Exploring the Impact of COVID-19 on Students' Use of Smartphones for Leisure Coping

by

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To John and Lise Ausman: Brilliant writers and loving parents.

I had fun and learned something. J't'aime.

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ABSTRACT

Leisure coping among post-secondary students is important for maintaining good mental health, and smartphones have been found to play a role in coping. Little is known about the use of smartphones for leisure coping or the impacts of the COVID-19 pandemic on student mental health, coping, leisure, and smartphone use. Through a mixed-methods design, this study aimed to explore Nova Scotia post-secondary students' use and relationships with smartphones, the role smartphones play in leisure coping, and how this may have been impacted by the COVID-19 pandemic. Results found that students' relationships with their smartphones are based on their use and considered some uses to be positive or negative. Results also showed that students not only use their smartphones for leisure coping but also consider them to be effective coping. Finally, students report short-term impacts of the COVID-19 pandemic on their smartphone use, smartphone relationships, and use for leisure coping.

LIST OF ABBREVIATIONS USED

BRS – Brief resilience scale

COVID-19 – severe acute respiratory syndrome coronavirus 2

CTRS – Certified therapeutic recreation specialist

GAD-7 – Generalized anxiety disorder 7-item scale

$H_0$1 and $H_0$2 – Null hypothesis 1 and 2

H1 and H2 – Hypothesis 1 and 2

IAO – Immediate adaptational outcomes

ICT – Information and communication technology

LCBS – Leisure coping beliefs scale

LCBS-SF – Leisure coping beliefs scale short-form

LCSS – Leisure coping strategies scale

LCSS-SF – Leisure coping strategies scale short-form

LGBTQ2SIA+ - lesbian, gay, trans, queer, two-spirited, intersex, asexual, and more

M - Mean

NS – Nova Scotia

PSS – Perceived stress scale

SAS – Smartphone addiction scale

SB-LCBS-SF – Smartphone-based leisure coping beliefs scale short-form

SB-LCSS-SF – Smartphone-based leisure coping strategies scale short-form

SD – Standard deviation

SPSS – Statistical analysis software

TR – Therapeutic recreation

U.S. – United States

WHO – World Health Organization

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CHAPTER 1 INTRODUCTION

With the dawn of the Coronavirus disease 2019 (COVID-19) pandemic, which quickly spread across the globe, came a variety of uncertainties and questions. As this pandemic changed (and continues to change) the lives of many in a variety of ways, how were people impacted? Were mental health and coping strategies transformed due to changes in resources and information communication? In a time where technology connects individuals to people, information, and leisure, how were individuals' relationships with technology altered? These are only a small number of questions addressing the potential impacts of the COVID-19 pandemic on people's lives.

Post-secondary students continue to be one of the main populations affected by serious mental health challenges. Mental wellness and coping are important topics with this population, and little has yet been published regarding how these were impacted by the COVID-19 pandemic. To understand these changes, current student coping experiences must be compared, retrospectively, to those before the pandemic. As the research hereafter explores the experiences of students attending a Nova Scotia post-secondary institution, it is important to note that the research took place in the Fall 2020 semester. Months leading up to this research and during data collection, these students also experienced and witnessed unexpected trauma and notable worldwide events which could have seriously impacted their mental health. Starting with the global COVID-19 pandemic, these students were told to work and learn from home on March 15th (Roth et al., 2020). On April 29th, Canada's worst mass shooting took the lives of 22 Nova Scotians (Petracek, 2021). On May 25th, George Floyd was murdered by police in Minneapolis, which ignited public outrage, anger, and sadness, leading to Black Lives Matter protests across millions of cities worldwide (Deliso, 2021). Finally, although American politics do not directly

affect many Nova Scotians, the American presidential election was a notable event in November 2020 due to the polarizing candidates, their platforms, and the hateful and racist messages connected to one presidential candidate (Wolf & Mullery, 2020). Although this research focused on the effects and impacts of the COVID-19 pandemic, this information contextualizes results as students were experiencing more than just regular or pandemic-related stress.

In addition to mental health, it is important to consider coping and resilience. As students learned to cope with the added pandemic and traumatic stressors, leisure became a central resource for building their resilience to handle these added stressors. However, due to stay-at-home orders and physical distancing restrictions, many students turned to their smartphones to connect with loved ones, to learn and gather information, and to participate in leisure. The focus of this research was to explore the role of smartphones in leisure coping, how this may have impacted student mental health, and how the COVID-19 pandemic may have changed all of it.

1.1 COVID-19

The term *coronavirus* refers to a negatively stranded ribonucleic acid (RNA) virus which commonly causes respiratory infections (Kahn, 2006). In December 2019, a virus named severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2), started spreading globally, also referred to as coronavirus disease, 2019-nCov (new coronavirus disease or novel coronavirus), or COVID-19 (World Health Organization, 2019b). On January 30th, 2020, the World Health Organization (WHO) designated the COVID-19 outbreak as a "public health emergency of international concern" (World Health Organization, 2020b). As of June 8th, 2021, there have been 174,431,352 confirmed cases with 3,753,856 deaths worldwide (WorldOMeter, 2021). In

light of these statistics, there was an interest in exploring how this virus may affect people's health, including their mental health.

Interest in the connections between pandemics and mental health is not new. In fact, post-influenza depression was discussed by Tuke (1892) and Harrison (1958) in England. Pandemics, epidemics, and outbreaks have previously been connected to several negative impacts on mental health, such as anxiety (Taylor, 2019), worry and fear (Angus Reid Institute, 2020), and the multitude of psychological impacts due to quarantining (Brooks et al., 2020). Although some research has focused on the biological connections between mental health and being infected with a respiratory virus (Okusaga et al., 2011), it is important to understand how living in the time of a global pandemic and experiencing changes in daily life may impact mental health. Early studies on the mental health impacts of the COVID-19 pandemic have shown evidence of increased anxiety (Kirton, 2020; Peischel, 2020) and psychological distress (Qiu et al., 2020). A study of post-secondary students in Poland found 65% of students showed mild to severe anxiety and 56% showed high levels of perceived stress (Rogowska et al., 2020). Considering post-secondary students experienced significant stressors due to the COVID-19 pandemic, including possibilities such as school-related closures/transitions, job loss, financial challenges or insecurity, family or relationship challenges, and in some cases death, an investigation of the mental health impacts of this pandemic is imperative. Little is currently known regarding the long-term impacts this pandemic will have on public mental health, more specifically, on populations known to be vulnerable to poor mental health, such as post-secondary students. Early data regarding the impacts of the COVID-19 pandemic on public health is available, but more research will become available in the coming year as research concludes and is disseminated.

1.2 Mental Health & Post-Secondary Students

Mental health is often used as an umbrella term, but is defined as:

> *The capacities of each and all of us to feel, think, and act in ways that enhance our ability to enjoy life and deal with the challenges we face. It is a positive sense of emotional and spiritual well-being that respects the importance of culture, equity, social justice, and interconnections, and personal dignity*. (Government of Canada, 2006, p. 2)

In other words, all individuals have mental health, but it can range from optimal mental health to poor mental health (Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013). A commonly experienced mental health challenge among students is perceived stress (i.e., perceived threat of a stressor) stemming from a variety of sources: lack of positive social support, work, less parental guidance, academics, finances, and health (Dusselier et al., 2005; Marriott, 2015). Perceived stress has been positively associated with increased feelings of anxiety (e.g., tension, fear, worry, feeling that something is not going well) among post-secondary students (Andreou et al., 2011; Cohen et al., 1983). As post-secondary students are at risk for experiencing mental health challenges on a regular basis, it is important to note how this population might be impacted by stressors stemming from the COVID-19 pandemic for post-secondary institutions to provide informed and comprehensive mental health services and resources to students to help them cope.

1.3 Coping & Resilience

Coping has been defined as thoughts and behaviours used to manage the internal and external demands of situations that the individual has appraised as stressful (Folkman & Lazarus,

1980; Lazarus & Folkman, 1984). As this definition became widely accepted (Tennen et al., 2000), a variety of measurement tools were developed (e.g., Billings & Moos, 1981; Folkman & Lazarus, 1980; Pearlin & Schooler, 1978). Over time, numerous empirical studies on coping were conducted and have led to new measures and tens of thousands of studies being published (Somerfield & McCrae, 2000). Although there is more current research on coping, many of the original coping theories and concepts continue to be used and will be described throughout this research.

Coping research with post-secondary students is common (e.g., Khanagar et al., 2021; Labrague et al., 2017), and has even been a topic during the COVID-19 pandemic (e.g., Majrashi et al., 2021). Given the levels of perceived stress experienced, post-secondary students use a variety of coping strategies to help manage their perceived stress. It was found that higher stress tolerance is associated with feeling well supported, increased social interactions, regular contact with family, getting enough sleep, proper nutrition, regular exercise, sense of control, and leisure time (Welle & Graf, 2011). Some of these may be more so associated with problem-focused coping (attending to the stressor) while others align with emotion-focused coping (attending to emotions). Social support has often been identified as a major coping strategy among students (Roming & Howard, 2019; Thompson et al., 2016), although other coping strategies have also been identified, such as alcohol use (e.g., Patrick et al., 2011) and use of smartphones (Grellhesl & Punyanunt-Carter, 2012; Nehra et al., 2012; Panova & Lleras, 2016).

Ultimately, the importance of effective coping lies in its ability to increase resilience, which is the capacity to positively adapt when facing adversity, trauma, or stress (Masten, 2001). Resilient individuals are more adaptable in high-stress situations, such as a pandemic, and have lower psychological distress (Smith & Carlson, 1997; Thompson et al., 2016). Higher resilience

among post-secondary students has been found to improve their general well-being and quality of life satisfaction by lowering perceived stress (Abolghasemi & Taklavi Varaniyab, 2010; Tung et al., 2014). This begs the question: what coping approaches, behaviours, or strategies help increase resilience? Interestingly, leisure has been identified as a coping strategy that may lead to higher resilience by providing alternative and positive experiences and deflecting stressful thoughts and emotions (Joudrey & Wallace, 2009; Mausbach et al., 2012). Yet, the connection between post-secondary student mental health, resilience, and leisure coping has scarcely been examined as prior research primarily focused on coping mechanisms or approaches more generally (Howe et al., 2012; Thompson et al., 2016).

1.4 Leisure Coping

Although there are many definitions of *leisure*, this study defines leisure as enjoyable activities participated in during one's free time (Kleiber, 1999). Leisure has been studied for its ability to help people cope with stress, termed *leisure coping* (also referred to as leisure-based coping, leisure stress-coping, leisure-based stress-coping), which has been found to help maintain or improve general health and mental health (Caltabiano, 1994, 1995; Cheng et al., 2018; Coleman, 1993; Coleman & Iso-Ahola, 1993; Denovan & Macaskill, 2017; Driver et al., 1991; Hull & Michael, 1995; Iso-Ahola, 1997; Iso-Ahola & Park, 1996; Iwasaki & Mannell, 1999; Iwasaki & Smale, 1998; Nagata et al., 2018, 2019; Patterson & Coleman, 1996; Zuzanek et al., 1998). Specifically, among post-secondary students, participation in leisure has been shown to provide a variety of health benefits: emotional well-being (Zhang & Zheng, 2017), improved mental health (Johnson & Kalkbrenner, 2017), social adaptation (Zerengok et al., 2018), and building coping strategies (Kimball & Freysinger, 2003). These health benefits

demonstrate the power of leisure and the potential for its use as a coping resource and/or strategy. A study on university students found that leisure coping beliefs and strategies were significant predictors of positive adaptational outcomes (i.e., coping effectiveness), and were significantly better predictors for these positive adaptational outcomes than general coping strategies not directly associated with leisure (Iwasaki, 2001). Leisure has been connected to immediate adaptational outcomes which lead to improved health and well-being (Iwasaki, 2003). As leisure is personal to each individual, it is an opportunity for each person to seek something meaningful and beneficial from their leisure. Once an individual discovers how their leisure contributes to managing their stress, their leisure can be an important resource and/or strategy to successfully manage stressors in their everyday lives (Iwasaki, 2003). One possible example of this is the use of smartphones among post-secondary students, which is the focus of the current study.

1.5 SMARTPHONES

As technology continues to advance and be an integral part of people's lives, so has research on technology's connection to mental health. Mobile phone literature, for example, uses a variety of terms, depending on the type of technology being studied: mobile phone technology, smartphones, or information and communications technology (ICT). ICTs include the Internet, wireless networks, mobile phones, smartphones, and other communication mediums (Christensson, 2010a). *Smartphones* are the most recent mobile phone technology with advanced capabilities beyond calling and texting: displaying photos, playing videos, viewing and sending e-mail, accessing the Internet, playing games, as well as downloading and using applications that have endless functionalities (Christensson, 2010b). The Internet plays a large role in the lives of

post-secondary students as it is used for many aspects of life including school, work, and leisure (Oblinger, 2003; Pardue & Morgan, 2008). As smartphones provide access to the Internet among other capabilities, it is no surprise that 97.9% of Canadians between the ages of 15 and 24 have a smartphone (Statistics Canada, 2018b).

Smartphones have been connected to leisure, most notably regarding the applications (apps) available on smartphones. Some gaming apps have been studied for their ability to provide flow experiences (Merikivi et al., 2017), while others are studied for their potential in motivating users to participate in physical activity (Gabbiadini et al., 2018; Gillman & Bryan, 2016) and spend more time outdoors (Kaczmarek et al., 2017).

Although the positive connection between smartphones and leisure has been largely accepted, the connection between smartphones and health remains less clear. Some researchers argue that the use of smartphones leads to poor mental health (Beranuy et al., 2009; Murdock, 2013; Park et al., 2010; Reid & Reid, 2007; Sánchez-Martínez & Otero, 2009; Thomée et al., 2010), while other researchers suggest that individuals with poor mental health use smartphones to cope (Deatherage et al., 2014; Grellhesl & Punyanunt-Carter, 2012; Nehra et al., 2012; Panova & Lleras, 2016). A recent study by Panova and Lleras (2016) was the first to test this in an experimental setting, and results demonstrated that mobile phones could increase an individual's resilience to stressful events. As smartphone technology is still fairly recent, research is needed to determine the true role of smartphones in coping among post-secondary students, especially in the context of a global pandemic.

The arrival of the COVID-19 pandemic has brought on its own set of mental health challenges connected to technology, such as negative impacts of media exposure to traumatic events (Garfin et al., 2020; Holman et al., 2014) and for receiving health information (Taha et al.,

2014), similar to previous viral outbreaks. During the H1N1 pandemic, it was found that people preferred to receive health information through watching television (Glik, 2007; Rogers et al., 2009; Vaughan & Tinker, 2009). As this was prior to the development of smartphone technology that is present today, social media presents a unique opportunity for communicating health information to the public during times of crisis such as the COVID-19 pandemic (Lachlan et al., 2016).

1.6 SUMMARY

In summary, there are still many gaps in the literature related to each of these concepts—impacts of the COVID-19 pandemic, student mental health, coping, resilience, leisure, and smartphone use—and the relationships between them. There is a need to examine potential mental health impacts of the COVID-19 pandemic, specifically regarding perceived stress and feelings of anxiety among post-secondary students. It is also unclear how the pandemic impacted students' coping, resilience, and leisure. As smartphones may be used as a tool for leisure and/or coping, it is imperative that the student-technology relationship be examined, while also determining if this relationship does, in fact, represent leisure coping. The potential health-promoting role of smartphones presents a unique platform for post-secondary institutions to provide mental health services. With the increasing use of smartphones around the world, there is an interest in understanding how daily smartphone habits and coping mechanisms can influence the current generation of students' mental health and future mental health service delivery.

This research study aimed to determine the role smartphones play as a form of leisure coping among post-secondary students, and how this may have been impacted by the COVID-19 pandemic. The main research question guiding this study was as follows: *What is the*

relationship between smartphone use as a form of leisure coping, mental health, and resilience among post-secondary students, and has it been changed by the COVID-19 pandemic? Through a concurrent mixed-methods design, this study collected data regarding smartphone use and relationships, stressors, leisure coping beliefs and strategies, immediate adaptational outcomes, mental health (perceived stress and feelings of anxiety), resilience, and personal experiences, both recently (during the COVID-19 pandemic) and retrospectively (prior to the COVID-19 pandemic) among Nova Scotia post-secondary students. This study will inform future research in a variety of fields (smartphones, coping, leisure, and student mental health literature) and post-secondary institutions for future changes to student mental health practice and policy.

CHAPTER 2 LITERATURE REVIEW

2.1 PANDEMICS, EPIDEMICS, & OUTBREAKS

To understand the impact of a pandemic such as COVID-19, it is important to differentiate the term *pandemic* from other terms used when speaking about viruses and illnesses. An *outbreak* is a sudden increase in a condition or disease cluster, while an *epidemic* is a widespread occurrence of an infectious or non-infectious disease in a community during a particular time (Moukaddam, 2019). A *pandemic* is an epidemic that crosses country and continent boundaries, and therefore has more widespread impacts across the world and becomes a source of concern for more people (Moukaddam, 2019). Examples of pandemics include the 1345 black plague, the 1918 influenza pandemic, the 2003 SARS pandemic, and the 2009 H1N1 pandemic. As research has previously demonstrated the tremendous impacts of pandemics on public mental health, it has already been recommended that research focusing on health outcomes related to the COVID-19 pandemic include the potential impacts on mental health (Asmundson & Taylor, 2020b). It should be noted that the information presented in this research has been based on early accounts and research into the impacts of the COVID-19 pandemic. As studies continue to explore these impacts and researchers disseminate their results, it is expected that knowledge related to the impacts of the COVID-19 pandemic will continue to grow.

2.1.1 Worry, Fear, and Anxiety

When it comes to mental health and the COVID-19 pandemic, a poll of 1,354 Canadian adults in early February 2020 (early stages of the pandemic) found that a third of respondents identified being worried about the virus, with 7% stating they are “very concerned” about becoming infected (Angus Reid Institute, 2020). In this worried state, many people were

increasing avoidance behaviours such as avoiding public transit and public places (Angus Reid Institute, 2020). In addition to this, the lack of confidence in the healthcare system fueled fear in many communities, similar to previous epidemics and pandemics (Angus Reid Institute, 2020; Taylor, 2019). In June 2020, although case numbers were starting to decline from the first wave, Canadians were increasingly worried about the virus due to the surge in cases in the United States (Dunham, 2020). The fear surrounding the COVID-19 pandemic was also likely due to its novelty (Asmundson & Taylor, 2020a). Ambiguity of information combined with an invisible threat, like a virus, can lead to increased fear and worry, demonstrating the importance for accurate and effective communication of health information (Garfin et al., 2020).

Some preliminary information regarding the mental health impacts of the COVID-19 pandemic has started to emerge from countries who were impacted earlier than others. A nationwide survey in China (31 January-10 February, 2020) found that nearly 35% of respondents had experienced psychological distress due to the COVID-19 pandemic, with women showing significantly higher scores of psychological distress than men (Qiu et al., 2020). A survey published in February 2020 from the Chinese Psychology Society found that 42.6% of people had symptoms of anxiety (Kirton, 2020). In the United States, even during the early stages of the pandemic, the National Alliance on Mental Illness received a large increase of phone calls (Peischel, 2020). Also, the non-profit organization Mental Health America reported a significant increase (up 19%) in online anxiety self-screening test completion within February 2020 (Peischel, 2020). Although the full extent of mental health impacts of the COVID-19 pandemic is not yet clear, one review explored the available literature and found that there is and will be a rise in the prevalence of psychiatric disorders among people with no previous mental

health problems (Byrne et al., 2021). It is also expected that people with previous mental health problems are prone to worsening of psychiatric symptoms (Byrne et al., 2021).

