-19 is having on our community.

What is expected of you?
The survey contains six categories of questions and will take approximately 15 to 20 minutes to complete. The questions cover five main areas: health, stress, children's schooling, employment, resilience factors. There are basic demographic questions in order to allow for disaggregation of the data. **You may choose to skip any question you prefer not to answer.**

What are the anticipated uses of the data collected?
We are interested in understanding the experiences of families during the Covid-19 pandemic. We hope that the outcomes of this survey will help inform social supports and services in the Lethbridge area both for the remainder of the Covid-19 pandemic and in future emergency responses. Stress and resilience are both individual and community experiences and understanding the interplay of stress and resilience factors within a community can help professionals, community members, and individuals respond to stress and develop resilience. Results will be shared with local support and service organizations where appropriate to support targeted and streamlined service delivery. The findings may also be published in scholarly presentations and publications.

What are the risks and benefits of participating?
There are no anticipated risks from participating in this survey. You may gain some insight into your own family's experience during the Covid-19 pandemic. This data may be used to help professionals to better support parents and families throughout the next several months of this pandemic and to provide better service delivery in the future.

Participants will be eligible to enter a draw for a $50 Superstore gift card. The odds of winning will be 1 in 50. If you would like to enter the draw, please email buildingbrainstogether@gmail.com with "survey draw" in the subject line. You will be providing your information for the draw via email in order to protect the confidentiality of the survey – there will be no way for researchers to connect your email to your survey responses.

How will your confidentiality and anonymity be protected?
Participation is voluntary and your responses will not be identified with your personal information as the survey collects no identifiers; however, as with any online survey, neither anonymity nor confidentiality can be completely guaranteed. The survey is being hosted on Google Forms and their privacy policy can be accessed at: https://gsuite.google.com/intl/en_ca/security/?secure-by-design_activeEl=data-centers.

The responses to this survey will be kept on a password-protected computer with restricted access, and will be deleted two years after data collection has been completed.

How can a participant withdraw?
Your participation is completely voluntary. You may withdraw your participation at any time without penalty by simply closing your browser before you submit your responses and they will not be collected. If you choose to discontinue participation after you have submitted your responses, it will not be possible to withdraw your responses because they will not have identifying information linked to them.

Who is conducting this research?
For more information on this survey or for a summary of the findings, you may contact Dr. Robbin Gibb at gibb@uleth.ca or Dr. Claudia Gonzalez at Claudia.gonzalez@uleth.ca. Questions regarding your rights as a participant in this research may be addressed to the Office of Research Ethics, University of Lethbridge (Phone: 403-329-2747 or Email: research.services@uleth.ca).

This research survey has been reviewed for ethical acceptability and approved by the **University of Lethbridge Human Participant Research Committee.**

You must be 18 years or older to participate in this survey.

If you wish to participate in the survey, please proceed to the questions now. Submission of your responses will be accepted as implied consent to participate. Thank you in advance for your participation.

Appendix 3: Covid-19 Parent Isolation Survey Recruitment Email

Email Subject Line: University of Lethbridge and Building Brains Together Study – Covid-19 Parent Isolation Survey

Dear _____,

My name is _____. I am writing on behalf of the Department of Neuroscience at the University of Lethbridge and Building Brains Together (BBT). Together we are studying the evolving impacts that the Covid-19 pandemic is having on families in the Lethbridge area.

We are inviting current and past participants in the BBT program to participate in a brief survey that would take 15-20 minutes to complete. Participation is anonymous and confidential. You will not be asked to provide any personal identifying information. The survey asks for a postal code in order to assess whether risk and protective factors are in any way linked to geographic areas. If you would rather not disclose this information, you may leave the answer blank. There are no anticipated risks to taking part in this survey and you can stop at any time and skip any questions that you wish.

If you have questions about the study or are interested in the findings, you may contact Building Brains Together at buildingbrainstogether@gmail.com. You may also contact the Office of Research Ethics at the University of Lethbridge at research.services@uleth.ca or 403-329-2747 if you have questions about your rights as a participant. This research has been reviewed for ethical acceptability and approved by the University of Lethbridge Human Participant Research Committee.