Vulnerability factors that can increase someone's fear of COVID-19 (also termed *coronaphobia*) include intolerance of uncertainty, perceived vulnerability to disease, and proneness to anxiety or worry (Taylor, 2019). Fears may also be fueled by lack of information and misinformation through media headlines (Taylor & Admundson, 2004). Ultimately, the importance of addressing the fears and mental health surrounding pandemics and epidemics is to prevent a flood of "worried well" patients in hospitals who mistakenly interpreted symptoms as having contracted the virus (Taylor, 2019). This is an example of health anxiety, which in itself can be detrimental and is an influencing factor on the success of public health strategies (Asmundson et al., 2010; Taylor, 2019; Taylor & Admundson, 2004), and therefore demonstrating the importance of effective coping strategies that will support rather than worsen health outcomes during a pandemic.

2.1.2 Impacts of Media

During a health crisis, people increase their reliance on media to receive accurate and up-to-date information (Ball-Rokeach & Defleur, 1976; Glik, 2007; Jung, 2017; Li et al., 2019; Ranjit et al., 2020). This type of reliance can be positive as people tend to form more accurate perceptions of risk and abide by recommended health protective behaviours when information is communicated effectively through media (Fischhoff et al., 2018). However, when information is unknown or ineffectively communicated, there can be heightened appraisals of threat, increased uncertainty, and feeling of uncontrollability as well as increased anxiety, as was seen during the H1N1 outbreak (Taha et al., 2014). The WHO coined the term *infodemic*, referring to an

overabundance of information, with varying degrees of accuracy, making it difficult for individuals to determine trustworthy and reliable sources (World Health Organization, 2020a).

Repeated media exposure regarding a pandemic can lead to psychological distress (Garfin et al., 2020). In fact, the earlier mentioned study in China found that psychological distress scores were higher among the young adult group (18-30 years old) and it was suggested that this was due to the increased exposure to information and media which may trigger stress (Qiu et al., 2020). There has already been some evidence of collective trauma due to increased media exposure during the COVID-19 pandemic (Chao et al., 2020). This impact of media is not new as similar patterns were seen during the Ebola outbreak in 2014, where U.S. residents with heightened media exposure to Ebola-related stories were found to also have increased distress and worry (Thompson et al., 2017). This type of heightened stress response during threatening events are associated with long-term physical and mental health outcomes, such as cardiovascular disorders and post-traumatic stress (Garfin et al., 2018; Holman et al., 2008; Silver et al., 2013).

It is important to note that it is both the amount and type of media exposure that can affect psychological outcomes. For example, increased exposure to the media coverage of the Boston Marathon bombing was associated with acute stress symptoms, and those with the highest media exposure actually reported higher acute stress than individuals who directly experienced the bombings (Holman et al., 2014). A cycle of distress may then emerge as those with higher levels of concern seek out more media coverage, further increasing their stress response (Garfin et al., 2015; Thompson et al., 2019). In terms of types of media exposure, graphic image content within media was associated with heightened post-traumatic stress and fear (Holman et al., 2020). Notably, early research regarding media exposure during the COVID-

19 pandemic found that “new media” use (e.g., online news, social media) was associated with negative psychological outcomes, while the use of ‘”traditional media” (e.g., television, radio, newspapers) was not (Chao et al., 2020). The impact of media on mental health is evident, and it is therefore important to determine how the public may access and receive public health information while decreasing exposure to potentially harmful media exposure. Research into the potential use of smartphones for a variety of purposes, including receiving public health information, may be increasingly important as people are often required to stay home during pandemics and outbreaks.

2.1.3 Impacts of Quarantine

One common requirement for many individuals during pandemics and outbreaks is quarantine or isolation. The difference between these terms is that *isolation* is the separation of infected individuals from those who are not infected, and *quarantine* is the separation of individuals who were potentially exposed and the restriction of their movement (Centers for Disease Control and Prevention, 2020). During the COVID-19 pandemic, a large-scale quarantine was implemented across the world where individuals were asked to quarantine themselves at home or in specific quarantine facilities to avoid or decrease exposure to the virus in an effort to protect themselves and others (Brooks et al., 2020).

Quarantine is often an unpleasant experience that may leave individuals feeling separated from loved ones, experiencing a loss of freedom, and feeling uncertain regarding health/disease status (Brooks et al., 2020). Quarantined individuals have previously shown to experience a variety of negative effects on their mental health: emotional disturbances (e.g., Yoon et al., 2016), confusion, anger, and fear (e.g., Caleo et al., 2018), stress and insomnia (e.g., DiGiovanni

et al., 2004), nervousness, post-traumatic stress symptoms, and guilt (e.g., Reynolds et al., 2008), as well as depression (e.g., Hawryluck et al., 2004). As seen during the SARS outbreak, quarantined individuals have shown to experience more exhaustion, detachment from others, anxiety, irritability, insomnia, poor concentration and indecisiveness, deterioration of work performance, and reluctance to work or consideration of resignation compared to non-quarantined individuals (Bai et al., 2004). Quarantine was also identified as a predictor for post-traumatic stress disorder (Sprang & Silman, 2013; Wu et al., 2009) and depression at a later date (Liu et al., 2012). Stressors experienced during quarantine that can play a role in psychological impacts of quarantine are the duration of quarantine, fears of infection, frustration and boredom, inadequate supplies, and inadequate information (Brooks et al., 2020). But how will these quarantine-specific stressors, in addition to the worry and fear related to pandemics, impact students who are already experiencing mental health challenges on a regular basis?

2.2 Post-Secondary Students & Mental Health

As mentioned earlier, the focus of this study will be perceived stress and feelings of anxiety among Nova Scotia post-secondary students. The term *stress* is the physiological and behavioural response to a stimulus, with the brain acting as the interpreter to define what is stressful (Oken et al., 2015). But, the stressfulness of a situation is dependent on an individual's perception of threat the stressful situation poses on their ability to manage or adapt cognitively and behaviourally, termed *perceived stress* (Caplan, 1981; Lazarus & Folkman, 1984, 1987; Thoits, 1995). An important and highly discussed response to perceived stress is anxiety (Beiter et al., 2015). There is a difference between *feelings of anxiety* (e.g., tension, fear, worry, feeling that something is not going well) that everyone will experience, and an *anxiety disorder*

(irrational/excessive fear, apprehensive and tense feelings, difficulty managing daily tasks and/or distress related to these tasks) (Rector et al., 2005). It is important to note that anxiety is not directly caused by stressors but is the state of the individual resulting from their perception and reaction to those stressors (Beck & Clark, 1997). For the context of this study, the terms *perceived stress* and *feelings of anxiety* will be used, but it should be noted that the literature reviewed uses these terms interchangeably with *stress* and *anxiety*, respectively. As these terms do not represent diagnosed mental illnesses, these will also be referred to as *mental health challenges* as they pose a risk to optimal mental health.

Within Canada, a 2019 survey of post-secondary students (N = 55,284) found the following mental health related symptoms experienced the previous year: 76.2% feeling very sad; 68.9% feeling overwhelming anxiety, 51.6% expressed feeling depressed to a level of it affecting their functioning; and an alarming 16.4% seriously considered suicide (American College Health Association, 2019). In terms of academic impacts, within a year of the survey, 34.6% reported negative impacts from anxiety and 41.9% from stress (American College Health Association, 2019). A large percentage of students in this survey identified having experienced "more than the average stress" (45.6%), or even "tremendous stress" (15.3%)(American College Health Association, 2019).

It is clear that mental health challenges are common among post-secondary students, and they can range in severity. The negative consequences of perceived stress include the development or worsening of chronic diseases (Brosschot et al., 2006; Cohen et al., 2007; Dougall & Baum, 2011), and/or neurologic and psychiatric diseases (Burns et al., 2014; Cleck & Blendy, 2008; Hemmerle et al., 2012; Novakova et al., 2013). The impacts of poor mental health on students is not only distress during important times of major life transitions, but can also

impair academic performance (Auerbach et al., 2016; Bruffaerts et al., 2018) and increase the possibility for suicidal thoughts and behaviours (Mortier et al., 2018). Specifically, more perceived stress among students has been associated with poor nutrition (Mikolajczyk et al., 2009), alcohol abuse (Tavolacci et al., 2013), and maladaptive coping (Talib & Zia-ur-Rehman, 2012; Wichianson et al., 2009). Unmanaged prolonged stress can also lead to *burnout*, characterized by the following: feelings of energy depletion or exhaustion, increased mental distance from one's work or feelings of negativism or cynicism related to one's work, and reduced professional efficacy (World Health Organization, 2019a). Burnout, in turn, can also lead to more mental health concerns, such as increased suicidal ideation (Dyrbye et al., 2008).

In terms of the Nova Scotia (NS) population, 20.1% of 18- to 34-year-old adults in 2019 perceived to have fair/poor mental health as opposed to good/excellent (Statistics Canada, 2019). There is a need for more Nova Scotia data regarding current mental health challenges (i.e., perceived stress and feelings of anxiety) among post-secondary students. A 2012 survey across NS youth (ages 12-18) found that 8.7% of students met the criteria for very elevated depressive symptoms, and 21.2% of these students reported needing help for their symptoms of depression (Asbridge & Langille, 2013). Although depression and suicidal behaviours are more related to mental illness, these often stem from poor mental health, including elevated perceived stress (Centre for Addiction and Mental Health, n.d.). Although these surveys do not represent the post-secondary population, it demonstrates the mental health of those who will soon be entering post-secondary education, demonstrating the overall need for mental health supports in NS. As this study collected data regarding current prevalence of perceived stress and feelings of anxiety among NS post-secondary students, more recent data will become available, helping paint a picture of current student mental health in the province.

2.2.1 Marginalized Populations

Marginalized populations are described as groups of individuals who have been "excluded from mainstream social, economic, educational, and/or cultural life" with examples including "groups excluded due to race, gender identity, sexual orientation, age, physical ability, language, and/or immigration status" (Sevelius et al., 2020, p. 2009). The NS population is largely heterosexual, cis-gendered, White, and living without a disability. However, the NS population, like the larger Canadian population, is not homogeneous and is made up of a variety of marginalized populations, including individuals who are LGBTQ2SIA+ (lesbian, gay, bisexual, trans, queer, two-spirited, intersex, and more), Black, Indigenous, and/or living with a disability. It is estimated that 13% of the Canadian population identifies as part of the LGBTQ2SIA+ community (Foundation Jasmin Roy, 2017), and the NS population may infer a similar estimate. According to the 2016 Canadian Census data, the population of NS includes 58,650 individuals with a visible minority, of which 21,915 (37.4%) are Black and 1,385 (2.4%) are a part of multiple visible minorities (Statistics Canada, 2017). The 2016 Census also reports a nationwide Indigenous population of 1,673,785 (which includes First Nations, Métis, and Inuit populations), with 51,495 (3.1%) living in Nova Scotia (Statistics Canada, 2017). A 2018 report found that 30.4% of Nova Scotians live with a disability, 8.1% higher than Canada as a whole (Devet, 2018). Marginalized populations are known to experience differing levels of mental health challenges as compared to the general population.

Individuals who identify as part of the LGBTQ2SIA+ community experience differing challenges than non-LGBTQ2SIA+ folks, but also as compared to each other as some experience marginalization due to their sexual orientation, while others may also experience marginalization

due to gender identity or gender expression (Messman & Leslie, 2019; Taylor et al., 2013). For example, a 2014 Canadian survey found that 33.4% of homosexual and bisexual respondents reported feeling extremely stressed, which was notably higher than heterosexual respondents (26.7%) (Statistics Canada, 2014). Unfortunately, LBGTQ2SIA+ post-secondary students have to manage regular student stress with added minority stress (e.g., sexual identity concealment, expectations of rejections, discrimination), leading to more mental health challenges than non-LGBTQ2SIA+ individuals (Meyer, 2003).

Black students attending predominantly White post-secondary institutions face race-related stressors such as heightened awareness of negative stereotypes about Black people, unintentional racial insults (or microinsults), and intentional blatant discrimination (Griffith et al., 2019). Black students have been found to experience a combination of general life stress, race-related stress, and acculturative stress (i.e., stress related to ethnic minority) on top of the typical stressors for students, causing a cumulative stress experience unique to minority students (Abdullah & Brown, 2012; Mays et al., 2007; Pittman et al., 2019; Witbrodt et al., 2014). These stressors have been linked to negative behavioural and health outcomes, including psychological distress (Pieterse & Carter, 2007).

Historical trauma such as the mistreatment of Indigenous persons in Canada has caused ongoing intergenerational effects, including negative effects on the psychological well-being of Indigenous communities (Kirmayer et al., 2014). Children and grandchildren of Indigenous people who attended Indian Residential Schools in Canada report higher rates of depressive symptoms, suicidal thoughts and attempts, abuse and neglect, and enhanced sensitivity to stressors (Bombay et al., 2011, 2014; Elias et al., 2012). Social determinants of health, such as poverty, unemployment, housing and food security, social exclusion, and discrimination also

play a large part in the mental health challenges experienced by Indigenous communities (Boksa et al., 2015). Unfortunately, Indigenous post-secondary students in Canada report higher prevalence of intentional self-injury, seriously considering or attempting suicide, and receiving a depression or anxiety diagnosis as compared to non-Indigenous students (Wo et al., 2020).

Finally, individuals living with a disability have their own set of mental health challenges, especially when the disability is mental health related. An estimated 2 million Canadians live with a mental health related disability, which is the most common type of disability among youth, followed by learning disabilities and pain-related disabilities (Statistics Canada, 2018a). Of Canadians living with a disability (15 years and over), 38% have two or three disabilities, and 33% have four or more (Statistics Canada, 2018a). When it comes to students, 48% of secondary students with disabilities have been found to experience some type of mental health challenge (Poppen et al., 2016), and young adults with disabilities and mental health concerns are less likely to even pursue post-secondary training (Clark et al., 2008; Newman et al., 2011).

As the NS population includes a variety of marginalized populations, each experiencing unique stressors, it is imperative that mental health research in the province considers marginalized populations and intersectionality, especially as it relates to student health in times of crisis.

2.2.2 Student Health in Times of Crisis

As the COVID-19 pandemic forced Canadian universities to transition to online, remote delivery during the Winter 2020 semester, the impacts on students were significant. A Statistics Canada survey with more than 100,000 student participants found that 57% of respondents

experienced a significant disruption in their courses and/or academic work placements (Statistics Canada, 2020). In addition, 26% reported having their course postponed or cancelled by their institution, and 17% said they would not be able to complete their degree, diploma, or certificate (Statistics Canada, 2020). NS postsecondary institutions have transitioned to online learning since this time and, as of the Summer 2021 semester, education continues to be predominantly online. Other concerns were employment and finances as many job opportunities were no longer available (Statistics Canada, 2020). While the COVID-19 pandemic brought on many mental health concerns for the general population, students faced a unique scenario where they had to balance COVID-19 pandemic-related stressors alongside regular student stressors. Therefore, it is important to note how a pandemic can impact student health, specifically mental health, in a variety of ways, including their ability to cope. In addition, despite the variety of mental health resources and services provided by post-secondary institutions, students do not seek help from these services (Hintz et al., 2015) and stigma continues to be a large deterrent for seeking mental health services (Chew-Graham et al., 2003; Dyrbye et al., 2015; Schwenk et al., 2010; Tjia et al., 2005). As students were scarcely accessing mental health services prior to the COVID-19 pandemic, it is more important now than ever to explore alternative and innovative ways to deliver mental health services to students.

2.3 COPING

Perceived stress has been shown to be moderated, in part, by healthy coping (Al-Sowygh, 2013; Carver & Connor-Smith, 2010; Toker & Biron, 2012). It is important to acknowledge that it is not just an individual's experience of perceived stress that influences their health, but also their coping resources and strategies (Gottlieb, 1997; Lazarus, 1999; Mana et al., 2021; Taylor &

Stanton, 2007; Zeidner & Endler, 1996). Coping has been widely studied in relation to health and well-being across various populations (e.g., Norris et al., 2017; Razurel et al., 2013; Sirriyeh et al., 2010). Contemporary coping literature can largely be traced back to Lazarus' (1966) theory of coping where and individual's cognitive appraisal of a situation shapes their emotional response to both the person-environment relationship and how the person will cope with the appraised relationship. This iterative stress appraisal process can be described in three steps: (1) primary appraisal, the process of perceiving the threat; (2) secondary appraisal, bringing to mind a potential response; and (3) coping, executing the response (Lazarus, 1966). Coping is a process and takes place when a situation or condition is appraised by an individual as being personally significant, and as taxing or exceeding that individual's resources for coping (Lazarus & Folkman, 1984). A variety of measurement tools have focused on coping, including the Ways of Coping (Folkman & Lazarus, 1980), the COPE (Carver et al., 1989), the Coping Response's Inventory (Moos, 1993), the Coping Strategy Indicator (Amirkhan, 1990), and the Coping Inventory for Stress Situations (Endler & Parker, 1990). However, these measurement tools vary as coping can be categorized in a variety of ways.

One of the earliest nomenclatures distinguished two major theory-based functions of coping: problem-focused coping and emotion-focused coping (Folkman & Lazarus, 1980). *Problem-focused coping* involves addressing the problem that is causing distress, while *emotion-focused coping* involves addressing the negative emotions associated with the problem (Folkman & Lazarus, 1980). Billings and Moos (1981) suggested further categorization: within problem-focused coping there are active cognitive and active behavioural coping, and within emotion-focused coping there is avoidance coping. Active cognitive coping is described as attempting to address the problem using cognitive strategies such as attempting to see the positive side of the

situation or considering solutions (Billings & Moos, 1981). Active behavioural coping is described as attempting to address the problem through behaviours such as talking with a friend or seeking information about the situation (Billings & Moos, 1981). Avoidance coping is described as keeping busy in order to avoid thinking about the problem (Billings & Moos, 1981). This categorization allowed for more specific articulation of coping strategies and how they address stressors. Another theoretically driven categorization of coping is *meaning-focused coping,* where cognitive strategies are used to manage the situation's meaning (Park & Folkman, 1997).

Empirically derived categories include the three aforementioned theoretically driven categories (problem-focused, emotion-focused, and meaning-focused) while also including social coping (Zautra et al., 1996). These were also renamed as the following categories with associated descriptors and examples: Active (active, restraint, planning), Avoidance (denial, disengagement), Support (seeking instrumental support, seeking emotional support), and Positive Cognitive Restructuring (positive reinterpretation, humor, acceptance) (Zautra et al., 1996). As these empirically derived categories are largely similar to the three main theoretically driven approaches to coping (problem-focused, emotion-focused, and meaning-focused), coping researchers have largely maintained using the theoretically driven categories (Folkman & Moskowitz, 2004).

2.3.1 Coping Effectiveness

The importance of coping lies in its ability to effectively promote emotional well-being and address the problem that is causing distress (Folkman & Moskowitz, 2004). Coping effectiveness remains one of the most perplexing issues in coping research (Somerfield &

McCrae, 2000). Certain types of coping approaches are not inherently good or bad (Lazarus & Folkman, 1984), and their effectiveness is dependent on factors such as the context itself as what will be considered effective coping in one situation may not be effective in another, or at a later time (Folkman & Moskowitz, 2004). For example, in preparing for an exam, problem-focused coping such as studying for the exam is effective prior to the exam, while emotion-focused coping is effective when awaiting results (Folkman & Lazarus, 1985). Ultimately, effectiveness of coping can be determined through its ability to address an intended outcome and reach goals, such as conflict resolution, decreased physiological and biochemical reactions, decreased psychological distress, normal social functioning, return to pre-stress activities, well-being of self and others affected by the situation, maintaining positive self-esteem, and perceived effectiveness (Zeidner & Saklofske, 1996). Some of these goals can be addressed through momentary coping (e.g., biochemical reactions) while others are addressed through coping over time (e.g., normal social functioning, return to prestress activities), therefore making the distinction between short- and long-term outcomes (Folkman & Moskowitz, 2004). It is important to note that a coping approach may be effective for one goal but negatively affecting another (Folkman, 1992; Zeidner & Saklofske, 1996). For example, a physician may cope by accepting responsibility for a mistake and make changes to their practice (problem-focused), but may also experience more emotional distress by having to accept the fact that they made a mistake (Wu et al., 1991). This resembles the theoretical notion of "goodness of fit," where the appraisal of controllability calls for certain types of coping, in which situations appraised as controllable call for problem-focused coping, while low controllability calls for more emotion-focused coping (Conway & Terry, 1992; Folkman, 1984; Zeidner & Saklofske, 1996). It is

expected that people who choose coping strategies that "fit" the controllability appraisal will have better outcomes (Folkman & Moskowitz, 2004).

2.3.2 Coping & Resilience

Coping plays an important role in building resilience as positive coping skills have been shown to decrease symptoms of psychological distress and promote adaption in the face of adversity (Smith & Carlson, 1997; Thompson et al., 2016). As mentioned earlier, *resilience* is defined as an individual's ability to positively adapt when facing adversity, trauma, or stress (Masten, 2001). Resilience is not a static characteristic as it can be learned or developed, and it is dependent on personal and social factors (Thompson et al., 2016).

Resilience among students has been positively associated with positive coping mechanisms, such as seeking social supports (Howe et al., 2012) or problem solving (Haglund et al., 2009). A study with medical students found that those using approach-oriented (similar to problem-focused) coping strategies (e.g., exercise, contact therapist or counselor, talk to or spend time with friends, seek support from church, study more) were less likely to experience burnout, and are therefore suggested to be more resilient, than those using avoidant-oriented (similar to emotion-focused) coping strategies (e.g., smoking, physical self-harm, eat less than usual, excessive alcohol use, using recreational drugs, leave the city) (Thompson et al., 2016). It is important to note that this study applied *approach-oriented coping* (stressor being directly confronted) and *avoidant-oriented coping* (stressor being avoided) as coping nomenclature, rather than problem-focused and emotion-focused coping (Thompson et al., 2016). This study demonstrates a potential relationship between different approaches to coping and resilience,

although causation could not be determined as researchers used a correlational design (Thompson et al., 2016).

Because resilience is connected to coping methods, it is important to understand how students' coping methods will be impacted by the COVID-19 pandemic as it has already been suggested that this pandemic will significantly impact regular coping methods (Horesh & Brown, 2020). As there is less controllability with the effects of a global pandemic, have students relied more on emotion-focused coping as suggested by the theoretical notion of "goodness of fit"? Or have they perceived a level of controllability in their health behaviours (e.g., hand washing, proper nutrition, regular exercise) and opted for problem-focused coping through these behaviours? Although a variety of strategies and skills may allow for problem-focused and emotion-focused coping, leisure as a form of coping has been connected to increased resilience (Joudrey & Wallace, 2009; Mausbach et al., 2012) but has yet to be examined in the context of coping with a pandemic. For example, have students used leisure to distract themselves from pandemic stressors (emotion-focused coping) or have they consciously used leisure as an active way to control their own mental health (problem-focused coping)?

2.4 Leisure Coping

It is important to note that psychosocial factors and lifestyle (which includes a person's leisure) impact an individual's response to stress (Ewart, 1991; Iso-Ahola, 1994; Sobel, 1995). Although leisure has been defined a variety of ways (e.g., as time, as an activity, as a state of mind), this study will use the following leisure definition: enjoyable activities participated in during one's free time (Kleiber, 1999), representing a Western view of the concept of leisure. Leisure has long been hypothesized to be a positive coping resource, and more recently has been

shown to help enhance physical and psychological well-being, as well as improve performance and create a sense of meaningfulness (Caldwell, 2005; Elkington, 2011). But what is the connection between leisure, stress, and health?

2.4.1 The Leisure-Stress-Health Relationship

The leisure-stress-health relationship has been a topic of interest within leisure literature. An early theoretical model includes the Life Stress Paradigm, suggesting that psychosocial resources enable a person to cope with stressors (Ensel & Lin, 1991). This paradigm suggests that leisure may play an intervening or deterring role in the stress-health relationship (Ensel & Lin, 1991). With time and empirical research came more specific models. For example, the Leisure and Health Model suggests that leisure-generated self-determination (ability to make choices) and social supports generated through leisure are two key dimensions of leisure coping that play moderating roles between stress and health, also described as a "buffer" against the negative impacts of stress on health (Figure 1) (Coleman & Iso-Ahola, 1993). Beliefs of self-determination are suggested to provide stress-buffering effects regardless of the level of stress-crisis (Coleman & Iso-Ahola, 1993). Perceived social support generated through leisure is believed to help in crisis but be of little benefit when there are minimal stressors, while companionship appears to play an important role regardless of the number of stressors (Coleman & Iso-Ahola, 1993). However, it is recognized that leisure generated social supports may also be a stressor in itself, such as stress experienced through interpersonal conflicts (Coleman & Iso-Ahola, 1993). Maintained health is suggested to lead to more leisure, in turn leading to continued maintenance of health (Coleman & Iso-Ahola, 1993). In contrast, without leisure, increased life

stress is not buffered, leading to worsening of physical and mental health, causing more negative life events and more life stress (Coleman & Iso-Ahola, 1993).

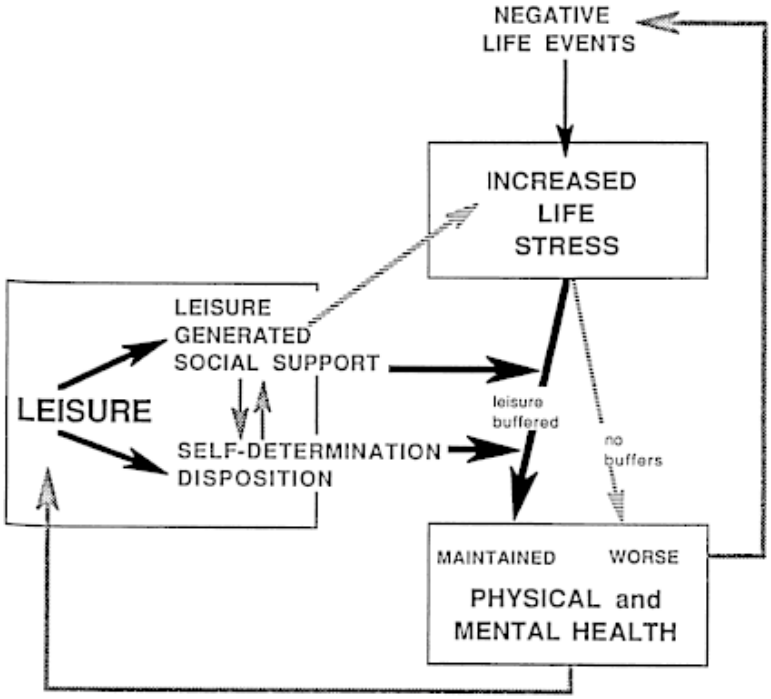

Figure 1 Theoretical model of leisure as a buffer by Coleman & Iso-Ahola (1993)

This original theoretical model has been supported by a one-year prospective study providing evidence for stress-buffer or stress-counteracting effects of leisure coping (Iwasaki, 2006). However, a recent empirical study with students that analyzed the leisure-stress-health relationship differently found that participating in leisure reduces stress, which in turn is associated with improved health behaviours, making stress the mediator in the leisure-health relationship (Kim & Brown, 2018). As the literature presents multiple potential relationships, the current study aimed to examine the potential moderating impact of leisure coping beliefs and strategies between mental health challenges (perceived stress and feelings of anxiety) and resilience.

2.4.2 The Hierarchical Dimensions of Leisure-Stress Coping Model

As a form of coping, leisure can provide individuals opportunities to take a break from a stressful problem or event in order to feel refreshed and ready to problem-solve, or provide an opportunity for mood enhancement, aligning with emotion-focused coping. Due to the variety of ways in which leisure can be connected to coping, Iwasaki and Mannell (2000) conceptualized the *Hierarchical Dimensions of Leisure Stress Coping*, a model demonstrating how leisure coping beliefs and leisure coping strategies are two major roles leisure may play in helping people cope with stress (Figure 2).

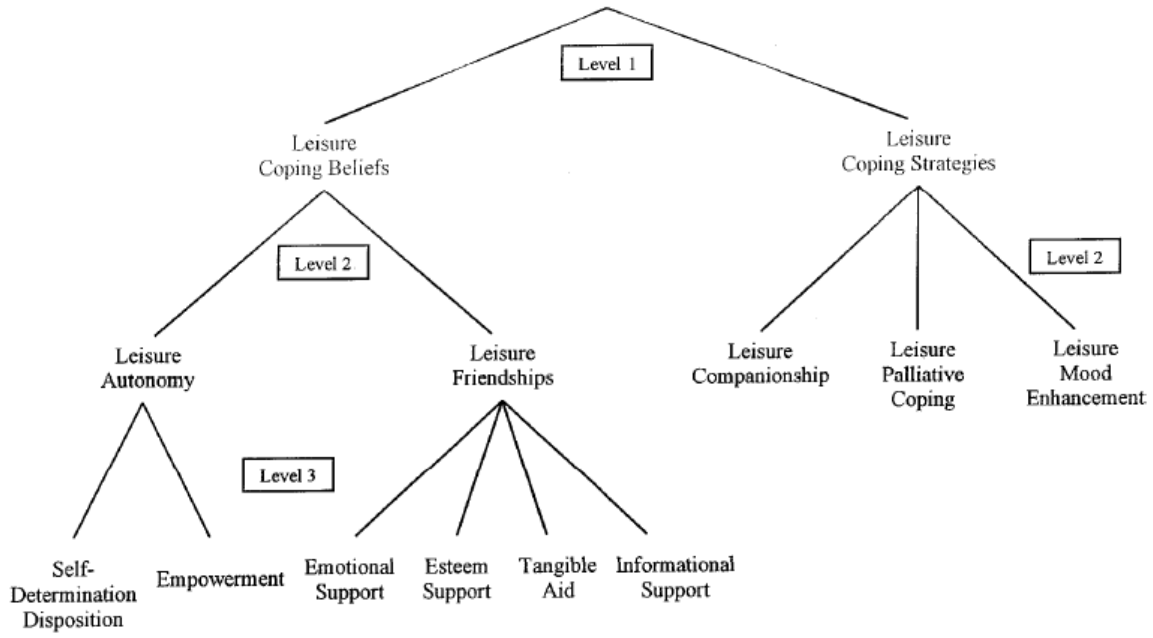

Figure 2 Hierarchical Dimensions of Leisure Stress Coping by Iwasaki & Mannell (2000)

Coping literature has long debated if coping is rooted in fixed dispositional coping styles or flexible situation-specific behavioural and cognitive responses to stressors (Endler et al., 1993;

Lazarus, 1993). In this model, *leisure coping beliefs* are described as an individual's general beliefs regarding how leisure helps them cope with stress (Iwasaki & Mannell, 2000). These beliefs are said to develop slowly over a long period of time, but overall seem to hold relatively stable psychological positions, representing fixed dispositional coping styles (Iwasaki & Mannell, 2000). In comparison, *leisure coping strategies* are the actual behaviours or cognitions offered through leisure involvement, providing stress-coping and often based on the specific situation (Iwasaki & Mannell, 2000). In this case, these strategies represent the more flexible situation-specific coping approach (Iwasaki & Mannell, 2000). Leisure coping reflects the stress appraisal concept mentioned earlier as an individual appraises the stressful event, determines a potential coping mechanism based on the stress (based on leisure coping beliefs), and then partakes in coping (using leisure coping strategies) (Iwasaki & Mannell, 2000). In certain situations, situational or contextual factors may influence the choice of coping strategies more so than the individual's leisure coping beliefs (Iwasaki & Mannell, 2000).

The subdimensions of leisure coping beliefs include *leisure autonomy and leisure friendship*. *Leisure autonomy* represents the belief that leisure can develop personality characteristics that allow people to cope with stress, such as self-determination and empowerment. As mentioned earlier, self-determination refers to a person's belief that leisure is freely chosen and under their control, which may play a moderating or buffering role between stress and health (Coleman & Iso-Ahola, 1993). In this case, leisure empowerment represents the extent to which an individual believes they are entitled to leisure and their beliefs regarding how leisure provides them with opportunity for self-expression and to develop a valued sense of self (Freysinger & Flannery, 1992; Henderson & Dialeschki, 1991; Samdahl & Kleiber, 1989; Shaw, 1994). *Leisure friendship* represents one's belief that people's friendships can provide them with

social supports (Iso-Ahola & Park, 1996) such as emotional support, esteem support, tangible aid, and informational support.

The subdimensions of leisure coping strategies include *leisure companionship, leisure palliative coping, and leisure mood enhancement*. *Leisure companionship* represents shared experiences as a form of social support (Iso-Ahola & Park, 1996). The difference between leisure friendship (as part of leisure coping beliefs) and leisure companionship (part of leisure coping strategies) is the perceived social support versus the actual physical social support, respectively. *Leisure palliative coping* represents a distancing/disengagement coping strategy where, in order to keep busy and distracted, an individual will temporarily disengage from the stressful event through leisure to then return later feeling refreshed and better prepared to handle the stress (Caldwell & Smith, 1995; Driver et al., 1991; Iso-Ahola & Crowley, 1991; Mannell & Kleiber, 1997; Patterson & Carpenter, 1994; Sharp & Mannell, 1996; Weissinger & Bandalos, 1995). *Leisure mood enhancement* is the final leisure coping strategy which represents the potential for leisure to enhance positive mood, reduce negative mood, and help with reducing stress in these ways (Iwasaki & Mannell, 2000).

In an attempt to measure the roles of leisure coping, Iwasaki and Mannell (2000) developed measurement scales to assess leisure coping beliefs and strategies to determine if these differing roles of leisure can be effectively predicted. The Leisure Coping Belief Scale (LCBS) is a dispositional coping measure assessing a person's stable beliefs about leisure as a form of coping with stress (Iwasaki & Mannell, 2000). The LCBS addresses self-determination, empowerment, emotional support, esteem support, tangible aid, and information support, representing the leisure coping beliefs mentioned above. The Leisure Coping Strategy Scale (LCSS) is a situation-specific coping measure to determine how leisure can specifically help a

person cope with stress (Iwasaki & Mannell, 2000). The LCSS addresses leisure companionship, leisure palliative coping, and leisure mood enhancement, representing the leisure coping strategies mentioned earlier. What is left to determine is the effectiveness of leisure coping.

2.4.3 Leisure and Immediate Adaptational Outcomes

A distinction has been made between immediate adaptational outcomes and distal adaptational outcomes of stress and coping (Zeidner & Saklofske, 1996). Immediate adaptational outcomes represent the extent to which people (1) feel their coping strategies are effective (perceived coping effectiveness), (2) are satisfied with coping outcomes (perceived coping satisfaction), and (3) perceived their stress levels to have decreased (perceived stress reduction) (Aldwin & Revenson, 1987; Folkman et al., 1986; Zautra & Wrabetz, 1991). In other words, immediate adaptational outcomes are the extent to which the individual perceives their coping to be immediately effective. In comparison, distal adaptational outcomes represent more long-term outcomes, including health indicators for physical and mental health (Lazarus, 1991; Menaghan, 1982; Taylor, 1986). When referring back to the Hierarchical Dimensions of Leisure Stress Coping model, leisure coping beliefs represent enduring personality dispositions, and is theorized to have less of a direct effect on immediate adaptational outcomes (Iwasaki, 2003). In contrast, leisure coping strategies, which represent situation-specific coping behaviours and cognitions, are theorized to have a direct effect on immediate adaptational outcomes (Iwasaki, 2003). However, it is possible that leisure coping beliefs indirectly influence adaptational outcomes via leisure coping strategies (Iwasaki, 2003). A study by Iwasaki (2003) tested different theoretically grounded models of leisure and coping, and found that, although stressors negatively influence immediate adaptational outcomes and health, leisure coping beliefs and

strategies both help facilitate positive immediate adaptational outcomes, which then subsequently has a positive impact on health regardless of presence or level of stressors experienced. More specifically, individuals with higher leisure coping beliefs tended to actually use leisure as a way of coping, and therefore use leisure coping strategies which then facilitated immediate adaptational outcomes (Iwasaki, 2003). Since results suggest that leisure provides immediate adaptational outcomes regardless of the presence or level of stressors, Iwasaki (2003) suggested that leisure is beneficial not only when individuals are experiencing minor stressors, but also when experiencing high stress levels. As the COVID-19 pandemic and its associated stressors (e.g., media, quarantine) could be considered highly stressful, this current study expected to find the use of leisure coping among post-secondary students in response to the pandemic, and for this leisure coping to be perceived as effective in regards to immediate adaptational outcomes.

2.4.4 Leisure in Times of Crisis

As noted above, leisure plays an important role in health, especially in times of high stress levels. In fact, research in Ireland during the COVID-19 pandemic found that many leisure activities were positively associated with positive affect, including exercising, walking, gardening, and pursuing hobbies (Lades et al., 2020). Unfortunately, leisure participation can be impacted or changed during times of crisis, such as the SARS pandemic where individuals avoided crowded areas and opted for outdoor recreation in less crowded areas (Marafa & Tung, 2004). A study specifically exploring changes in discretionary time activities among Chinese college students found that, while some found no change in their activities, others simply opted for different activities available to them (Yang et al., 2011). This was suggested to demonstrate

how constraints, such as those imposed during the SARS pandemic, can also bring forth different possibilities for action (Yang et al., 2011). During a pandemic such as COVID-19, it is imperative that people find ways to connect to, and participate in, leisure. Garmin, a technology company specializing in wearable health trackers, collected data regarding how activities have changed during the COVID-19 pandemic to see how the pandemic may have influenced people's physical activity (Barwacz, 2020). Certain activities have shown large decreases, such as skiing/snowboarding (down 96%, potentially due to resorts closing), lap swimming (down 88%), indoor/treadmill running (down 44%, potentially due to gyms closing), and golf (down 20% in second half of March, 2020) (Barwacz, 2020). In comparison, some activities increased such as virtual cycling (up 64%), walking (up 36%), and yoga (up 11%) (Barwacz, 2020). With these results, the company is suggesting that people are still exercising, but are finding ways to do it from home, with or without their own equipment (Barwacz, 2020). Although leisure encompasses much more than simply fitness activities, these statistics demonstrate that people who participated in fitness leisure activities prior to the pandemic are finding other ways to continue their participation. This pattern of increasing fitness activities in order to improve health and avoid being infected by a virus was also noted in the earlier mentioned study (Yang et al., 2011).

As the COVID-19 pandemic has changed the dynamics of social relationships, the American Psychological Association has recommended creating a sense of normalcy and maintaining social networks to help alleviate anxiety (American Psychological Association, 2020). As many individuals are confined to their homes, this can be done through connecting via video chat programs, e-mail, or messaging through smartphone applications (Wiederhold, 2020). This demonstrates not only the use of technology for virtual fitness, but also for connecting

individuals and maintaining social relationships. Technology presents an important avenue for connecting individuals to leisure, especially during the COVID-19 pandemic. As some popular online leisure activities during the COVID-19 pandemic include virtual museum tours, virtual concerts, and video streaming, this study will focus on the use of smartphones for leisure during these times.