If you would be interested in completing the survey, please go to the following URL:

https://docs.google.com/forms/d/e/1FAIpQLSdh78Cg7HYlvOMWSKNEX37QSqufRhmsCD3odUfULAaHtpB76g/viewform

Thank you in advance for your participation.
[Name]
[Title]
[Phone]
[Email]

Appendix 4: Covid-19 Parent Isolation Survey Social Media Call Out

How has isolation impacted you and your family?

Building Brains Together along with researchers from the University of Lethbridge invite you to share your experience as a parent during the Covid-19 pandemic. All responses are anonymous and confidential and will be used to help professionals understand the impacts that Covid-19 and the subsequent Public Health Measures are having on parents and families.

Data from this survey will be used to inform social supports and services both for the remainder of the Covid-19 pandemic and in future emergency responses. Send us an email once you've completed the survey and we'll enter you into our draw for a $50 Superstore gift card. Draws will take place at the end of each month.

This research has been reviewed for ethical acceptability and approved by the University of Lethbridge Human Participant Research Committee.

If you would like to participate, please follow the link below:

https://docs.google.com/forms/d/e/1FAIpQLSdh78Cg7HYlvOMWSKNEX37QSqufRhmsCD3odUfULAaHtpB76g/viewform

Thank you in advance for your participation!

Appendix 5: Covid-19 Parent Isolation Survey

Household

In the household in which you live, which best describes you?
Parent
Step Parent
Foster Parent
Child
Grandparent
Cousin
Roommate
I am living alone
Friend
Aunt/Uncle
Other:

Please choose which best describes your housing situation:
Mortgage
Renting
Staying with relatives or friends
Not currently housed

Please describe which best describes your housing situation:
Apartment
Detached house
Town House
Basement Suite
Not currently housed
Other:

Do you have access to a yard?
Yes No

Is there anyone in your household with significant disability?
Yes No

Is there anyone in your household with a chronic illness?
Yes No

Is there anyone in your household who is currently immunocompromised?
Yes No

Employment/Finances

Were you employed prior to March 16, 2020?
Full-Time
Part-Time
Contract
Self-Employed
Student
Laid off in the three months prior to March 16
Not employed

Has your employment and/or income been impacted due to Covid-19?
I was laid off
My hours were reduced
I was self-employed and my income potential has been reduced
I was self-employed and am no longer generating income
My employment status remains the same
My hours have increased

Do you anticipate Covid-19 to further impact your employment?
Yes
No
Unsure
N/A

If married/common law, has your partner's employment been impacted due to Covid-19?
Not applicable
My partner was laid off
My partners' hours were reduced
My partner is self-employed and their income potential has been reduced
My partner is self-employed and they are no longer generating income
My partners' employment status remains the same
My partner's hours have increased

Stress

Please rate your current stress level:

1	2	3	4	5	6	7	8	9	10
Not at all stressed									Extremely stressed

How has Covid-19 impacted your daily stress?
Significantly increased
Somewhat increased
No change
Somewhat decreased
Significantly decreased

How much are each of the following adding to your stress during this time of isolation?

Finances
No stress Mild stress Moderate stress Much stress Extreme stress

Rent/Mortgage/Housing security
No stress Mild stress Moderate stress Much stress Extreme stress

Education for myself
No stress Mild stress Moderate stress Much stress Extreme stress

Education for my child(ren)
No stress Mild stress Moderate stress Much stress Extreme stress

Relationship with my partner
No stress Mild stress Moderate stress Much stress Extreme stress

Relationship with my parents
No stress Mild stress Moderate stress Much stress Extreme stress

Relationship with my children
No stress Mild stress Moderate stress Much stress Extreme stress

Social isolation
No stress Mild stress Moderate stress Much stress Extreme stress

Employment
No stress Mild stress Moderate stress Much stress Extreme stress

Parenting
No stress Mild stress Moderate stress Much stress Extreme stress

Caring for elderly relatives
No stress Mild stress Moderate stress Much stress Extreme stress

Social

How has isolation impacted the amount of time you spend socializing with people who do not live in your home?
Significantly increased
Somewhat increased
No change
Somewhat decreased
Significantly decreased