2.5 SMARTPHONES

A common suggestion among researchers studying smartphones (or mobile phones more broadly) and mental health is that the use of mobile phone technology leads to poor mental health (Beranuy et al., 2009; Murdock, 2013; Park et al., 2010; Pierce, 2009; Reid & Reid, 2007; Sánchez-Martínez & Otero, 2009; Thomée et al., 2010; Thomée et al., 2011). However, these correlational studies cannot assume that mobile phone technology causes poor mental health. It is possible that individuals who experience mental distress, anxiety, or stress use their mobile phones as a form of disengagement or a way to connect with social networks (Al-Kandari & Al-Sejari, 2020; Bae, 2019; Deatherage et al., 2014; Grellhesl & Punyanunt-Carter, 2012; Nehra et al., 2012; Panova & Lleras, 2016). This has been found in a study of motivations for Internet use, where the findings suggested that individuals experiencing lower stress may go online for fun or excitement, and individuals experiencing higher stress may go online for stress relief (Deatherage et al., 2014). This study suggested that it may not be the use of the Internet that is causing the stress, but potentially the stress that is motivating users to go on the Internet (Deatherage et al., 2014). Similarly, the use of mobile phones to avoid boredom has been shown to not cause negative mental health outcomes, and therefore suggests that the mere use of mobile phones does not necessarily increase stress or anxiety (Panova & Lleras, 2016). In fact, a study

with Indian university students found that 43% of participants used their mobile phone as a way to “escape problems” (representing emotion-focused coping), and 70% of participants said their mobile phone helps them overcome feelings of inferiority, helplessness, guilt, anxiety, depression, and more (Nehra et al., 2012). Another study found that the most common reason for texting was relaxation/escape (Grellhesl & Punyanunt-Carter, 2012). All these studies demonstrate that students may use their mobile phones as a coping strategy.

A study by Panova and Lleras (2016) was the first to observe mobile phone usage and coping in a structured experimental environment to determine if people find emotional relief in their use of mobile phones. These researchers wanted to determine if having access to a mobile phone during anxiety-provoking stressful situations and during a waiting period immediately following the stressful event increases the individual’s short-term resilience to stress and anxiety (Panova & Lleras, 2016). Results found that students who were allowed to keep their phones nearby during a stressful event had lower anxiety immediately after the stressful event compared to students without their phones, providing evidence that mobile phones can have a “security blanket effect” by increasing people’s resilience to stressful events (Panova & Lleras, 2016, p.253). They also found that the majority of people (82%) with increased anxiety after the stressful event used their phones the entire waiting period without having been instructed to do so (Panova & Lleras, 2016). Results also showed that students (without access to their phone) who were given the option to play on a computer during the wait time were less likely to take this distraction than students who had the opportunity to use their phones, suggesting a unique comforting effect related to mobile phones as compared to other technology (Panova & Lleras, 2016). This study provides a foundation for understanding the relationship between mobile phones and coping among recent generations of university students. This study is supported by

other research which have demonstrated that people often reach for their mobile phones when experiencing discomfort or stress, potentially for distraction or reaching out to others (Chiu, 2014; Murdock, 2013). However, these studies were missing one important piece of information: What are people doing on their mobile phones that seem to help with coping?

2.5.1 Smartphones & Leisure

In regards to leisure, the use of smartphones has been associated with increased leisure time among individuals who may use their phones to access and/or experience leisure, such as posting on social media sites or socializing and connecting with others (Janković et al., 2016). Some researchers have argued that smartphone use caused *leisure distress*, meaning negatively impacting leisure participation (Lepp et al., 2013, 2015), but these studies were not considering smartphone-related leisure within their definition of leisure. These same researchers also analyzed personality traits when analyzing leisure distress among participants and found that extroverts with low levels of smartphone use have significantly more positive leisure experiences (Lepp et al., 2015). However, this may be due to extrovert personality traits, not their reduced phone use. Introverts may simply prefer phone-related leisure, which was not measured in this study, but was found true in a different study (Leung, 2015). Participants with higher levels of smartphone use (10+ hours a day) experienced more distress during leisure (non-phone leisure), explained by their preference for using their phones (Lepp et al., 2015). As these results do not take into account phone-related leisure, further research is required in this area. Specifically, there is a need to determine how smartphone-based leisure (i.e., leisure experienced through a smartphone such as playing games, viewing videos, social media platforms, engaging in apps for fun, connecting socially with others) can potentially be used as a form of coping, and to

understand the use of smartphones through lived experiences in addition to quantitative data, as was explored through this study. This gap in the literature is also due to the ever-changing nature of technology and the relationship people have to technology. As generational differences have been found regarding the individual's relationship with technology (Hauk et al., 2018), there is constantly a need to re-evaluate the relationship individuals may have with their phone, including its role in leisure participation.

2.5.2 Smartphone Addiction and Smartphone Relationships

The term *addiction*, although previously used only within the context of substance use, has also been applied to gambling, Internet use, gaming, and mobile-phone usage (Kim, 2006). As the term addiction commonly implies the presence of specific characteristics (tolerance, withdrawal symptoms, and dependence), some choose to use the term *maladaptive use* instead. Research has found that maladaptive mobile phone use and smartphone addiction has been strongly associated with poor mental health among students (Beranuy et al., 2009; Murdock, 2013; Park et al., 2010; Pierce, 2009; Reid & Reid, 2007; Sánchez-Martínez & Otero, 2009; Thomée et al., 2010; Thomée et al., 2011). However, it is important to note that not all smartphone use is maladaptive, excessive, or problematic, and that reasonable (i.e., not excessive) levels of use can lead to many positive outcomes and benefits for users such as positive outcomes related to social relationships (Al-Kandari & Al-Sejari, 2020), social capital and subjective well-being (Bae, 2019), positive effects on student life satisfaction (Kil et al., 2021), and a negative association with mental health problems (Kil et al., 2021). Because smartphones can provide some benefits to users, some users consider their smartphone to be a "digital companion", therefore suggesting the development of a relationship with one's

smartphone (Carolus et al., 2019, p.918). In fact, previous research has not only suggested the possibility of building relationships with technology (Carolus et al., 2019; Nass et al., 1996), but that these relationships can resemble those between humans in regards to trust (Madhavan & Wiegmann, 2007), social rules (Sundar & Nass, 2000), social bonds (Cassell & Bickmore, 2000; Nass et al., 1999), and their ambivalent nature (being both positive and negative at the same time; Uchino et al., 2004). Therefore, when considering the use of one's smartphone for leisure, coping, or other uses, the relationship between the user and their smartphone, which will be termed *smartphone relationship* throughout this research, should be considered as it contextualizes not only one's personal feelings towards their smartphone, but also its possible uses.

2.5.3 Smartphones & COVID-19

Although traditional media, such as news coverage, is standard for emergency management communication, strategic social media use (e.g., hashtags) has been suggested as another effective way for agencies to communicate accurate health information to the general public in times of crisis (Lachlan et al., 2016). In fact, new media such as Apple updates, Twitter, and Instagram are less likely to contain graphic images (and have now implemented warning labels) that may worsen mental health impacts of pandemic-related media (Jones et al., 2016), and it is suggested that these types of media may be some of the best ways to provide information to the public (Garfin et al., 2020). However, it is important to note the increased possibility of misinformation which can also heighten perceived risk and fear related to health (Ng et al., 2018; Wang et al., 2019). So, in addition to being a potential tool for leisure and coping, could smartphones also play a role in the impacts of the COVID-19 pandemic?

2.6 GAPS

As the pandemic continues to impact people's lives, the breadth of impacts on mental health, specifically among post-secondary students in Canada, is not fully understood and this timely research has been suggested in order to inform health practice and policy (Horesh & Brown, 2020). Coping mechanisms among post-secondary students have been discussed, but there is still work to be done to determine the true role of smartphones as a coping tool. Further, the leisure aspects related to smartphone use among students presents a potential explanation for why students turn to their phones when experiencing perceived stress or other mental health challenges such as feelings of anxiety. Finally, the role of smartphone relationships and how it relates to smartphone use and leisure coping is also unclear. By bridging these different topics together, this study aimed to not only discover how smartphones are being used as a form of leisure coping among students, but how smartphone uses, and relationships may have been impacted by the COVID-19 pandemic.

CHAPTER 3 METHODS

3.1 Research Purpose & Questions

The purpose of this study was to determine the role smartphones play as a form of leisure coping among post-secondary students, and how this may have been impacted by the COVID-19 pandemic. The current study aimed to answer the following main research question: *What is the relationship between smartphone use as a form of leisure coping, mental health, and resilience among post-secondary students, and has it been changed by the COVID-19 pandemic?* The following are sub-questions and their associated hypotheses:

1. *Is there a relationship between an individual's demographics and their leisure coping, mental health, and/or resilience?*

   $H_0$1: There will not be a significant relationship between demographic information (age, gender, marginalized populations, and area of study) and leisure coping, mental health, and/or resilience.

   H1: There will be a significant relationship between demographic information (age, gender, marginalized populations, and area of study) and leisure coping, mental health, and/or resilience.

2. *Is there a moderating relationship between mental health, leisure coping, and resilience?*

   $H_0$2: The relationship between mental health challenges and resilience will not be moderated by leisure coping.

   H2: The relationship between mental health challenges and resilience will be moderated by leisure coping.

3. *Are post-secondary students using smartphones as a form of coping, and do they perceive this to have been changed by the COVID-19 pandemic?*

4. *How are post-secondary students using their phones and do they perceive this to have been changed due to the COVID-19 pandemic? (qualitative)*
5. *How do students describe their relationship with their smartphone and do they perceive this to have been changed due to the COVID-19 pandemic? (qualitative)*

3.2 PARTICIPANTS

Participants for this study were students attending a post-secondary institution within Nova Scotia, Canada, but did not have to physically be located in Nova Scotia at the time of participation. Inclusion criteria included the following: participants must (1) have been a student at a Nova Scotia post-secondary institution (part-time or full-time) during the Fall 2019 (September-December, 2019) and Winter 2020 (January-April, 2020) semesters, (2) be enrolled (part-time or full-time) at a Nova Scotia post-secondary institution at the time of participation, and (3) own a smartphone. Participants were selected through convenience sampling as the researcher is situated in Halifax, Nova Scotia, Canada. Also, snowball sampling was also used to reach a wider range of students across the province.

3.3 PROCEDURE

3.3.1 Ethics

This study received ethics clearance from research ethics boards from five Nova Scotia post-secondary institutions: Dalhousie University, Acadia University, Saint Mary's University, Cape Breton University, and Mount Saint Vincent University. Ethics approval was required for each university where recruitment materials would be shared through the school's various administrations.

3.3.2 Recruitment

Based on a power analysis, the target sample size for a medium effect size and power of .95 was 119. Recruitment took place between September 13th and December 31st, 2020, although all participants completed the survey before October 30th, 2020. Participants were recruitment through mainly virtual advertising. Administrative staff, academic advising, student health and wellness services, as well as targeted organizations/groups of various marginalized populations from post-secondary institutions across Nova Scotia were contacted to advertise through newsletters and email blasts to current students (see Appendices A and B for recruitment materials). Preliminary results were shared with groups who assisted in recruitment, as well as participants who identified wanting to receive these preliminary results. Advertising through social media (Facebook, Twitter, Instagram, LinkedIn) was done through the researcher's social media accounts as well as reaching out to post-secondary institutions' social media accounts to advertise where possible. Recruitment materials included an explicit invitation for potential participants who identify as part of a marginalized community. All interested participants who met inclusion criteria were included in the study, with no maximum participant number.

3.3.3 Data collection

As the pandemic led many students to learn from home, with the possibility of students moving to different provinces or countries during this time, this research chose a survey for data collection. This allowed for the potential of a large participant pool while also providing flexibility for participation as the survey could be started any time and be completed later if needed. Finally, a survey provided participants with the opportunity to submit their answers

anonymously, allowing for more comfort when discussing difficult topics such as mental health. Surveys have their limitations when it comes to rigour (e.g., honesty of answers) and potential depth of answers.

Through recruitment materials, potential participants were provided a link to an Opinio survey. The survey was delivered through Opinio, a Dalhousie University hosted and supported tool used for online surveys. Data collected through Opinio gets stored on Dalhousie University servers and therefore adheres to various sections of privacy legislation, and the Dalhousie Policy for the Protection of Personal Information from Access Outside Canada (Dalhousie University, 2007). The survey began with a consent form (see Appendix C) and participants were informed that by starting the survey, this would serve as consenting to participate. Participants completed this one-time survey (approx. 10-30 min, depending on details of answers given) that was accessed through a computer or mobile device (see Appendix D). As negative emotions could have been elicited through the survey through topics of mental health and the COVID-19 pandemic, mental health resources relevant to post-secondary students in Nova Scotia were provided throughout and at the end of the survey.

Individuals were informed that any information submitted through the survey could not be removed from analysis due to the anonymity of answers. However, participants had the option to not answer questions or leave the survey at any point in time.

In regard to remuneration, participants were given a link to a separate Opinio survey (Appendix E) at the end of the study survey where they could enter their email address to be entered to win one of three $50 electronic gift cards to a local business (in Nova Scotia) of their choice. This separate remuneration survey ensured that the study survey data remained anonymous and separate from personal identifying information. The remuneration draw took

place on January 30th, 2021, and winning participants were contacted through the email provided in the remuneration survey.

3.4 Measures

The study survey included both quantitative and qualitative data collection. Quantitative data collection through the use of scales is quite common within coping literature and has the ability to determine relationships between important concepts through statistical analysis. However, qualitative data collection provides the in-depth explanations or lived experiences that are not always captured through quantitative data. As the use of smartphones and leisure can be very personal and unique to the individual, a mixed-method approach provided a more complete picture to inform data analysis.

Demographic questions included age, gender, housing, education, and a question regarding marginalized populations. Age and marginalized populations have been discussed above as potentially having differences in coping and stress. Gender differences have been found regarding mental health (Mahmoud et al., 2012) and coping approaches (Garnefski et al., 2004; Hänninen & Aro, 1996; Stanton et al., 1994; Vingerhoets & Van Heck, 1990).

3.4.1 Phone Use Information

Participants were asked about their phone use both retrospectively regarding prior to the COVID-19 pandemic, and at the time of study participation. This was to determine not only the prevalence of use, but to help gain an understanding of how phone use may have changed due to the pandemic, and what people are doing on their phones. Several questions asked the approximate amount of daily screen time and approximate amount of time spent on different

activities that require the use of their phone. Participants were also asked to describe, in their own words, their relationship with their phone and if they perceived it to have been impacted or changed by the pandemic. Although not directly related to leisure-related smartphone use, this information was gathered to help contextualize the phone use information as individual use may be due to use for work, school, leisure, and/or other reasons. These contextual uses may help explain a person's patterns of use and their relationship with their smartphone.

3.4.2 Stressors & Causes of Anxiety Symptoms

Participants were asked about stressors and what may have caused feelings of anxiety both prior to the pandemic and at the time of study participation. These open-ended questions were meant to provide context regarding reasons for coping. As students experienced a variety of student-related stressors in addition to daily hassles and COVID-19 pandemic-related stressors, it was important to determine what the participants identified as the top stressors and causes of anxiety symptoms in both time periods.

3.4.3 Leisure Coping

As there is no gold standard for measuring coping (Folkman & Moskowitz, 2004), the choice of quantitative coping measures is dependent on the type of coping being explored. Momentary accounts may reduce recall error, but does not address the complexity of coping over time (Folkman & Moskowitz, 2004). Retrospective accounts address this complexity, however can include recall error, varying recall periods, and the change in meaning assigned to coping strategies due to hindsight (Coyne & Gottlieb, 1996; Folkman & Moskowitz, 2004; Porter & Stone, 1996). However, it has also been suggested that retrospective accounts may be better

predictors for future outcomes than momentary assessments (Stone et al., 1998). As this study was taking place after the COVID-19 pandemic has already started, retrospective accounts were used when asking students about their leisure-based coping, immediate adaptational outcomes, stressors, and phone use information from prior to the start of the pandemic. Momentary accounts were used for asking students about these same concepts (leisure coping, immediate adaptational outcomes, stressors, and phone use information) along with mental health measures for perceived stress, anxiety, and resilience.

To measure leisure coping, the Leisure Coping Beliefs Scale Short-Form (LBCS-SF) and Leisure Coping Strategies Scale Short-Form (LCSS-SF) by Iwasaki and Mannell (2000) were adapted. The LCBS-SF is a 12-item dispositional measure of leisure stress-coping, and the LCSS-SF is a 9-item situation-specific measure of leisure coping. Both short-forms of these scales have high Cronbach's alpha reliability coefficients (LCBS-SF = .91, LCSS-SF = .93) (Iwasaki, 2006). As a pre-amble to these scales, participants were reminded to think back to times before the COVID-19 pandemic or in the current moment (at time of study participation), as well as to focus on leisure related to their phones. This may be the use of the phone itself, or leisure experienced or accessed through their phones. Therefore, results from these scales will represent smartphone-based (SB) leisure coping, and these scales will henceforth be referred to as SB-LCBS-SF and SB-LCSS-SF.

3.4.4 Immediate Adaptational Outcomes (IAO)

As this study aimed to determine the individual's perceived leisure coping effectiveness, three questions were created based on the immediate adaptational outcomes measurement tool by Iwasaki (2003). This original tool includes measures of: (a) coping effectiveness; (b) coping

satisfaction; and (c) stress reduction. This tool was based on Folkman et al.'s (1986) measure of coping outcomes, Zautra and Wrabetz's (1991) measure of coping efficacy, and measures of perceived coping effectiveness (Aldwin & Revenson, 1987; Beehr & McGrath, 1996). Psychometric properties have been explored, including support for the internal structure of the construct using confirmatory factor analysis, and an alpha reliability score of .89 for the scale was reported (Iwasaki, 2001). As the measurement tool could not be accessed, three questions were developed to represent the three measures of the original tool, with the same Likert scale.

3.4.5 Smartphone Addiction Section

As the prevalence of smartphone use can differ between individuals, some students may report much higher usage than others. *Smartphone addiction*, as described earlier, can impact an individual across six factors: (1) daily-life disturbances, (2) positive anticipation, (3) withdrawal, (4) cyberspace-oriented relationship, (5) overuse, and (6) tolerance (Kwon et al., 2013). These factors of smartphone addiction were provided in the survey, and participants were asked to reflect on their relationship with their phone and describe their experience of these smartphone addiction characteristics. Although this section of the study survey did not yield quantitative results, these questions were included in the survey as they could provide more information regarding smartphone relationships. As this section could also elicit some comments regarding this topic, an open comment section was also provided to allow students to discuss any thoughts they have regarding this topic.

3.4.6 Perceived Stress Scale (PSS)

The Perceived Stress Scale (PSS) is a self-assessment for measuring perceived stress, and was originally developed in 1983 (Cohen et al., 1983). The original version of this scale was developed in English and included 14 items (PSS-14), with 7 positive items and 7 negative items rated on a 5-point Likert scale. In 1988, the PSS was shorted to 10 items (PSS-10) using factor analysis, and is now the most commonly used version (Cohen & Williamson, 1988). The PSS-10 was found superior to the PSS-14 (Lee, 2012) and was therefore used in this study and henceforth referred to as the PSS. A study looked at the psychometric evidence for this scale from various other studies and results showed that the PSS has acceptable psychometric properties (internal consistency reliability, test-retest reliability, factorial validity, criterion validity) (Lee, 2012). In this study, perceived stress was measured for the month leading up to participation in the survey.

3.4.7 Generalized Anxiety Disorder 7-item (GAD-7) scale

The GAD-7 is a self-administered scale measuring anxiety and asks participants to rate how they have been bothered over the last 2 weeks by the list of problems (7-items) on a scale of "not at all" to "nearly every day" (Spitzer et al., 2006). It should be noted that this scale is not used to diagnose individuals with generalized anxiety disorder as further evaluation would be required to do so (Spitzer et al., 2006). Therefore, in this study, this scale was used to measure commonly experienced symptoms of anxiety and their frequency (e.g., how often a person experienced these symptoms). This scale has shown good reliability as well as criterion, construct, factorial, and procedural validity (Spitzer et al., 2006). The GAD-7 was chosen not only for its psychometric properties, but also as it is a self-administered test. The GAD-7 is also

short (only 7 items) and therefore did not add too much length to the surveys provided to participants. In this study, anxiety was measured for the two weeks leading up to participation in the survey.

3.4.8 Brief Resilience Scale (BRS)

The BRS was created to specifically measure resilience as the ability to bounce back from stress (Smith et al., 2008). Resilience-related constructs of the scale were based on the Connor-Davidson Resilience Scale (Connor & Davidson, 2003) and the Ego Resilience Scale (Block & Kremen, 1996). The BRS is a 6-item scale, and although is quite short, a methodological review of resilience measurement scales has identified the BRS to be a highly valid and reliable measure of resilience (Windle et al., 2011).

3.5 Qualitative Methodology

Qualitative approaches in coping research are helpful in understanding specifics that may not be addressed in quantitative measures (Folkman & Moskowitz, 2004). These allow for researchers to better understand what the person experienced, their emotions through this experience, and their thoughts as the situation unfolded (Folkman & Moskowitz, 2004). Also, qualitative approaches allow for uncovering coping strategies or mechanisms that would not be identified through inventories or measurement tools (Folkman & Moskowitz, 2004). Studies have found that quantitative and qualitative measures for exploring coping may overlap, but are not equivalent (Gottlieb & Gignac, 1996; Moskowitz & Wrubel, 2000), presenting the importance of having both quantitative and qualitative measures to gain a more comprehensive understanding of coping.

3.5.1 Philosophical Perspective & Methodological Approach

Following a pragmatic approach, this study took a post-positivist worldview, which has been suggested to be a common worldview within leisure research as researchers believe in the importance of subjective reality without wanting to abandon the tenets of conventional positivism (Henderson, 2011). Stewart and Floyd (2004) have also suggested the need for post-positivism in leisure research to better represent people's lived experiences. As individuals may have unique experiences in relation to leisure, smartphones, and coping, this worldview still supports the notion that knowledge is socially constructed (Henderson, 2011). One characteristic of post-positivism is that it brings together theory and practice (Ryan, 2006), and also legitimizes the use of mixed methods (Henderson, 2011).

A qualitative description approach was used in this study to analyze qualitative data within the survey. A qualitative description approach is most relevant when researchers want information directly from those experiencing the phenomenon of interest (Neergaard et al., 2009). In this case, post-secondary students were asked about their personal experiences with stress, leisure coping, and the use of their smartphones. The priority of qualitative description research is to gain in-depth understanding of the phenomenon by putting the emphasis on literal descriptions provided by participants, with the second priority being the interpretation of meaning participants place on their experiences (Sandelowski, 2010). This methodological approach accepts that multiple realities exist, such as those experienced by students before and after the pandemic and yields studies where subjective interpretations are supported and strengthened by quoting participants verbatim (Bradshaw et al., 2017). As open-ended questions allowed participants to explain their experiences, these descriptions were used verbatim during

analysis to decrease bias from the researcher. Since little is known regarding the use of smartphones for leisure coping among students, this methodology was ideal as qualitative description provides the opportunity to better understand an unknown or little-known phenomenon, offering a unique opportunity to gain inside knowledge of participants' experiences (Bradshaw et al., 2017).

3.5.2 Reflexivity

Prior to data collection and analysis, the researcher reflected on her positionality and how gender, race, sexual orientation, values, and beliefs may have impacted the research process. This could have impacted the creation of the survey, the recruitment materials, and the language used throughout the study. Although the researcher did not have any face-to-face contact with participants, the researcher also acknowledged that participants may have viewed the researcher's social position as privileged or as having power within the participant-researcher relationship. As a leisure scholar who values leisure and incorporates it as part of a holistic view of health, the researcher also took into consideration her own values and beliefs regarding leisure. Memoing and reflexive note taking was used throughout the research process, allowing the researcher to acknowledge her own interpretation biases.

3.5.3 Researcher Positionality

In qualitative research, it is important for the researcher to share their positionality, including disciplinary connection, what lead to the research question, and their assumption regarding the research question (Bradshaw et al., 2017). In this case, the researcher is a Certified Therapeutic Recreation Specialist (CTRS) who has spent 8+ years as a post-secondary student,

having experienced many of the same stressors described earlier, including the effects of the COVID-19 pandemic on students. The researcher understands the importance of leisure for mental and overall health, and describes her own smartphone use as leisure coping. This proposal was inspired by the lack of acknowledgement in the literature that smartphones may play a role in leisure and leisure coping as smartphones can often be associated with negative outcomes on health. Also, leisure and health information currently being shared through post-secondary institutions are not capitalizing on the potential use of smartphones to reach students. The researcher acknowledges that their positionality as a white, able-bodied, formally educated, mid-socio-economic class, heterosexual, cis-gendered woman may have biased her interpretations. However, the use of a qualitative descriptive approach aimed to minimize the researcher's interpretation bias.

3.6 RIGOUR

Within qualitative methodology, rigour is made up of four principles: credibility, dependability, confirmability, and transferability (Lincoln & Guba, 1985). In this study, credibility was addressed through researcher memoing and using previously validated measures. Dependability was established through documentation of reasoning supporting the study's methods including determination of recruitment methods, data collection, and methodology. Transferability was addressed through the rich descriptions provided by the participants and by attempting to recruit a heterogenous sample. Confirmability was addressed through debriefing with research supervisors regarding the appropriateness, consistency, and completeness of the analysis and interpretation.

Several steps were taken to ensure the rigour of quantitative results. Although there is little literature related to quantitative rigour, suggestions have been made regarding the explicit consideration of sampling, sample size, instrumentation, data collection methods, and data analysis (Laher, 2016). For this study, steps were taken to ensure rigour of statistical analysis, instrumentation, and acknowledgement of methodology. For statistical analysis, peer-review was completed by a faculty member at Dalhousie University experienced in statistical analysis (Dr. Neyedli). Statistical assumptions were tested to determine if parametric or non-parametric tests should be used. Finally, in terms of testing the possible moderating relationship described above, models were determined prior to statistical analysis to ensure the researcher did not test all possible models until reaching statistical significance, and instead focused on the models of interest. For instrumentation, reliable and valid scales were used, as described above. In terms of methodology, limitations of survey methodology were acknowledged and considered during analysis, such as the possible impact of recall on quantitative results.

3.7 Data Management

Data collected through Opinio was stored on Dalhousie University servers and therefore adhered to various sections of privacy legislation, and the Dalhousie Policy for the Protection of Personal Information from Access Outside Canada (Dalhousie University, 2007). Throughout the data collection period and when data collection was complete, copies of survey results were downloaded on a weekly basis and saved in password protected files on a password protected computer, which was only accessed by the researcher and co-supervisors. Data will be kept safely for up to five years for potential secondary analysis and will be permanently deleted after this time.

3.8 ANALYSIS

3.8.1 Statistical Analysis

After surpassing the target sample size, data collection ended when there was a long period of time without new respondents. Once data collection was complete, data was cleaned by removing data from participant submissions that were empty or incomplete. A submission was included in the analysis when a participant answered the first fourteen questions of the survey because questions 14 ("Do you perceive your relationship with your smartphone to have changed due to COVID-19?") was the first question following the demographics which included information that could be included in the analysis and answer the research question. Although some participants did not complete the survey, any responses provided up until leaving the survey was saved and included in the analysis. Therefore, where percentages were used, valid percentages were calculated according to the number of participants who answered the question.

Statistical analysis was completed using SPSS v.25. Descriptive statistics (e.g., counts, means, standard deviations) described demographic data and scores on the SB-LCBS-SF, SB-LCSS-SF, IAO questions, PSS, GAD-7, and BRS scales. Sub-question 1 and hypothesis H1 was tested through correlational statistics, *t*-tests, and chi-squared tests to determine any relationships between demographic information (age, gender, marginalized populations, and are of study) and results from the scales. Sub-question 2 and hypothesis H2 was explored through model building and moderation analysis using the PROCESS macro for SPSS, version 3.5.3 by Andrew F. Hayes to determine if leisure coping beliefs and strategies (measured through SB-LCBS-SF or SB-LBSS-SF) played a moderating role between mental health challenges (measured through PSS and GAD-7) and resilience (measured through BRS). Settings for this moderation analysis

were model 1 for moderation, maximum likelihood as the estimation method, bootstrapping, and a 95% confidence interval. Sub-question 3 was addressed directly through questions 34 and 56 on the survey (Appendix D) where students identified if they considered their past smartphone use as coping and if they felt it was impacted by the pandemic. Other exploratory statistical analysis was also completed using *t*-tests and chi-squared tests to determine any relationships between leisure coping scales and other quantitative measures. Significance for all statistical tests was set at $p \leq .05$.

Finally, quantitative questions related to time spent on smartphones were not included in the analysis due to incomplete, incorrect, or unclear answers. Potentially due to the wording of questions, participants accidently answered these questions differently from each other rather than by identifying total number of hours per day spent on each phone use. For example, when asked how much time (in hours) in an average day they spend on their smartphone, they responded with a number larger than 24. Another participant answered subsequent questions with fractions of their original total hours instead of providing the total number of hours for each phone use. Due to the possibility of having multiple inconsistencies in the data, statistical analysis was not completed for these questions.

3.8.2 Content Analysis

Sub-questions 4 and 5 were addressed through qualitative data in the survey. All qualitative data from the survey was uploaded into NVivo 12 PRO to undergo content analysis. Content analysis is used within qualitative description as there is a relatively low level of interpretation (Vaismoradi et al., 2013). Similar to thematic analysis, content analysis aims to break text into relatively smaller units of content and describing these units (Sparker, 2005). In

addition, since little is known about these topics and their relationships to each other, content analysis is ideal for simply reporting commonalities and exploring topics (Green & Thorogood, 2004), which is well-suited for qualitative description. In content analysis, a deductive approach can be used to inform categories and testing a previous theory in a different situation (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005). However, it is important to remember that although a theory or framework may drive original analysis, there is not necessarily a commitment to stay within the theory or framework as analysis continues (Sandelowski, 2010), therefore allowing for a more iterative process.

Content analysis was completed following three phases: (1) Preparation, which includes immersion in the data to obtain a sense of the whole and selecting the unit of analysis; (2) Organizing, which includes open coding and creating categories by grouping codes into categories and sub-categories; and (3) Reporting, which is the reporting of results through models, conceptual systems, conceptual maps or categories, and providing a story line (Elo & Kyngäs, 2008). Original creation of themes was informed by literature (e.g., leisure coping beliefs and strategies), but continued to develop and be informed by literature and survey data (quantitative and qualitative). With the help of co-supervisors, the researcher developed an initial codebook prior to coding. Co-supervisors provided suggested revisions, and a final codebook was created (Appendix F). The researcher initially coded all qualitative results and the researcher's co-supervisors reviewed coding to confirm the acceptability of codes, while also providing direction and suggestions. Then, the researcher coded the rest of the data and provided co-supervisors with the final fully coded documents. During the analysis of qualitative data, it was noted that examples provided in some survey questions included terminology such as "positive" and "negative". Many participants chose to identify their smartphone use and

smartphone relationships using these terms and were therefore used to categorize the analysis. When this distinction was not provided, to continue categorizing, comments were classified either by the words used or the context of the remainder of the comment. It should be noted that this priming of answers is also discussed in the limitations of this study. Table 1 demonstrates how comment context and specific terms were categorized.

Table 1 Qualitative Analysis Categorization

Category	**Positive**	**Negative**
Words used to classify qualitative comments into these categories	Comments describing: - Simplification of life - Connection to loved ones - Improved mental health - Providing more opportunity for preferred leisure Specific words: - "positive" - "good thing" - "helps me" or "helpful" - "appreciated" - "like"	Comments describing: - Worsening or negatively impacting mental health - Use of smartphone as wasting time that could be used doing something else - Providing less opportunity/taking away opportunity for preferred leisure Specific words: - "negative" - "stupid" - "isn't the best" - "downside" - "dislike" or "do not like" - "disease" - "feel obligated" - "hate" - "bad habit" - "disappointed"

3.8.3 Memoing

Memoing, as described earlier, was used in order for the researcher to reflect upon how qualitative and quantitative results and their analyses contextualize each other. During statistical analysis, the researcher kept a document with all statistical analyses and their outputs, including their main takeaways. For content analysis, the researcher kept notes in a notebook including similar categories that emerged from student accounts and how they might contextualize quantitative results. The researcher also discussed with colleagues and supervisors to ensure categorizations were not purely based upon the researcher's biases and understandings. Memoing impacted data analysis mainly by directing the creation or modification of codes and categories within content analysis and the conceptualization of the discussion.

CHAPTER 4 RESULTS

A total of 299 post-secondary students started the survey, while 222 reached and answered question 14 ("Do you perceive your relationship with your smartphone to have changed due to the COVID-19 pandemic?"). This is the first question in the survey that directly relates to one of the research questions, and therefore was used to determine which responses would be included in the analysis. Therefore, there are 222 participants included in the analysis, although attrition was present throughout the survey, with 166 completing the entire survey.

The majority of participants were women (74.8%), between the ages of 21-25 (47.3%), White (61.7%), living in Nova Scotia (86.0%), and living with two or more people (55.0%). In terms of school-related demographics, participants were all students of Nova Scotia post-secondary institutions, with the majority attending Dalhousie University (59.5%), were full-time students (90.5%), and were in an undergraduate program (50.5%) across a variety of programs. Table 2 has the complete set of demographic frequencies and valid percentages according to the number of students who answered each demographic question. This table demonstrates the demographics of participants who answered at least question 14 ("all 222") and those who completed the entire survey ("final 166").

Table 2 Demographics

Demographic Categories	Frequency (all 222)	Valid Percentage*	Frequency (final 166)	Valid Percentage* (final 166)
Age				
18-20	57	25.7	41	24.7
21-25	105	47.3	78	47.0
26-30	42	18.9	31	18.7
31+	18	8.1	16	9.6
Gender				
Men	54	24.3	42	25.3

Women	166	74.8	123	74.1
Non-binary	2	0.9	1	0.6
LGBTQ2SIA+	38	18.2	27	17.3
Race				
Black	12	5.7	8	5.1
Latinx	3	1.4	3	1.9
Asian	50	23.9	34	21.8
Indigenous	5	2.4	2	1.3
White	129	61.7	83	53.2
Other	10	4.8	8	5.1
Disability status				
Living with a disability (not related to mental illness)	10	4.8	7	4.5
Diagnosed with mental illness (not receiving treatment)	17	8.1	13	8.3
Diagnosed with mental illness (and receiving treatment)	28	13.4	20	12.8
Location				
Nova Scotia	191	86.0	144	86.7
Elsewhere in Canada	20	9.0	16	9.6
Another country	11	5.0	6	3.6
Living Situation				
Alone	29	13.1	23	13.9
With one other person	71	32.0	55	33.1
With two or more people	122	55.0	88	53.0
Post-Secondary Institution				
Acadia University	20	9.0	15	9.0
Cape Breton University	64	28.8	38	22.9
Dalhousie University	132	59.5	110	66.3
Saint Mary's University	1	0.5	1	0.6
University of King's College	4	1.8	2	1.2
Not on the list	1	0.5	0	-
Student				
Full-time	201	90.5	151	91.0
Part-time	21	9.5	15	9.0
School Level				
Diploma/certificate program	25	11.3	17	10.2
Undergraduate	112	50.5	83	50.0
Graduate	74	33.3	58	34.9
Other description**	11	5.0	8	4.8
Program of Study				
Architecture and Planning	19	8.6	11	6.6
Arts and Social Sciences	23	10.4	17	10.2
Business	19	8.6	12	7.2
Education	3	1.4	3	1.8
Engineering	11	5.0	7	4.2

Environmental Studies	10	4.5	7	4.2
Health	54	24.3	44	26.5
Law	16	7.2	14	8.4
Management	4	1.8	2	1.2
Science	51	23.0	41	24.7
Not part of this list***	12	5.4	8	4.8

*Valid percentage = percentage of participants who answered the question
**Other description provided by participants: professional program
***Answers provided by participants: communications, community development, economics, history of science and technology, international development studies, marine management, supply chain management, and sustainability.

Also, in order to understand this study's participants, the following table (Table 3) depicts results of the PSS and GAD-7.

Table 3 Mental Health Scales (PSS and GAD-7) Results

Perceived Stress Scale (PSS) Results* - Mean score = 21.02				
Score category	Score 0-10	Score 11-20	Score 21-30	Score 31-40
Frequency (%)	8 (4.7%)	77 (45.6%)	68 (40.2%)	16 (9.5%)
Generalized Anxiety Disorder (GAD-7) Scale Results** - Mean score = 9.24				
Score category	Score 0-4: minimal anxiety	Score 5-9: mild anxiety	Score 10-14: moderate anxiety	Score 15-21: severe anxiety
Frequency (%)	44 (26.0%)	50 (29.6%)	42 (24.9%)	33 (19.5%)

Note: PSS had 10 questions and was measured using a 5-point scale format (0 = Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, 4 = Very Often) with four reversed scoring questions (4, 5, 7, and 8). The GAD-7 had 7 questions and was measured using a 4-point scale format (0 = Not at all, 1 = Several days, 2 = More than half the days, 3 = Nearly every day).
*Categories presented for the PSS results are not based on previously identified categories.
**Categories presented for the GAD-7 results are informed by the original scale scoring.

4.1 Is there a relationship between an individual's demographics and their leisure coping, mental health, and/or resilience? (Research Question 1)

Age (measured as continuous variable) was found to have a weak negative relationship with SB-LCSS-SF[1] scores [$r(172) = -.163$, $p = .032$]. There were relationships approaching to significance between age and SB-LCBS-SF[2] scores [$r(174) = -.131$, $p = .084$] and between age and post-COVID IAO[3] [$r(170) = -.148$, $p = 0.053$]. There was no significant relationship between participant age and pre-COVID IAO ($p = .230$), PSS[4] ($p = .286$), GAD-7[5] ($p = .116$), of BRS ($p = .770$) scores. Through logistic regression, it was determined that age was not a predictor of using one's smartphone for coping (binary variable, "yes" or "no"; $p = .941$).

Gender was not found to have a significant impact on scores in SB-LCBS-SF ($p = .390$), SB-LCSS-SF ($p = .179$), pre-COVID IAO ($p = .241$), post-COVID IAO ($p = .996$), PSS ($p = .137$), GAD-7 ($p = .717$), or BRS ($p = .340$). Also, there was no significant difference in odds of using one's smartphone for coping between men and women ($p = .214$). There were not enough participants identifying as non-binary to complete statistical analyses.