How had isolation impacted the WAY that you socialize with others?
No change
Primarily online
Primarily by phone
Combination of phone and online
Socialize primarily with the people who live in my house
Decreased socialization entirely

How has isolation impacted the amount of time you spend with your partner?
N/A
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Please check any of the following family support services that you were accessing regularly and that you have lost access to due to isolation:
Formal childcare (Preschool, Day Home, Childcare Centre, etc.)
Informal childcare (Babysitter, relative, friend, etc.)
In home support services
House keeping/cleaning services
Respite services
Family counselling
Children's counselling
Kids activities
Family support groups
Family to family socializing
Other:

Please check any of the following mental health services that you were accessing regularly and that you have lost access to due to isolation:
Support groups
Access to medication
Individual counselling
Group counselling
Other:

Please check any of the following physical health resources that you were accessing regularly and that you have lost access to due to isolation:
Dental
Massage
Chiropractor
Acupuncture
Gym access
Sports
Access to parks
Kids play places
Dance classes
Swimming pool
Other:

Of the supports and services you identified above, which losses have most significantly impacted your family?

<u>Family Impacts</u>

Are you currently caring for children?
Yes No

If yes, what age of children are you currently caring for?

Please describe your current parenting situation:
Living full time with partner and child(ren)
Shared custody with child(ren)'s other parent
Caring for someone else's child(ren)
Single parent caring for child(ren) full time
Working out custody arrangement
Foster parent
Other:

For the next questions, please answer in regards to the children you are caring regardless of relationship to them.

How has isolation impacted the amount of time you spend with your children?
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

How has isolation impacted the amount of time your partner spends with your children?
N/A
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

How has isolation impacted your daily physical activity?
Significantly increased
Somewhat increased
No change
Somewhat decreased
Significantly decreased

How has isolation impacted your children's daily physical activity?
Significantly increased
Somewhat increased
No change
Somewhat decreased
Significantly decreased

How has isolation impacted the amount of time your family spends playing together?
Significantly increased
Somewhat increased
No change
Somewhat decreased
Significantly decreased

Are you currently attempting to home school your children?
N/A
No
Yes

How worried are you about the following during this time of isolation?

Family violence
Very worried Somewhat worried A little worried Not worried at all

Addiction within the family
Very worried Somewhat worried A little worried Not worried at all

My own health
Very worried Somewhat worried A little worried Not worried at all

Health of my family members
Very worried Somewhat worried A little worried Not worried at all

Access to food/medications
Very worried Somewhat worried A little worried Not worried at all

Access to other essential items (ie: diapers, formula, medical supplies, etc.)
Very worried Somewhat worried A little worried Not worried at all

My ability to care for my child(ren)
Very worried Somewhat worried A little worried Not worried at all

Resilience Factors

I am able to maintain strong relationships with the important people in my life during isolation
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My child(ren) are able to maintain strong relationships with the important people in their lives during isolation
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My family have established a daily routine
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I believe that I have control over what is happening in my life
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My family are having positive experiences together during isolation
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I have goals that I believe I will be able to achieve during isolation
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My family is able work through disagreements respectfully
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I believe that my family will be okay throughout isolation
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I believe that my family will be able to get back to normal once isolation is over
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I know what I need to be healthy during this time
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I know what my family needs to be healthy during this time
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I am able to access what my family needs during this time
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Please check which of the following resources you and your family would benefit from at this time:

Food assistance
Assistance with government forms
Play activities for kids
Play activities for adults
Educational activities for kids
Educational activities for adults
Mental health support for my child(ren)
Physical activities for kids that can be done in small spaces
Games that can be played in small spaces
Mental health support for myself
Mental health support for other adults in my home
Resources for creating a routine
How to support kids who are doing school at home
Information on child development
Addictions resources
Access to family violence support

Please list three things that have been particularly challenging during isolation for you and your family.

Please list three things that have been particularly rewarding or successful during isolation for you and your family.

If there anything else that you would like us to know about the impact of Covid-19 and isolation of you and/or your family?

What platform do you most often access online for resources and/or information?
Facebook
Instagram
Google
Email
Pinterest
Other:

Demographics

Age (in years):

Gender:
Female
Male
Non-binary
Two-spirit
Other:

Postal Code:

Ethnicity:

If employed, current occupation:

Thank you!

Thank you for completing our survey. We appreciate your time. If you would like to find out the results of the survey, please contact buildingbrainstogether@gmail.com.

Parenting is hard in isolation! Please call one of the family focused agencies for information and referrals during Covid-19.

FAMILY CENTRE

Lethbridge parents and families with children of 0-18 can call Family Centre to find help and resources in our community from 8:30 am to 4:30 pm Monday to Friday
Phone:(403) 320 4232. You can also leave a message at (403) 320 4232 x240 to talk to a Family Connector who will call back within a business day to provide more in-depth referrals. Email: info@famcentre.ca

BOYS AND GIRLS CLUB

BGCL Youth Centre provides info & referral for youth.
Social media: @bgclyouthcentre - Instagram @BGCL Youth Centre – Facebook @thematleth - Snapchat
Youth Services Phone: 403-634-7000. 10am – 2pm Monday – Friday
Child care information and referral Phone: 403-327-6423
Email: youthdirector@bgclethbridge.com

LETHBRIDGE FAMILY SERVICES

Info & referrals for families who are Permanent Residents, Temporary Residents, and Naturalized Canadian Citizens.
Phone: 403-320-1589 8:30am-4:30pm Monday to Friday

OPOKAA'SIN

Indigenous Family Resource Hub providing support and resources for Indigenous children, youth and families within the City of Lethbridge and surrounding areas. 8:30am-4:30pm Monday to Friday Phone: 403 380-2569 Email: info@opokaasin.org Support and inquiries can be found on Facebook, Twitter, Instagram, and YouTube @OpokaasinEISoc

FAMILY TIES

Parenting support 0-18 and general information regarding community agencies throughout south west Alberta. Phone: 403-336-4436 Monday to Friday 9:00am-4:00pm

Any door is the right door, all of the above agencies can help. ALL caregivers are welcome: parents, step parents, grandparents, foster parents, kincare families, aunties/uncles, guardians and extended family.

Appendix 6: Covid-19 Parent Stress and Resilience Survey Recruitment Email

Email Subject Line: University of Lethbridge and Building Brains Together Study – Covid-19 Parent Stress and Resilience Study

Dear _____,

My name is _____. I am writing on behalf of the Department of Neuroscience at the University of Lethbridge and Building Brains Together. Together we are studying the evolving impacts that the Covid-19 pandemic is having on families in the Lethbridge area.

We are inviting current and past participants in the BBT program to participate in a brief survey that would take 15-20 minutes to complete. Participation is anonymous and confidential. You will not be asked to provide any personal identifying information. The survey asks for a partial postal code in order to assess whether risk and protective factors are in any way linked to geographic areas. If you would rather not disclose this information, you may leave the answer blank. There are no anticipated risks to taking part in this survey and you can stop at any time and skip any questions that you wish.

If you have questions about the study or are interested in the findings, you may contact Building Brains Together at buildingbrainstogether@gmail.com. You may also contact the Office of Research Ethics at the University of Lethbridge at research.services@uleth.ca or 403-329-2747 if you have questions about your rights as a participant. This research has been reviewed for ethical acceptability and approved by the University of Lethbridge Human Participant Research Committee.

If you would be interested in completing the survey, please go to the following URL:

https://docs.google.com/forms/d/e/1FAIpQLSdh78Cg7HYlvOMWSKNEX37QSqufRhmsCD3o dUfULAaHtpB76g/viewform

Thank you in advance for your participation.
[Name]
[Title]
[Phone]
[Email]

Appendix 7: Covid-19 Parent Stress and Resilience Study Social Media Call Out

How has Covid-19 impacted you and your family?

Building Brains Together along with researchers from the University of Lethbridge invite you to share your experience as a parent during the Covid-19 pandemic. This study is a follow-up to the Covid-19 Parent Isolation Study and focuses on areas of stress and resilience for families.