Racialized participants (i.e., not White) had significantly higher SB-LCBS-SF scores ($M = 58.33$, $SD = 14.74$) than non-racialized participants ($M = 50.53$, $SD = 12.73$), $t(164) = -3.55$, $p = .001$. Racialized participants also had significantly higher SB-LCSS-SF scores ($M = 44.48$, $SD = 10.72$) than non-racialized participants ($M = 38.80$, $SD = 9.47$), $t(162) = -3.48$, $p = .001$. Racialized participants also had significantly higher pre-COVID IAO ($M = 9.16$, $SD = 3.37$) and post-COVID IAO ($M = 9.41$, $SD = 3.63$) scores than non-racialized participants (pre-COVID M

[1] SB-LCSS-SF: Smartphone-Based Leisure Coping Strategies Scale Short-Form
[2] SB-LCBS-SF: Smartphone-Based Leisure Coping Beliefs Scale Short-Form
[3] IAO: Immediate adaptational outcomes
[4] PSS: Perceived Stress Scale
[5] GAD-7: Generalized Anxiety Disorder 7 Scale

= 7.15, *SD* = 2.99 and post-COVID *M* = 6.98, *SD* = 3.27), *t*(160) = -3.89, *p* < .001 and *t*(160) = -4.33, *p* < .001, respectively. There was no significant difference between racialized and non-racialized participants across PSS (*p* = .540), GAD-7 (*p* = .151), or BRS scores (*p* = .915). Racialized individuals were no more likely to use their smartphone for coping than non-racialized participants (*p* = .512).

Participants who identified **living with a disability** (e.g., physical, cognitive, developmental) or a mental illness had significantly higher GAD-7 scores (*M* = 13.22, *SD* = 5.58) than participants without a disability (*M* = 8.17, *SD* = 5.40), *t*(157) = -4.897, *p* < .001. This was also true for perceived stress where participants living with a disability had significantly higher PSS scores (*M* = 26.03, *SD* = 5.21) than participants without a disability (*M* = 19.68, *SD* = 6.36), *t*(157) = 5.47, *p* < .001. BRS scores were significantly lower for individuals living with a disability (*M* = 15.67, *SD* = 4.49) than individuals not living with a disability (*M* = 20.13, *SD* = 4.33), *t*(154) = 5.37, *p* < .0001. There were no other significant differences between participants with and without a disability for SB-LCBS-SF (*p* = .966), SB-LCSS-SF (*p* = .553), or pre- and post-COVID IAO (*p* = .922 and *p* = .810, respectively). There was a significant association between the participants' disability status and whether they used their smartphone for coping, $\chi^2(2, N = 209) = 6.58$, *p* = .037. Based on the odds ratio, the odds of identifying the use of their smartphone for coping were 2.95 times higher if they reported having a disability.

LGBTQ2SIA+ participants had significantly higher GAD-7 scores (*M* = 12.41, *SD* = 6.07) than participants who did not identify as LGBTQ2SIA+ (*M* = 8.68, *SD* = 5.59), *t*(157) = -3.11, *p* = .002. Similar results were found for perceived stress, where LGBTQ2SIA+ participants had significantly higher PSS scores (*M* = 24.30, *SD* = 6.18) than participants who did not identify as LGBTQ2SIA+ (*M* = 20.47, *SD* = 6.59), *t*(157) = 2.78, *p* = .006. There was no

significant difference between these two groups for scores in SB-LCBS-SF (p = .328), SB-LCSS-SF (p = .752), pre- and post-COVID IAO (p = .373 and p = .551, respectively), or BRS (p = .315). LGBTQ2SIA+ participants were no more likely to use their smartphone for coping compared to non-LGBTQ2SIA+ participants (p = .298).

The first null hypothesis for this research question was stated as "there will not be a significant relationship between demographic information (age, gender, marginalized populations, and area of study) and coping, mental health, and/or resilience". As there are some significant relationships between participant demographics and scores related to coping, mental health, and resilience, the null hypothesis is rejected, though the alternative hypothesis is only partially supported.

4.2 What are students' smartphone use and smartphone relationships and how have they been changed by the COVID-19 pandemic? (Research Questions 4 and 5)

4.2.1 Generally Mixed Relationships

An individual's relationship with their smartphone can be quite complex as many participants described mixed relationships with their smartphone. For example, one participant states, "I think the relationship is positive, as it hosts so many purposes, but negative undertones as I rely on it so much." While these mixed relationships were common, the complexity of these relationships were often due to individual contexts, such as the following participant's need to connect with others while simultaneously considering their smartphone use a "waste of time":

> *I feel like I rely on my smart phone quite heavily. It is always in my hand or pocket. I live away from my hometown and it is how I stay connected to my family and friends. In that sense it is positive. However it can be a crutch when I procrastinate which turns into a*

waste of my time. I think that is the pitfall of having a smartphone; it's a useful tool but also addictive. In this sense it is negative as I find myself almost on autopilot reaching and opening my phone and scrolling through Instagram.

Participants' relationships with their smartphones were often described in relation to their need or **reliance** on this technology. Participants often described their smartphone as "something I cannot live without", with one participant explaining the impact this has had, stating "I cannot stay without my phone for too long. I constantly find myself going back to it; to check notifications, update social media feed, etc." Some **reasons for this reliance** were provided, with one participant explaining that "While it is possible to get by without a smartphone, so much of my life is connected to it, that it makes it easier and therefore more difficult to give up" and another stating, "I can be without my phone, but it's uncomfortable. I use it to do almost everything, play music, browse the internet, read news, watch videos, message people." Smartphones were described as a necessity, as one participant explains, "It has its ups and downs. I can definitely be without it for periods of time (a few weeks or so) but I still view it as a necessity for my life." Another participant described noticing a general dependence on smartphones in society: "Generally speaking I think we all rely a little too heavily on smartphones for convenience sake (directions etc.) and spend too much time on social media." It seems smartphones have become so important in many participants' lives that it has become, as described by a participant, "inconvenient not to have it.

Participants' mixed relationships were also due to **mixed impacts on mental health**. For example, one participant explained how "Some days my phone can stress me out (getting messages or not getting messages and social media use), but some days it can make me feel

better (connecting with people)." These mixed impacts on mental health were also echoed by another participant describing impacts on connection and anxiety:

> *I'd say my smartphone has had both a positive and negative effect on my mental health. On the plus side, it has allowed me to engage with my friends, family, and community when I could not see them in person and helps me stay informed about a lot of things, such as traffic, weather, and emergency alerts, at all times. On the other hand, it's really easy to become addicted to your smartphone and get sucked into it which sometimes takes away from my productivity and tasks, leading to increased feelings and symptoms of anxiety for myself.*

As both positive and negative relationships could exist simultaneously, participants described having to **balance these relationships**. For example, one participant stated "If I spend too much time on my phone, I become more depressive, jealous, and unhappy. Without my phone at all, I can sometimes feel isolated. A happy balance of moderate/light phone usage is something I strive for." Another participant also expressed the importance of balance, saying this:

> *It's all about balance. Some days/weeks, I find that I use my smartphone as I should (i.e. a tool that helps me in life). But other days I spend too much time scrolling on social media which is not useful for my life and just makes me stressed/grumpy and then I usually get to bed late.*

These comments demonstrate how a smartphone relationship can be ambivalent and therefore be considered both positive and negative at the same time. Similar to comments in the literature, one participant also questioned the connection between mental health and smartphone

use: “I'm curious about the direction of that relationship: Am I feeling depressed because I'm spending more time on the phone, or am I spending time on the phone because I'm depressed?”

4.2.2 Smartphone Use Determines Smartphone Relationship

Since relationships with smartphones can be quite complex and individualized, this begs the following question: What determines one’s smartphone relationship? When asked to describe their relationship with their smartphone, many participants chose to do so by **describing their smartphone use and how it plays a role in the relationship**. For example, one participant described their relationship as “Neutral, sometimes I think I spend too much time on it or am too attached, other times I can go a day or two without needing it.” Another participant said,

> *I perceive my relationship with my smartphone to be neutral as I use my smartphone for a lot from using health apps, texting, social media, FaceTiming, calendar and alarm clock, I rely on my phone quite a bit to help me keep organized.*

Interestingly, one participant pointed this out as well, saying “[smartphone] use determines type of impact; if they are used wisely, they are good. If they are used more than our needs, they are bad for us.” This comment presents the importance of differentiating what would be considered use that would lead to positive relationships versus use leading to negative relationships.

4.2.3 Positive Use and Positive Relationships

As smartphone use can be varied, certain uses were highlighted as more positive than others. Many **positive** uses of smartphones were described, with one participant describing the importance of each app on their smartphone:

My relationship with my smartphone is mostly very positive. I find humour and support in social media (e.g. memes) and can share content with my friends, which helps me keep in touch with friends who are far away. I also use my phone to call and text my family in order to stay in touch with them. I use Netflix and other apps to watch movies and TV shows on my phone. I Google questions that I don't know the answers to, or educate myself in general by searching for information on topics that I'm interested in. I use Google Maps and other location apps to find places to go in real life (e.g. stores, restaurants) and to ensure that I don't get lost and am familiar with the way there. I use the transit app to plan my commute to school, friends, stores, etc. I use Facebook to keep up-to-date with events and news happening in my communities, and in my friends' lives. I also use social media to connect with classmates for projects.

Many of the positive uses related to using one's smartphone as a **tool**. Many students described how their smartphone was an **organization tool**. For example, one participant described,

My overall relationship is positive. I've come to rely on it quite a bit for making notes to myself, reminding myself about events and obligations via my calendar, keeping in touch with friends and family, taking pictures, and using the internet to look up information and check social media.

Smartphones were also described as a **tool for gathering information, including navigation**: "I can search for anything, help, if I need to find my way around, I will use google maps.". Some described this access to information to be "so very positive that I could not live without that aspect." Smartphones were often described as a **tool for communication**, whether through its original purpose of calling, or other forms such as texting, video chatting, and communicating

through online platforms (e.g., social media). For one participant, communication is an important aspect of their smartphone:

> *That being said, using my smartphone to connect and stay in contact with the people that are significant in my life via Facetime, Whatsapp and Facebook Messenger are positive elements of my smartphone. […] My phone is something that I can be without during the day but at least towards the end of my night, I would like to have access to connect and communicate with the people that I did not see during my day.*

The importance of smartphones as a communication tool was explained by one participant who said their smartphone "makes life more simple with my email and form of communication being right at my fingertips." Most importantly, using one's smartphone as a communication tool was an important component of staying connected with others, as one participant states "I use my phone to keep in touch with my family as we do not live in the same area and with my friends across the country."

Not surprisingly, the use of smartphones as a tool was described as leading to **positive relationships**. When asked to describe their relationship with their smartphone, one participant described "Positive because it allows me to connect with my partner, friends and family that I live far away from and because it can be a source if entertainment and leisure." One participant focused on the organization tool, explaining "It can be a positive because I can use it to help with my school work a lot", and another on the tool for accessing information, saying "[…] it is positive in the sense that I have access to so much information, a place to write notes, set reminders, etc." One participant described multiple uses related to their positive relationship, saying "I try to only use my phone for the important thing, like education, communication, and

navigation. This is a very positive experience." One participant explained how the use of their smartphone as a tool directly influences the relationship:

> *I hate not having my phone or being unable to check it because otherwise I constantly feel like I'm forgetting something (I probably am). Even just jotting a thought in the notes app can lift a significant mental weight because I don't have to worry about forgetting.*

Overall, it is important to recognize that, although some smartphones use can lead to negative relationships, some participants explicitly shared the important positive relationships they have built with their smartphone:

> *I think I have a pretty positive relationship with my smartphone. I use it for texting, Facebook Messenger, Instagram, surfing the web, exercise apps, and games (mostly crosswords and brain games). I do use my phone every night before bed to turn my brain off and help me fall asleep. I am reliant on it in this way. I find it VERY hard to fall asleep without my phone. But during the day I do not mind to be away from my phone.*

4.2.4 Negative Use and Negative Relationships

Participants also described some smartphone use as **negative** by explaining its relatively negative or minimal importance in **daily lives or activities**. For example, one negative form of smartphone use was the description of it being a waste of time, as described here by a participant, "[…] I do often find myself playing a stupid game, or scrolling on social media. This never makes me feel good, and just feels like a waste of time." Similarly, "mindless scrolling" was often used to describe the negative use of many apps, mainly social media: "Sometimes I find myself mindlessly scrolling through social media when I should be doing something else." These terms were often used to describe smartphone use – most often social media – as

"unproductive". The other negative smartphone use described was use that led to negative **impacts on mental health**, most often connected to social media. One participant explains this connection as follows, "[…] I also find myself wasting a lot of time on social media and can get caught up in it fairly easily which isn't the best for my time management or mental well being." Another participant explains the reasoning for this negative impact is due to social media being "very draining" and another explaining that spending too much time on social media "ultimately leaves me more stressed and overwhelmed." Although social media was often presented as a positive form of socialization, participants also noted how this form of socialization was "poor quality". Some described social media as negative smartphone use without any explanation, for example, "I tend to hop on social media more often than necessary though, which is a downside."

Not surprisingly, some participants described having **negative relationships** with their smartphone. These negative relationships stemmed from two main factors: social media and constant availability. **Social media** was identified above as a negative use of smartphones, and unsurprisingly was also identified as a factor in negative smartphone relationship. For example, one participant stated, "I really dislike social media and think it has a negative impact on my life, but my phone does encourage me to check it", and another saying, "The things I do not like about my smartphone might be my over dependence on it and a possible addiction to social media (if not addiction then certainly overuse)." Another participant focused on a specific social media platform, explaining that "Instagram is the main culprit for negative impacts - especially if I post something I feel the need to check how many likes I receive every few minutes." The negative relationship participants described with social media often stemmed from comparing themselves with others, which impacted their self-confidence or self-esteem. For example:

Social media tends to make me have lower self confidence due to the expected body image that celebrities have. Seeing the attention and positivity they receive is discouraging as I feel as though I would be seen as 'better' if my features were different. I feel as though I compare myself too much to others but try to gear my attention towards influencers who care about health and encouraging others.

Participants also provided other reasons for negative relationships stemming from social media, as one participant states, “Checking twitter or Facebook or Tumblr is a bit of a disease - I work to look at them less because they bum me out and also eat time that I could spend actually enjoying what I'm doing.”

The second most reported reason for negative relationships with their smartphone is the use related to **constant availability**, otherwise described as always being “on call”:

I enjoy the feeling of going somewhere without my phone, because I like the feeling of not being "on call" all the time. But sometimes I worry about missing out on things if I don't have my phone with me.

This feeling of constant availability was described by participants in different contexts. For example, it was described in the context of being **available to friends**: “If a friend messages at midnight, they can see if I've seen their message and I feel obligated to respond.” Another context was that of **being a student**: “Because the line of communication is always open it is difficult to disconnect from work/student life.” Most commonly described was the need to be available **as it relates to work**:

I hate society's demand for it as well. Many employers I've worked with over the past few years require a smartphone to clock into work, to receive and respond to emails after

duty hours, and to organize shifts. I wish I could be without it but doing so would handicap my ability to meet school and work demands.

Another participant described how this need to be available has led to a negative relationship, saying "Negative. […] my personal cell phone has morphed into my work phone, blurring the lines between the personal and business."

The **impact of constant availability** to others was highlighted as participants described a variety of negative outcomes. Many described the impact on their **mental health**: "I don't have too many worries about being away from my phone, except for anxieties over people needing to contact me"; "gives me stress when I just need a break and people keep blowing it up"; "However, as I'm on my phone and if someone texts me, I feel the need to respond right away, and the constant feeling of needing to talk to someone gives me more stress." Another outcome has been the development of **constantly checking** one's smartphone:

I am noticing more and more recently a 'pavlovian' response to my phone - checking it constantly for notifications even if it's not on do not disturb. I use Instagram and Tik Tok a lot for breaks from school and sometimes during class online, which is a bad habit.

This constant checking has led to its own negative impacts, as described by one participant:

I am constantly looking at it and therefore am constantly getting notifications and messaging. I can feel myself become more expectant of getting a notification when I look at my phone and be disappointed if no notification appears even if I am just looking at my phone in order to put on some music.

It seems negative relationships with smartphones could be created through smartphone use that was considered negative, according to participants. Participants described how these

negative relationships brought about many negative impacts on their lives, many of which related to feeling tied to their smartphone. One participant summarized it like this:

> *I hate the availability of social media, and the way you simply cannot get along without one if you want to participate in today's society (particularly at school). Life is so fast and it often seems that having a personal device is the only way to keep up. Additionally, the amount of discipline required to avoid the hollow gratification associated with constant strings of humour and information is difficult to maintain and overall I find it exhausting.*

Responses related to smartphone addiction did not add to the richness of responses related to smartphone use and smartphone relationships as many participants simply repeated concepts and perspectives shared earlier in the survey. Overall, smartphone use varied across participants, and so did their perceived positive or negative value. These results demonstrate assorted uses of smartphones as a tool for organization, information gathering, communication, and leisure coping, as well as a negative influence on daily activities and mental health.

4.2.5 Phone Relationships for Marginalized Populations

An interesting topic that was brought up by a small number of participants was how smartphone relationships may differ for marginalized populations. Although not discussed widely throughout the survey, it should be noted as these topics represent important smartphone uses that create different smartphone relationships for marginalized individuals. The first topic was that of how the access to social media and news platforms through smartphones allowed for **racialized participants** to view the traumatic images, videos, and stories related to the violent and racist events happening around the world. Although these racist events are not new, the

increased use of smartphones during the pandemic (as mentioned earlier) led many to readily see this content online. This topic was highlighted by one Black participant's comment as it related to questions of stress and anxiety in the survey:

> *I think it's important to remember that for many racialized persons the stress of COVID has largely been overshadowed by recent events and discussions of racism, so it is really hard to separate the two and attribute any stress/anxiety solely to the pandemic.*

The second topic, the concept of **safety**, was noted by both racialized participants and participants identifying as LGBTQ2SIA+. Comments were provided to explain that a smartphone can play an important role in the safety of the user. One of these comments directly related this sense of safety for an individual identifying as LGBTQ2SIA+:

> *For LGBT individuals a smartphone may be the only escape to a place they feel loved, accepted and safe. It may be the only way they ever hear their preferred name or pronouns. In these times a smartphone can be a lifeline for LGBT individuals.*

Two other comments were provided in terms of safety, and although more general, both were provided by marginalized individuals. One racialized participant stated,

> *My relationship with my phone is neutral. I don't think I need my phone, I can go all day without checking it but I don't like not having it with me at all when I'm not at home because I think it is unsafe to not have it.*

Finally, an LGBTQ2SIA+ participant said, "I feel anxious if I don't have my phone with me because I feel like it would be essential in an emergency situation to call for help, contact loved ones, etc." Although the concept of safety could be applied to all smartphone users, it is interesting that any comments related to safety were only provided by individuals from marginalized populations.

4.2.6 Strategies for Improving Smartphone Relationship

As many participants had varying or mixed relationships with their smartphones, many participants shared how they have taken steps towards improving their smartphone relationship. Participants described various strategies they have implemented, as can be seen in the following table (Table 4).

Table 4 Smartphone Strategies

Strategy	Quote Example
Change display settings	*I have put the functions on my phone to dim the blue light and use the dark mode when possible. I try really hard to put the phone away (min 30 mins) before bed because it affects my sleep.* *[…] putting black and white mode on it helps with senseless scrolling.*
Silencing notifications / Muting	*I do need breaks from my phone, so I tend to leave it on silent and will put it away or not touch it when it is charging so I am not being constantly bothered and alerted from outside noise that takes me away from the task or activity I am doing at the moment.* *It can be distracting at times, but I learned to mute my notifications when I'm studying or trying to focus and I try to limit my screen time. This has so far helped a lot.*
Digital detox	*Sometimes I get into a pattern of looking at my phone in the morning in bed or at night in bed and just scrolling through Facebook videos. I know that's not healthy and then sometimes I decide to go several days to a week without going on facebook as a "social media detox". And I always find that beneficial. So in general, my phone is a tool that I enjoy using, but sometimes I get a bit addicted and need to take a step away*

	If social media or other aspects of smartphones become overbearing or draining, people do "detoxes". For example, many of my friends have become overwhelmed with Instagram, or find it too distracting when at school, and either delete the app or temporarily disable their account in an "insta detox". This is a healthy break from the app, and it is entirely socially acceptable to do this with one or all of one's social media profiles.
Deleting/turning off specific apps	*I recently turned my school email app off my phone which has been a positive change.* *I think that's mainly because I stripped away apps that I associate with negativity (Instagram and facebook)*
Implementing limits (e.g., time limit, time of day, when doing other things)	*I have to put screen time limits on my apps so that I can't access them during the day.* *When I go to work I leave it away and when I workout I don't touch it either.* *Set timers for most apps so I don't go over a daily limit.* *I am very conscious of the negative impacts of too much screen time, and try to limit myself as much as I can, especially before bed.* *In terms of social media, I have learned and gained the skills to control and limit my use of social media for reasons other than connecting and sharing my insights with others. Specifically with Instagram, I have learned to not allow a lot of time on the app where that quality time can be invested in manners that are more important FOR ME.*
Mindful use	*Since then, I when I reach for my phone I try to ask my self why I want to use my phone right now and if there's anything else I could be doing instead that would be more*

	enjoyable or meaningful. It's really hard sometimes!
Using other technology	*I would like to be with out my phone but I would need to buy other things like iPod and an alarm clock and I never seem to get around to doing that.*

These strategies were implemented by participants for several reasons. One participant described wanting to make changes after viewing a documentary on the use of technology:

> *I'm more addicted than I would like, however I just watched The Social Dilemma and it gave me the push I needed to start distancing myself more. I've turned off notifications and deleted some social media apps, though I still browse others like Reddit and Instagram. I use my phone mainly for communication (text and phone), listening to music, playing games, and taking photos. I do rely on my phone a fair bit, but I can go without it for extended periods if I need/decide to (it is hard though).*

A common reason for the implementation of these strategies was to increase one's control over their smartphone, for example, "Smartphone is a good tool for leisure. We can get many positive effects from it if we use it in control." Another participant echoed this with their own experience:

> *This keeps me connected with the world and I don't forget that the control is in my hand. So, I never let my smartphone control me rather I control it. Because I believe the hidden meaning behind smartphone is not that just the phone is smart but the user has to be smart. Otherwise, in no time one can become it's slave! I use it wisely.*

As described by participants, smartphone relationships can be mixed and varied, but they are not stagnant. Smartphone relationships can be improved or worsened, depending on one's

use. Strategies can be implemented to improve these relationships, although these strategies are often in response to increased awareness or a need for more control.

4.2.7 COVID's Impact on Smartphone Use

It seems there were three main impacts of the COVID-19 pandemic on smartphone use: a change in use, an increase in use, and more purposeful use. Participants described a **change in use** as their use had not increased or decreased, but simply had been different than before:

> *After looking at my screen usage for my phone, I do not think it has increased since the Covid-19 pandemic. Rather than being on my phone more, I think that I am using my phone in different ways. Such as reading the news, communicate more with friends, and schoolwork.*

This change was often targeted towards COVID-19 pandemic-related impacts, as one participant describes "I am using my phone more now to check daily news, daily cases of covid and to study online now." Some participants changed their use as it relates to leisure, with one participant stating, "I think I use it more so now than before and use it less as a social tool and more for individual use/consumption" and another explaining "I only recently starting borrowing ebooks from the library on my phone. This has been a positive change."

A common impact of the COVID-19 pandemic on smartphone use was an **increase in use**, especially in response to being more isolated: "Used my phone more often during covid since there were less things to do, especially during self-isolation when you can't leave the house and socialize." As original use levels could differ among students, one participant described the extent of their increase, saying "During COVID I definitely spent way more time on my phone. Trying to connect with friends since I couldn't in person, trying to occupy my time. I'd spend

10+ hours a day on my phone." Not surprisingly, many participants reflected on this increased use, deeming it "unhealthy": "During the beginning months of the pandemic I was constantly on my phone to an unhealthy extent because I was home and bored." The two most commonly reported increased were uses related to communication and social media:

> *Yes, I am on it more. Especially when restrictions were worse and the only way to communicate was via a screen. I also found I started using social media A LOT more and spending way more time scrolling than I ever did before.*

Reasons for this increased use were often related to having more time - "I find that when COVID hit, I spent more time on my phone so much because I didn't have anything else to do." - or different environments:

> *I have been on social media on my phone way more often during the pandemic. Usually, I would only really check social media in the morning and evenings. But now that I'm working from home and it's just myself, I often look at social media during my breaks (at work, I would usually talk to someone or do something else).*

Although many considered this increased use to be a negative (e.g., "I go on my phone way more than I used to and I don't like when I spend a lot of time on it"), one participant described it as quite positive:

> *With less to do and fewer places to go I am on my phone more. I am usually on it playing puzzles while I watch my class lectures. This actually helps--I find I can focus on the audio when I have a visual stimulation because I'm less likely to get bored and tune out. It is similar to how I listen to podcasts and play the puzzle games. So this is a positive.*

The third impact of the COVID-19 pandemic on use seemed to be an increase in **purposeful use** of smartphones. Participants described using their smartphones for a specific

purpose that either provided them connection or entertainment. Connection with loved ones was often reported as purposeful use: “The most important feature my phone offers is the ability to connect with friends and family, especially during COVID as most of my social network are currently in Toronto.” This was seen across the majority of participants, even if loved ones were living nearby: “I also use it to keep in touch with people more, due to the restrictions on gatherings.” The importance of connection was highlighted by one participant who explained,

> *My phone connects me to so many people, so when I could not visit my family, friends, or boyfriend, it was my only method of communication. I also was in quarantine for two weeks, so my phone was the only thing that allowed me to contact other people.*

Second, the pandemic led many participants to use their smartphones with a purpose of entertaining themselves, with one participant describing their smartphone as “the only source for me to entertain myself.” Some took the opportunity to “[learn] many new activities and professions online” while others used the smartphones to replace in-person leisure, as described here: “Because of Covid I couldn't get book issued from library so I used my smartphone to read books online and that's how the usage increased.” The last important purpose of smartphone use described by participants due to the COVID-19 pandemic was staying informed as participants described “spending time with smartphone more in covid response, getting to know many news from govt regarding covid response.”

Although the COVID-19 pandemic impacted student use of smartphones by changing, increasing, or bringing more purpose to their use, it seems smartphone use patterns have started **returning to pre-COVID-19 pandemic levels**. For example, one participant stated, “Not a dramatic change but I definitely spent more time on my phone when mandatory self-isolation was in effect this spring. Now that restrictions have lifted though I think my relationship with my

phone is pretty similar to before." Many students described this return to pre-COVID pandemic use was caused by the return of school, even if online. One participant stated, "[…] once work and school opened up, and we came back to some sort of norm, I had gone back to my old habits", and another echoed this by saying, "I spent a lot more time on it when I was home all day, but now that I am back at school, I'm going back to regular phone usage."

While the COVID-19 pandemic presents another factor influencing smartphone use among students, it is clear this use is individualized and determined mainly by the user.

4.2.8 COVID's Impact on Smartphone Relationships

As mentioned above, smartphone use was impacted by the COVID-19 pandemic, and smartphone use drives smartphone relationships. Not surprisingly, smartphone relationships were also impacted by the pandemic. As one participant states, "the dependency on mobile phones and usage has increased significantly", however this dependency was described in both positive and negative ways by participants.

To fully understand the **negative impacts** the COVID-19 pandemic has had on smartphone relationships, it is important to acknowledge that participants experienced more than simply a pandemic as there were racist attacks and protests in Canada and across the world, Canada's largest mass shooting, and the American election. As the pandemic increased the use of smartphones for many, a common root of negative relationships with smartphones was the increased access or exposure to **negative news**: "Smartphone is overwhelmed with information and (sometimes) bad news"; "The news I read on it is also increasingly upsetting, which doesn't help." Some participants described their own list of negative news that they were accessing through their smartphone: "News - I have a google phone where the news is on a reel on the

home page. When quarantine began it was constant terrible news about COVID, Australian fires, Trump, BLM, etc. etc. having access to so many negative things upsets me, but I also want to be informed."

One portion of the negative news was related to the **COVID-19 pandemic**. As described by participants, "I found it very draining to be on my phone during COVID-19 as the content was very negative and nothing new was being posted." As it relates for health information, one participant explained, "obviously not all information is true and I had to limit the amount of news I was reading on my phone about covid because it brought me greater anxiety." Other participants described the stress related to the **state of the world** (e.g., "The problem becomes when I use it too much and then get stressed from the negative articles on Facebook about the state of the world.") **and of Nova Scotia** specifically (e.g., "Many miscommunications I find media stressful, so many opposing opinions on Facebook can be rude, scary, and make me worry about the state of the province."). As mentioned earlier, seeing the traumatizing images, videos, and stories related to **racist violence** were a source of negative smartphone relationships among racialized participants. Although seen through a different lens and not necessarily experiencing the same type or level of trauma, non-racialized participants also described being overwhelmed by these news stories. One participant summarized this experience:

> *The death of George Floyd and the outrage that has followed from that, the renewed debate about BLM* [Black Lives Matter] *vs. ALM* [All Lives Matter]*, the American election, the inequities in society that have only been exacerbated by COVID but are only now being realized by some members of society, and people not wanting to wear masks are all new. Racism is certainly not new, but Floyd's death has sparked GLOBAL outrage that I have not experienced before in my life. I definitely feel more stressed now*

because almost everyday there is a new case of police brutality or race-based violence that is reported on social media and it is triggering over and over again.

A second source of negative smartphone relationships due to the COVID-19 pandemic was the **exacerbation of the previously described negative factors** on smartphone relationships, such as always being available and impacts of social media. Participants described that the pandemic and its associated outcomes (e.g., isolation) caused an increase in being available: "[…] there's an increase in expectations of being available all the time since there's been a shift to remote working. And your home area becomes your work area and home computer and phone become your work computer and phone." Participants also described how social media's impacts have also been amplified, with one participant explaining, "There is more fear and panic now than ever on social media and not having contact with people to learn the actual feelings and emotions makes the situation seem far worse than it is."

A final negative impact of the COVID-19 pandemic on smartphone relationships is the increased use that was considered to be **unhealthy, unproductive, or useless** by participants. For example, one participant explained that they "[…] procrastinate with my smartphone more now than I had before." Many participants described the distracting nature of smartphones, such as "I think being at home more has made it an increased distraction" and "It was a great source of distraction during self-isolation, but also made me feel horrible!!" Many described the use of smartphones out of boredom, such as "I was using it because I was bored and it was creating negative feelings at that time with my phone." Finally, some experienced a combination of these:

Drain from WFH because I can just scroll on my phone. Dread some messages as people know I am easy to get a hold of now. Overall my phone plays a larger role because when

I am not doing something I just find myself mindlessly scrolling. However, I see myself viewing my phone in a more negative light.

Although there were several negative impacts of the pandemic on smartphone relationships, participants also described several **positive impacts** as well. As described by one participant, “Nowadays as virtually everything is done due to COVID-19 so it's playing a very important role in my life right now. It's a totally positive relationship with my phone.” The biggest positive impact of the COVID-19 pandemic on smartphone relationships was the increased use for **connection and socialization**. For example, one participant explicitly mentioned their improved smartphone relationship in this context, saying “In a sense, yes. But only because it played such an important role in connecting me with my loved ones. I think I've developed a better, more positive relationship with my phone due to COVID.” Other participants described how their smartphone relationship was positive due to its ability to connect them with others: “in times like a crisis like covid-19 I would say it was very positive to be connected when not actually physically being able”; “I am positive about my phone because it’s the source of my connection to other people when maintaining social distancing during pandemic and moreover a reliable support to do activities like studying, banking, leisure activities etc.”; “I feel this made my relationship with it much more positive as without it I would have felt alone.” Connection and socialization were described as necessities to avoid loneliness, especially when in isolation. For example, “it is more important for me to have my phone now that COVID exists - I don't think I would have survived 14 day isolation without it” and “I became more reliant on my phone due to the isolation impacts of COVID-19." With a long list of comments related to this increase in connection and socialization, one participant summarized it quite well in one sentence: “when social distancing hits us, smartphone reunite us.”

A second positive impact of the pandemic on smartphone relationships was the **increased awareness** many participants described experiencing. It is not surprising that, as participants' smartphone use increased, their awareness of their use increased as well. For example, one participant stated, "I think my reliance is unchanged, but I'm more aware of how useful it can be", and another said, "I have become more aware of my relationship with my phone and my relationship to it is more complicated." This increased awareness led many participants to implement strategies to improve their relationship with the smartphone, as described earlier. For example, one participant shared,

> *After being stuck in my house for 2 months during quarantine I've noticed I use my phone far too much, so I've made a conscious effort to limit my screen time. I've also made an effort to follow accounts on Instagram that spread positive and inspiring messages so that the media I'm consuming has some sort of benefit other than just entertainment.*

As participants became more aware and started implementing strategies, one participant described how their smartphone use ultimately did change: "Since Covid I find my phone became an even bigger source of stress since I see bad news plastered everywhere. Covid actually changed my patterns with my phone and I find great joy in disconnecting from it."

A final note regarding impacts of the COVID-19 pandemic on smartphone relationships is the gradual **return to pre-pandemic trends**. Like smartphone use, smartphone relationships seem to also be returning to previously held relationships. As smartphone relationships seem to be based on smartphone use, this return follows suit, with one participant stating, "It gave me things to occupy my time and it became a bigger role in my life during this time. Not so much now where things have settled down it plays a smaller role", and another echoing this by saying, "Now that restrictions have lifted though I think my relationship with my phone is pretty similar

to before." Similar to smartphone use, this return to pre-pandemic relationships may have also been related to the start of school, as one participant describes, "but now that school has began [sic] again my relationship is much more positive and overall neutral."

Findings related to smartphone use and relationships, and how they have been impacted by the COVID-19 pandemic lend us to conclude that participants hold nuanced and complex relationships with their smartphones based on their smartphone use. As described by participants, these relationships can impact mental health in a variety of ways, and strategies can be implemented to improve one's smartphone relationship. To add to this complexity, the pandemic not only had an impact on participants' smartphone use, but also their smartphone relationships, even though they are not long lasting as they slowly return to pre-pandemic trends.

4.3 Is there a moderating relationship between mental health, leisure coping, and resilience? (Research Question 2)

Model building was used to determine if leisure coping beliefs and strategies would be moderators in the relationship between mental health challenges (stress or anxiety) and resilience. The figure below illustrates the four models tested.

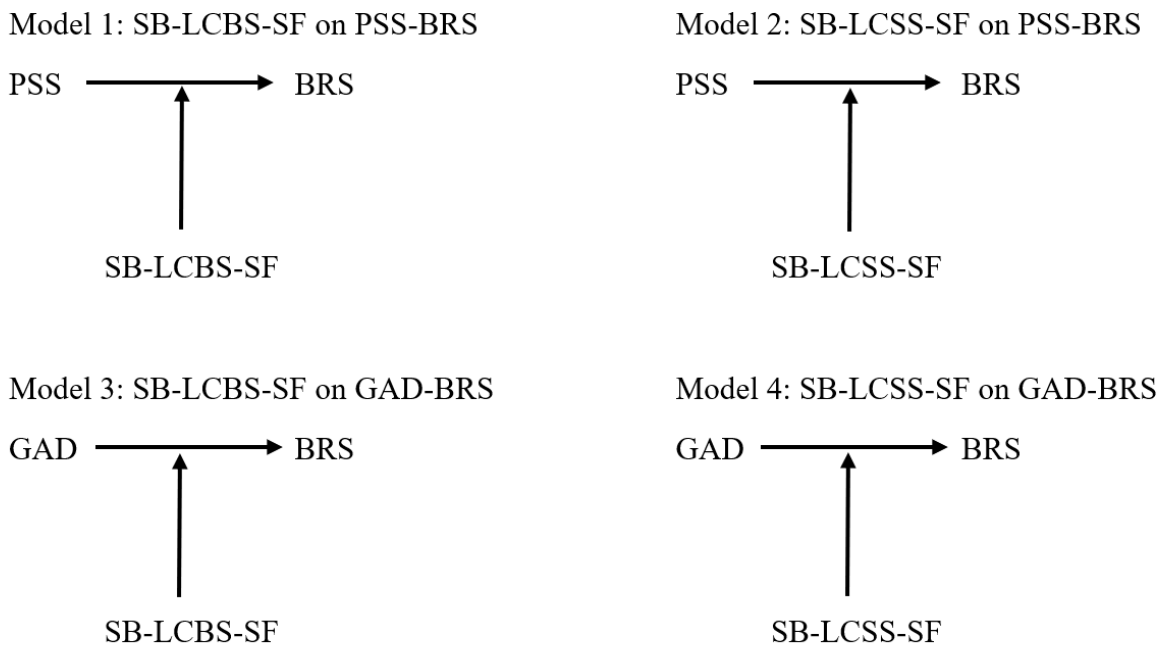

Figure 3 Moderating Relationship Models

Models were created to conduct the moderation analyses examining if leisure coping beliefs (SB-LCBS-SF) or strategies (SB-LCSS-SF) would be moderators of the relationships between mental health challenges (PSS or GAD-7) and resilience (BRS). Model summaries of all four analyses were significant, detecting significant main effects but no moderation effects: Model 1 summary, $F(3, 161) = 42.3685$, $p < .0001$, $R^2 = .4412$; Model 2 summary, $F(3, 161) = 42.7700$, $p < .0001$, $R^2 = .4435$; Model 3 summary, $F(3, 161) = 30.5879$, $p < .0001$, $R^2 = .3630$; Model 4 summary, $F(3, 161) = 30.1885$, $p < .0001$, $R^2 = .3600$. In model 1, there was a significant main effect of PSS ($b = -.6712$, $SE = .1621$, $p = .0001$, 95% CI [-.9914, -.3510]) but a non-significant interaction between PSS scores and SB-LCBS-SF scores, $b = .0038$, $SE = .0030$, $p = .2052$, 95% CI [-.0021, .0096]. In model 2, there was a significant main effect of PSS ($b = -.6686$, $SE = .1675$, $p = .0001$, 95% CI [-.9993, -.3379]) but a non-significant interaction between

PSS scores and SB-LCSS-SF scores, b = .0048, SE = .0040, p = .2280, 95% CI [-.0030, .0127]. In model 3, there was a significant main effect of GAD-7 (b = -.6678, SE = .1729, p = .0002, 95% CI [-1.0093, -.3262]) but a non-significant interaction between GAD-7 and SB-LCBS-SF scores, b = .0034, SE = .0031, p = .2779, 95% CI [-.0028, .0096]. Finally, in model 4, there was a significant main effect of GAD-7 (b = -.5920, SE = .1815, p = .0014, 95% CI [-.9505, -.2335]) but a non-significant interaction between GAD-7 scores and SB-LCSS-SF scores, b = .0026, SE = .0044, p = .5497, 95% CI [-.0060, .0112]. These results indicate that perceived stress and anxiety are both significant predictors of resilience, where an increase in perceived stress or anxiety will lead to a decrease in resilience. However, in all four models, leisure coping was not a significant moderator.

The second null hypothesis is stated as "the relationship between mental health challenges and resilience will not be moderated by leisure coping". As there were no significant interaction effects in any of the four models, the null hypothesis cannot be rejected.