Stress and resilience are both individual and community experiences. Data from this survey will be used to analyze the interplay of stress and resilience factors during the Covid-19 pandemic in order to help professionals, community members, and individuals respond to stress and develop resilience. All responses are anonymous and confidential. This survey should take between 15 and 20 minutes to complete.

This research has been reviewed for ethical acceptability and approved by the University of Lethbridge Human Participant Research Committee.

If you would like to participate, please follow the link below:

https://docs.google.com/forms/d/e/1FAIpQLSfETirlB_Y-A8DOuKIP24ZxUUHnYCy5033DPy0062SLbwFOLw/viewform

Thank you in advance for your participation!

Appendix 8: Covid-19 Parent Stress and Resilience Survey

Household

In the household in which you live, which best describes you?
Parent
Step-Parent
Foster Parent
Child
Grandparent
Roommate
I am living alone
Friend
Aunt/Uncle
Spouse (with no kids)
Cousin
Other:

Please choose which best describes your housing situation:
Mortgage
Renting
Own my/our home
Staying with relatives or friends
Not currently housed

Are you currently caring for children?
Yes No

If yes, what age of children are you currently caring for?

Please describe your current parenting situation:
Living full time with partner and child(ren)
Shared custody with child(ren)'s other parent
Caring for someone else's child(ren)
Single parent caring for child(ren) full time
Working out custody arrangement
Foster parent
Other:

How has Covid-19 impacted the amount of time you spend with your children?
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

How has Covid-19 impacted the amount of time your partner spends with your children?
N/A
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

How has Covid-19 impacted the amount of time your family spends playing together?
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Health

Is there anyone in your household with significant disability?
Yes No

Is there anyone in your household with a chronic illness?
Yes No

Is there anyone in your household who is currently immunocompromised?
Yes No

Has your family experienced the death of someone close to you since March 1st?
Yes
No

Was this death Covid-19 related?
Yes
No

Has anyone in your family/household been diagnosed with Covid-19?
Yes
No

Has anyone in your family/household had significant health treatments postponed due to Covid-19? (ie: surgeries, chemotherapy, physical therapies, mental health treatment, addiction treatment, etc.)
Yes
No

Was anyone in your family/household accessing counselling prior to March 15th?
Yes
No

If yes, did you/they lose access to this service during lockdown?
Yes
No

If yes, have you/they been able to re-access this service?
Yes
No

If you or someone in your household has attempted to access or re-access counselling since March 15th and has been unable to do so, please indicate what barrier(s) you have encountered?
N/A
Cannot afford due to lost benefits
Cannot afford due to lost income
Cannot access due to limited professionals
The service that I was accessing has been shut down
I am not ready to re-access
No longer need the services
Other: _____

How would you rate your overall feelings of loneliness?

1	2	3	4	5	6	7	8	9	10
Not at all lonely								Extremely lonely	

<u>Stress</u>
Please rate your current stress level:

1	2	3	4	5	6	7	8	9	10
Not at all stressed							Extremely stressed		

How much are each of the following adding to your stress during this time of isolation?

Finances
No stress Mild stress Moderate stress Much stress Extreme stress

Employment
No stress Mild stress Moderate stress Much stress Extreme stress

Rent/Mortgage/Housing security
No stress Mild stress Moderate stress Much stress Extreme stress

Education for myself
No stress Mild stress Moderate stress Much stress Extreme stress

Education for my child(ren)
No stress Mild stress Moderate stress Much stress Extreme stress

Relationship with my partner

No stress Mild stress Moderate stress Much stress Extreme stress

Relationship with my parents
No stress Mild stress Moderate stress Much stress Extreme stress

Relationship with my children
No stress Mild stress Moderate stress Much stress Extreme stress

Social isolation
No stress Mild stress Moderate stress Much stress Extreme stress

Parenting
No stress Mild stress Moderate stress Much stress Extreme stress

Caring for elderly relatives
No stress Mild stress Moderate stress Much stress Extreme stress

Grief
No stress Mild stress Moderate stress Much stress Extreme stress

My child(ren)'s return to school
No stress Mild stress Moderate stress Much stress Extreme stress

Family violence
No stress Mild stress Moderate stress Much stress Extreme stress

Addiction within the family
No stress Mild stress Moderate stress Much stress Extreme stress

My own health
No stress Mild stress Moderate stress Much stress Extreme stress

Health of my family members
No stress Mild stress Moderate stress Much stress Extreme stress

Access to food/medications
No stress Mild stress Moderate stress Much stress Extreme stress

Access to other essential items (ie: diapers, formula, medical supplies, etc.)
No stress Mild stress Moderate stress Much stress Extreme stress

Do *you* regularly (<u>once a week or more often</u>) experience any of the following? (Please check all that apply)

Pre Covid-19	Now	
☐	☐	Feelings of loneliness
☐	☐	Feeling worried about social situations beforehand
☐	☐	Feeling worried about social situations while you are with others
☐	☐	Thoughts or worries about yourself dying
☐	☐	Thoughts or worries about your loved ones dying
☐	☐	Thoughts or worries about death in general
☐	☐	Worries about getting sick
☐	☐	Worrying that regular body experiences are symptoms of Covid-19
☐	☐	Zoning out/losing time
☐	☐	Feeling lost
☐	☐	Tendency to people please
☐	☐	Having no real sense of the future or having trouble imagining the future
☐	☐	Frequent headaches
☐	☐	Frequent and/or unexplainable crying
☐	☐	Irritability
☐	☐	Racing thoughts
☐	☐	Trouble sitting still
☐	☐	Trouble paying attention or difficulty concentrating
☐	☐	Lack of energy/unexplainable fatigue
☐	☐	Inability to control anger/frustration
☐	☐	Muscle tension/soreness
☐	☐	Sleep disturbances (trouble falling asleep, staying asleep, restlessness at night, unsatisfying sleep, nightmares)
☐	☐	Trying to control the people around you
☐	☐	Excessive worry or concern when separated from the people you feel closest too
☐	☐	Increased arguments with partner
☐	☐	Increased arguments with children
☐	☐	Withdrawing from friends or family
☐	☐	Lack of interest in activities that were previously enjoyable

How much stress do these experiences/behaviours cause you?

No stress
Mild stress
Moderate stress
Much stress
Extreme stress

Do you take medication for anxiety and/or depression?
Yes
No

Has *your* use of the following substances changed over the last 6 months?
Alcohol:
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Cannabis:
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Smoking:
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Illicit Substances:
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Does your *partner* regularly (<u>once a week or more often</u>) experience any of the following?

Pre Covid-19	**Now**	**I don't know**	
☐	☐	☐	Feelings of loneliness
☐	☐	☐	Feeling worried about social situations beforehand
☐	☐	☐	Feeling worried about social situations while they are with others
☐	☐	☐	Thoughts or worries about dying
☐	☐	☐	Thoughts or worries about their loved ones dying
☐	☐	☐	Thoughts or worries about death in general
☐	☐	☐	Worries about getting sick

Pre Covid-19	Now	I don't know	
☐	☐	☐	Worrying that regular body experiences are symptoms of Covid-19
☐	☐	☐	Zoning out/losing time
☐	☐	☐	Feeling lost
☐	☐	☐	Tendency to people please
☐	☐	☐	Having no real sense of the future or having trouble imagining the future
☐	☐	☐	Frequent headaches
☐	☐	☐	Frequent and/or unexplainable crying
☐	☐	☐	Irritability
☐	☐	☐	Racing thoughts
☐	☐	☐	Trouble sitting still
☐	☐	☐	Trouble paying attention or difficulty concentrating
☐	☐	☐	Lack of energy/unexplainable fatigue
☐	☐	☐	Inability to control anger/frustration
☐	☐	☐	Muscle tension/soreness
☐	☐	☐	Sleep disturbances (trouble falling asleep, staying asleep, restlessness at night, unsatisfying sleep, nightmares)
☐	☐	☐	Trying to control the people around them
☐	☐	☐	Excessive worry or concern when separated from the people they feel closest too
☐	☐	☐	Increased arguments with partner
☐	☐	☐	Increased arguments with children
☐	☐	☐	Withdrawing from friends or family
☐	☐	☐	Lack of interest in activities that were previously enjoyable

How much stress do your partner's experiences/behaviours cause you?
No stress
Mild stress
Moderate stress
Much stress
Extreme stress

Does your partner take medication for anxiety and/or depression?
Yes
No

Has your *partner's* use of the following substances changed over the last 6 months?
Alcohol:
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Cannabis:
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Smoking:
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Illicit Substances:
Significantly decreased
Somewhat decreased
No change
Somewhat increased
Significantly increased

Does your *child* regularly (<u>once a week or more often</u>) experience any of the following?

Pre Covid-19	Now	
☐	☐	Stomach aches/nausea
☐	☐	Self-soothing behaviours (rocking, pacing, visible tics, repetitive behaviours, bouncing, etc.)
☐	☐	Picking behaviours (picking at body, face, pulling hair)
☐	☐	Acting below their age
☐	☐	Frequent temper tantrums
☐	☐	Expressions of loneliness
☐	☐	Feeling worried about social situations beforehand
☐	☐	Feeling worried about social situations while they are with others
☐	☐	Thoughts or worries about dying
☐	☐	Thoughts or worries about their loved ones dying
☐	☐	Thoughts or worries about death in general
☐	☐	Worries about getting sick

Pre Covid-19	Now	
☐	☐	Worrying that regular body experiences are symptoms of Covid-19
☐	☐	Zoning out/losing time
☐	☐	Feeling lost
☐	☐	Tendency to people please
☐	☐	Having no real sense of the future or having trouble imagining the future
☐	☐	Frequent headaches
☐	☐	Frequent and/or unexplainable crying
☐	☐	Irritability
☐	☐	Racing thoughts
☐	☐	Trouble sitting still
☐	☐	Trouble paying attention or difficulty concentrating
☐	☐	Lack of energy/unexplainable fatigue
☐	☐	Inability to control anger/frustration
☐	☐	Muscle tension/soreness
☐	☐	Sleep disturbances (trouble falling asleep, staying asleep, restlessness at night, unsatisfying sleep, nightmares)
☐	☐	Trying to control the people around them
☐	☐	Excessive worry or concern when separated from the people they feel closest too
☐	☐	Increased arguments with partner
☐	☐	Increased arguments with children
☐	☐	Withdrawing from friends or family
☐	☐	Lack of interest in activities that were previously enjoyable
☐	☐	Increased use of substances (alcohol, cannabis, illicit substances)

Does your child take medication for anxiety and/or depression?
Yes
No

How much stress do your child's experiences/behaviours cause you?
No stress
Mild stress
Moderate stress
Much stress
Extreme stress

Does anyone in your family have any diagnoses that you think may contribute to these experiences? (For example a family member with diagnosed anxiety disorder, autism spectrum disorder, developmental delay, cancer, addiction, etc.)

School

Did you attempt at home learning for your children for April-June?
N/A
No
Yes

Which option did you select for your children for fall of 2020?
N/A
In school learning
At home learning
Home Schooling

I was satisfied with the support I received in helping my child(ren) to finish out the school year:
N/A
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

How much stress did this decision cause you?
N/A
No stress
Mild stress
Moderate stress
Much stress
Extreme stress

I have been satisfied with the communication provided about school programming in the fall of 2020
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I am satisfied with the plan that is currently in place in my district for reopening schools
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Do you feel as though your needs and concerns regarding your child(ren)'s schooling have been heard?
N/A
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

If no, who would you like to have listen to you?

What concerns are you experiencing about your child(ren) going back to school?
I am not concerned about the return to school
Class sizes
Social distancing
Cleaning protocols
Exposure to many different people
Screen time
Lack of devices in the home
Lack of alternate childcare and/or supervision
Impact on social development
Impact on educational development
Child's health
Personal health
Children's health
My family members' health
How I will get time off work/find childcare if my child(ren) are sent home from school for 14 days
How many days my child(ren) will miss if they are quarantined from school
Working while my child(ren) are doing at home learning
Being available to support my child(ren)'s at home learning
Doing at home learning without the school supports my child needs
Lost school supports due to budget cuts and layoffs
Other: _____

Employment

Has your employment and/or income been impacted since March 1st, 2020?
My employment status has remained the same
I was laid off
My hours were reduced
I was self-employed and my income potential has been reduced
I was self-employed and am no longer generating income
My hours have increased
I have left or reduced work in order to care for children or other family members

If your employment was impacted, have you returned to your initial employment status?
Yes No N/A

If married/common law, has your partner's employment been impacted since March 1st, 2020?
N/A
My partners' employment status has remained the same
My partner was laid off
My partners' hours were reduced
My partner is self-employed and their income potential has been reduced
My partner is self-employed and they are no longer generating income
My partner's hours have increased
My partner has left or reduced work in order to care for children or other family members

If your partner's employment was impacted, have they returned to their initial employment status?
Yes No N/A

Have you lost medical/health benefits (or had your benefits reduced) due to employment impacts?
Yes
No

What is your current household monthly net income?
$0-$2000
$2001-$4000
$4001-$6000
$6001-$8000
$8001 or above

Is anyone in your household collecting Canada Emergency Response Benefit (CERB) payments?
No one
Myself
My partner
Both myself and my partner

Resilience Factors

I am able to maintain strong relationships with the important people in my life
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My child(ren) are able to maintain strong relationships with the important people in their lives
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My child(ren) are currently involved in community activities that they enjoy (dance, church groups, sports, etc.)
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My family has established a daily routine
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I believe that I have control over what is happening in my life
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I am finding ways to take care of myself (as well as my family)
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My family is able to work through disagreements respectfully
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I know what my family needs to be healthy during this time
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I am able to access what my family needs during this time
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

My family is flexible when dealing with change
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

When I am fearful or worried, I find it easy to calm myself down
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

When my child(ren) are fearful or worried, it is generally easy for me to calm them down
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

I know how to comfort my child(ren) when they are upset
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

In our household we express our feelings safely
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Looking back over the last 6 months of the pandemic, I believe that my family has adjusted well to the changing circumstances
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Is there anything else that you would like us to know about the impact of Covid-19 and isolation of you and/or your family?

<u>Demographics</u>

Age (in years):

Gender:
Female
Male
Non-binary
Two-spirit
Other:

First Three Digits of Postal Code:

Ethnicity:

Thank you!

Parenting is hard in isolation! Please call one of the family focused agencies for information and referrals during Covid-19.

FAMILY CENTRE

Lethbridge parents and families with children of 0-18 can call Family Centre to find help and resources in our community from 8:30 am to 4:30 pm Monday to Friday
Phone:(403) 320 4232. You can also leave a message at (403) 320 4232 x240 to talk to a Family Connector who will call back within a business day to provide more in-depth referrals. Email: info@famcentre.ca

BOYS AND GIRLS CLUB

BGCL Youth Centre provides info & referral for youth.
Social media: @bgclyouthcentre - Instagram @BGCL Youth Centre – Facebook @thematleth - Snapchat
Youth Services Phone: 403-634-7000. 10am – 2pm Monday – Friday
Child care information and referral Phone: 403-327-6423
Email: youthdirector@bgclethbridge.com

LETHBRIDGE FAMILY SERVICES

Info & referrals for families who are Permanent Residents, Temporary Residents, and Naturalized Canadian Citizens.
Phone: 403-320-1589 8:30am-4:30pm Monday to Friday

OPOKAA'SIN

Indigenous Family Resource Hub providing support and resources for Indigenous children, youth and families within the City of Lethbridge and surrounding areas. 8:30am-4:30pm Monday to Friday Phone: 403 380-2569 Email: info@opokaasin.org Support and inquiries can be found on Facebook, Twitter, Instagram, and YouTube @OpokaasinEISoc

FAMILY TIES

Parenting support 0-18 and general information regarding community agencies throughout south west Alberta. Phone: 403-336-4436 Monday to Friday 9:00am-4:00pm

Any door is the right door, all of the above agencies can help. ALL caregivers are welcome: parents, step parents, grandparents, foster parents, kincare families, aunties/uncles, guardians and extended family.