4.4 Are post-secondary students using smartphones as a form of leisure coping, and has this been changed by the COVID-19 pandemic? (Research Question 3)

4.4.1 Coping and Leisure Coping

Students were asked if they used their smartphone for coping and, if so, were also asked if they perceived this to have changed due to the COVID-19 pandemic. Results show that 64.32% of students reported using their smartphone for coping. Students also scored the IAO of their smartphone-based coping retrospectively for before the start of the pandemic (pre-COVID IAO) and since the pandemic has started (post-COVID IAO). Pre-COVID IAO was significantly higher among participants who identified their use of their smartphone for coping (M = 8.87, SD

= 2.98) as compared to participants who identified not using their smartphone for coping (M = 6.11, SD = 3.23), $t(170) = 5.22$, $p < .001$. Post-COVID IAO found similar results as scores were significantly higher among participants who identified using their smartphone for coping (M = 8.65, SD = 3.13) than those who did not (M = 6.00, SD = 3.46), $t(170) = 4.94$, $p < .001$. However, participants who identified using their smartphone for coping had significantly lower BRS scores (M = 18.43, SD = 4.64) than those who identified not using their smartphone for coping (M = 20.70, SD = 4.54), $t(164) = -3.057$, $p = .003$.

Individuals who identified using their smartphones for coping had significantly higher SB-LCBS-SF scores (M = 55.05, SD = 13.17) than participants saying they don't use their smartphone for coping (M = 48.77, SD = 15.03), $t(174) = 2.87$, $p = .005$. A similar relationship was seen where participants who used identified using their smartphone for coping had significantly higher SB-LCSS-SF scores (M = 43.08, SD = 9.13) than participants saying they did not use their smartphone for coping (M = 34.95, SD = 11.01), $t(172) = 5.21$, $p < .001$. SB-LCBS-SF and SB-LCSS-SF scores were found to have a significant strong correlation, $r(163) = .810$, $p < .001$. SB-LCBS-SF scores were found to be significantly and strongly correlated to both pre-COVID IAO scores [$r(163) = .607$, $p < .001$] and post-COVID IAO scores [$r(163) = .644$, $p < .001$]. Similar results were found with SB-LCSS-SF scores having significant and strong correlations with both pre-COVID IAO [$r(163) = .641$, $p < .001$] and post-COVID IAO [$r(163) = .709$, $p < .001$].

4.4.2 Perspectives on Leisure Coping and Smartphone-Based Leisure Coping

In terms of qualitative comments provided by participants, it was evident that **leisure** plays an important role in many students' lives. Leisure in general was described as "[…] an

essential part of my mental health management, work-life balance, and a source of social opportunities." The following are examples of **leisure coping strategies** described by participants: "Power nap, writing, reading, painting, worshipping my God, meditating and dancing boost up my energy and keeps me sane."; "[…] sometimes being with friends gets my mind off of anything bothering me"; "Outdoor activities and unplugged time is especially important to me to decompress"; "For example when I'm feeling stressed I'll go for a run or go to the gym"; and "I find that when I read, write, and paint, that my mind feels at peace when doing things that I love doing." Participants highlighted the **importance of leisure in coping**, mainly for its beneficial outcomes on their mental health. For example, one participant said, "Leisure activities provide me with enjoyable time and relaxation, they help me de-stress and allow me to be more productive and happy, so I would say they are very important to me, and making time for them is vital." Another participant explained how, "I get overwhelmed if I go too long without feeling I have had enough leisure time in my life."

In terms of smartphones, participants did identify their **smartphone as a tool for coping**. For example, one participant highlights its importance for coping, stating "I found it helpful when I couldn't deal with what was happening around me." Another participant echoed this type of use, saying "I use my smartphone more for coping and less for other reasons." While smartphones were described as a tool for coping, they were also described as a **tool for accessing and/or experiencing leisure**. For example, one participant stated, "I can use it to contact my family in my leisure time, play games", and another explained their many uses of their smartphone for leisure: "Leisure: I use my smartphone for entertainment (music, audiobooks, videos, movies) and staying connected with others." Bringing leisure and coping together, participants also described their smartphone as a tool for leisure coping, sharing their

smartphone-based leisure coping strategies: “When I feel stressed I often pull out my phone and play games for a few minutes to calm down”; “like being able to call my parents, watch videos and listen to music when I’m stressed out”; “Scrolling though Instagram if I am in a tired or unhappy mental state”; and “So I used smartphone to communicate more with family and friends in order to relieve my stresses.”

It is important to recognize that some participants also described their smartphone-based leisure coping as **negative**. For example, one participant explained, “I think spending the time that I do on my smartphone is unproductive and in terms of coping does not help me improve my coping skills in the future.” Some participants described how their use of the smartphone for coping was leading to **negative outcomes**, with one participant explaining, “I was using it for stress relief but sometimes depending on what’s on social media it can make it worse or play on insecurities”, and another stating, “Using my phone may temporarily relieve stress, but often I am just more stressed after as I feel bad for just wasting time on my phone.” Finally, some described one’s smartphone use for coping as being in **parallel with substance use and addiction**, with one participant stating, “I am probably more addicted to it than I should be and sometimes get pulled into endless scrolling when I'm bored or trying to self-soothe”, and another saying, “In the present moment, my phone acts a bit like heroin. It provides an escape, but also immediate guilt about doing the wrong thing.”

4.4.3 COVID’s Impact on Coping and Leisure Coping

Of participants who identified using their smartphone for coping, 51.35% reported that their use for coping was not changed due to the pandemic. Participants pre- and post-COVID IAO scores were examined and found to not be significantly different, $t(171) = 0.317$, $p = .752$,

demonstrating a consistent perception regarding the effectiveness of using one's smartphone for coping, whether good or bad effectiveness.

As mentioned earlier, individuals with a disability were 2.95 more likely to report using their smartphone for coping. There was also a significant association between the participants' disability status and whether their use of smartphone for coping was changed by the pandemic, $\chi^2(2, N = 209) = 7.45$, $p = .024$. Based on the odds ratio, the odds of one's use of their smartphone for coping having been impacted by the pandemic were 2.49 times higher if they reported having a disability.

According to participants, the COVID-19 pandemic impacted leisure, and therefore leisure coping, in a variety of ways. Some leisure was **positively impacted** as participants had **more time** for leisure. One participant stated,

> *I've made more time for other leisure activities and things I care about as a result. I really appreciated how COVID led me to hit pause on my life and take note of where I was spending the majority of my time and energy.*

Solitary leisure was positively impacted according to some participants. For example, one participant shared, "Painting, I painted more during the pandemic", and another stated, "I listen to music, read a book, or play video games on my laptop. I have been doing these more as well since COVID-19." Some described a combination of these positive impacts as people had more time to engage in solitary leisure, as described by participants: "I enjoy cooking to help destress. I've had more time to look up recipes and try new things during the pandemic lockdown"; "Running, other physical activity, cooking. I have been able to do these activities more as I have had more time during COVID"; "I've had more time to paint and cultivate plants during COVID (my collection grew from 2 plants prior to COVID to now 60+)."

Some leisure was **unaffected** by the pandemic. For example, **solitary leisure** was sometimes identified as having been unaffected. For example, one participant stated, “Relaxing by playing guitar (not impacted) Meditation (not impacted)”, and another saying, “typically I listen to music or read a good book, I suppose. These have not been affected by COVID-19". **Outdoor leisure** (within COVID-19 pandemic restrictions) was also considered to be unaffected, often described with other solitary leisure. For example, one participant said, “I write, paint, and go for walks, and these activities have not been impacted by COVID-19.” Another participant shared, “Hobbies - reading, arts, hiking. Not really impacted by COVID.” As can also be seen in some of these examples is that **home-based leisure** was also identified as unaffected. For example, one participant stated, “Spending time with pets, it has not changed from COVID.”

Some leisure was **modified or changed** in response to the pandemic. This included **leisure with modification possibilities**; for example, “My martial arts club got shut down, but thankfully I have a few friends and we can meet at the park to workout together” and “I frequented the gym 2x a week prior to COVID and that was paused for a while, so I began doing at-home workouts with my mom via FaceTime which was incredibly fun and fulfilling (physically and emotionally)”. Second, some participants chose to **swap one leisure for another**: “but choir is non-existent during Covid. I suppose I've replaced choir with going for daily walks as my form of relaxing and energizing leisure, but walks are relaxing, rather than energizing, like choir is.”

Finally, there were two types of leisure that were **negatively impacted** by the pandemic. First, leisure with **specific needs**, such as a specific location or equipment, was impacted. One participant stated, “I can't go bouldering as much because of restrictions on indoor spaces and Covid”, and another person saying, “Reading - libraries closed so this was not affordable.”

Second, **group leisure and socialization** were also negatively impacted as described by participants: “It has impacted it because During COVID I was unable to meet with friends, see family”; “It's also been hard to be as social as I was before.” Some participants even described a combination of group leisure with specific needs that was impacted: “Usually I would play basketball, which was severely impacted by COVID-19”; “-recreational team sports: university intramurals and city leagues were cancelled for most of the summer so I wasn't able to play as many sports as usual which would have helped me cope with my stress”; “Going to the gym, going to restaurants, seeing friends. These have been impacted greatly by COVID.”

In terms of the **COVID-19 pandemic's impact on smartphone-based leisure coping** specifically, there seemed to be a general trend towards **increased use**. The increased use seemed to be in response to decreased opportunities for other leisure, which was described by one participant, saying “As the ability to pursue more active or meaningful leisure activities have dwindled in response to covid restrictions, I find myself relying more and more on my smartphone to distract or entertain me”, and another succinctly explaining that increased restrictions led to “more leisure: social media or movies”. This increased smartphone use for smartphone-based leisure coping may also connect to the increased use described earlier. These findings related to smartphone-based leisure coping lend us to conclude that participants did, and continue to, use their smartphones for leisure coping. However, there are some contradicting perspectives as quantitative data presents smartphones as a tool for leisure coping while qualitative data presents a nuanced understanding of the role smartphones play in leisure coping and its outcomes.

4.5 SUMMARY

Statistically, participants' demographics have significant relationships with the individual's leisure coping, mental health, and/or resilience. However, as described by participants, one's use of, and relationship with, their smartphone is very individualized and personal. Participants had generally mixed relationships with their smartphones, and these relationships were often based on their use. Some smartphone uses (e.g., using one's smartphone as a tool) were categorized as positive and as leading to positive relationships. Other smartphone uses (e.g., social media, constant availability) were categorized as negative and as leading to negative relationships. To improve these relationships, some participants identified strategies used to build a more positive relationship with their smartphone. In the case of smartphone-related leisure, leisure coping was not a significant moderator in the relationship between mental health and resilience. However, many students identified their use of their smartphone for leisure, coping, and leisure coping. Participants described the importance of leisure in their lives and how their smartphone is a tool for accessing and/or experiencing leisure and how some have developed smartphone-based leisure coping strategies. Finally, the COVID-19 pandemic was identified as having various impacts on student smartphone use, smartphone relationships, strategies for improving relationships, and leisure coping.

CHAPTER 5 DISCUSSION

This study explored smartphones and their role in leisure coping among postsecondary students, and how this was impacted by the COVID-19 pandemic. Through an anonymous online survey, Nova Scotia post-secondary students shared their own perspectives and experiences of smartphone use, smartphone relationships, coping, leisure, and the pandemic. This discussion will present: 1) the context and impacts of the COVID-19 pandemic, including relationships with technology, the amplification of both negative impacts and smartphone-based leisure coping, and the increased awareness among students; 2) smartphone use as it relates to marginalized populations, use for leisure, and the problematization of some smartphone uses informed by subjective understandings of smartphone use's impact on health; 3) how smartphone use connects to coping (e.g., emotion-based coping) and leisure coping, the Hierarchical Dimensions of Leisure Stress Coping model and its components, why smartphone-based leisure coping was not a significant moderator, and contrasting perspectives of smartphone-based coping benefits; and finally, 4) student mental health and its connection to smartphone relationships and strategies to improve these relationships, as well as a comparison between people and technology.

5.1 COVID-19 Pandemic Context

This study found that students' leisure and relationships with technology were impacted in many ways by the COVID-19 pandemic and other significant world events. As students have been known to be exposed to traumatic events happening around the world through their smartphone (Nixon et al., 2018), this could negatively contribute to smartphone relationships and be a factor in a student's poor mental health. This connection between exposure to traumatic events through media and its impact on mental health is supported by previous literature related

to graphic content (Hirschberger, 2018; Holman et al., 2014, 2020), health information related to the pandemic (Chao et al., 2020; Garfin et al., 2020; Thompson et al., 2017), and the additional impacts of isolation (e.g., Brooks et al., 2020). One of the biggest concerns regarding these impacts was whether or not these would have long-lasting effects. As students seem to return to pre-pandemic trends both in terms of their smartphone use and relationships, it seems the impact of the COVID-19 pandemic is only temporary in these ways.

In terms of the effects experienced during the COVID-19 pandemic, students seem to have experienced similar outcomes from smartphones to those experienced before the pandemic (e.g., negative effects from constant availability and social media) but seem to have had amplified effects due to isolation and being without other leisure or ways to connect. As mentioned above, this could be due to the added trauma experienced through the pandemic as many students were accessing news and information through their smartphones, and more specifically, through social media. Other research exploring the impact of social media on mental health during the COVID-19 pandemic found a significant association between disaster-related social media consumption and negative mental health, including secondary traumatic stress, depression, and anxiety (Zhao & Zhou, 2020).

Also, there seemed to be an increased amount of smartphone-based leisure coping among students during the pandemic for similar reasons. This contradicts the statistical results showing only about half of students who had a change between their pre- and post-COVID use of smartphones for coping. As will be explained later, this is one example where students' descriptions of their experiences do not always agree with the statistical results. This increase in use of smartphones for coping was predicted by early COVID-19 literature that said there would be a significant impact on regular coping methods in response to the pandemic (Horesh &

Brown, 2020), and is also supported by previous studies that found the increased use of mobile phones when experiencing discomfort or stress, potentially for distraction or reaching out to others (Chiu, 2014; Murdock, 2013). A recent global survey also found that 70% of internet users had an increase in smartphone (or mobile phone) use due to the COVID-19 pandemic lockdown (Sebire, 2020).

As students increased smartphone use during the pandemic, they also had increased awareness of their use patterns and habits, leading many of them to be more mindful of their smartphone use and relationships. The idea of increased mindfulness of smartphone use during the pandemic has also been discussed publicly through blog posts and media (Borresen, 2020), demonstrating a general awareness of how important this mindfulness can be in protecting users' mental health. This increased mindfulness around one's smartphone use can lead to positive outcomes such as increased well-being, more positive affect, and less stress (Bauer et al., 2017). Due to this increased awareness and mindfulness regarding smartphone use and relationships, this may have been an additional benefit to conducting this research during this time as students were already giving thought to this topic and could provide insightful and in-depth answers.

5.2 SMARTPHONE USE

When examining the results, it is clear students use their smartphones for a variety of purposes, including leisure. Previous literature which has also identified this potential use of smartphones for leisure includes uses such as social media and socializing/connecting with others (Janković et al., 2016). However, it is also important to note that, although students acknowledged the ability to access leisure through their smartphone, they did not seem to place as much value on smartphone-based leisure as they did on leisure in general. This was also seen

in research exploring adolescents' experiences with smartphone-based leisure, where some leisure-based smartphone use was to avoid boredom and considered not satisfying (Allaby & Shannon, 2020). They also found that when adolescents described intentional use of their smartphone (e.g., meeting the need to relax or connecting with friends), this use was meeting the level of stimulation they were seeking, and therefore more satisfying (Allaby & Shannon, 2020). These findings are similar to the current study where intentional use (e.g., using smartphone as a tool) yielded different outcomes than uses that may have been, in part, connected to boredom (e.g., social media).

Students identified various smartphone uses that they categorized as either positive or negative. For example, smartphone use perpetuating the notion of constant availability was considered to be negative, which is supported by previous research connecting these behaviours to loneliness, low self-esteem, depression and anxiety (Elhai et al., 2017). The terms "positive" and "negative" were used to categorize students' responses as many students chose to use these terms to describe their own smartphone use and relationships. However, this presents the problematization of some smartphone uses as inherently negative. For example, "mindless scrolling", "waste of time", and "unproductive" were used by some students to describe smartphone-based leisure. This language exemplifies the notion of *conspicuous busyness*, referring to how people present themselves as constantly busy in all aspects of life (Shir-Wise, 2019), and is suggesting that leisure should also be part of this 'busyness'. However, leisure can still contribute to health and well-being without being mindful, productive, or a good use of time (Hutchinson & Kleiber, 2005). This type of leisure can be considered *casual leisure*, with other examples including taking a nap or leisure as a distraction (Hutchinson & Kleiber, 2005). Interestingly, when asked about leisure more generally in their lives, many students not only

stressed the importance of leisure for their health and well-being, but also provided a variety of examples, many of which could be considered casual leisure: watching television or streaming services (e.g., Netflix), relaxing on their couch at the end of the day, and using substances (e.g., alcohol, cannabis). This presents an interesting point around the subjective categorization of certain types of leisure and how smartphone-based casual leisure seems to be viewed more negatively than casual leisure more generally.

These results lend us to conclude that our perceptions of "positive" or "negative" smartphone uses and smartphone relationships are based on our subjective understandings of their impacts on health. It appears students who identified receiving health benefits (e.g., peace of mind, social connections, fun/happiness, leisure coping) from their smartphone use held more positive relationships with their smartphones, while students perceiving more detriments to their health (e.g., increased stress or anxiety) held more negative smartphone relationships. Perceptions of smartphone use as being "healthy" or "unhealthy" may be influenced by society's understanding of smartphones and their influence on health. This understanding may be based off much of the smartphone literature describing excessive smartphone use and/or smartphone addiction as having an association with negative mental health or social outcomes, such as psychological distress (Beranuy et al., 2009), depression (Thomée et al., 2011), social anxiety (Pierce, 2009), and loneliness (Herrero et al., 2019; Tan et al., 2013). However, as these studies focus on excessive use and/or smartphone addiction, they do not present an accurate picture of the impacts of all smartphone use. Recent literature has determined that "normal" or "reasonable" use can lead to, or be associated with, positive outcomes related to social relationships (Al-Kandari & Al-Sejari, 2020), social capital and subjective well-being (Bae, 2019), positive effects on student life satisfaction (Kil et al., 2021), and a negative association

with mental health problems (Kil et al., 2021). Similarly to literature related to substance use addiction versus non-problematic substance use (Kiepek et al., 2019), much of the smartphone literature stresses problematic and addictive smartphone use rather than non-problematic smartphone use, therefore not accounting for the complexity of smartphone relationships (Carolus et al., 2019). This influence on our perspectives regarding leisure, smartphones, and health seems to exclude the possibility of using smartphones as a form of leisure coping. Since using a smartphone as a tool was considered to be positive, and previous literature posits that leisure can be an important resource or strategy for successfully managing stressors (Iwasaki, 2003), this presents an opportunity to introduce the possible health benefits of using a smartphone as a tool for leisure coping.

5.3 Coping and Leisure Coping

Coping researchers have previously acknowledged that it is not simply an individual's experience of perceived stress that influences their health, but also their coping resources and strategies (Gottlieb, 1997; Lazarus, 1999; Taylor & Stanton, 2007; Zeidner & Endler, 1996). Results of this study demonstrate that the majority of students personally identify using their smartphone for coping, supporting other research that indicated the potential use of smartphones for coping (Grellhesl & Punyanunt-Carter, 2012; Nehra et al., 2012; Panova & Lleras, 2016). Based on descriptions provided by students, it seems much of the coping through the use of smartphones is emotion-focused coping, in which the goal is to address one's negative emotions (Folkman & Lazarus, 1980). This also relates to the theoretical notion of "goodness of fit" as emotion-focused coping is often used when there is low controllability of the problem (Conway & Terry, 1992; Folkman, 1984; Zeidner & Saklofske, 1996). In this case, as students were

experiencing uncontrollable stressors such as the pandemic, health restrictions, and traumatic experiences, in addition to other everyday uncontrollable stressors, it is no surprise that students turned to their smartphone for this type of coping. As social support has previously been identified as a major coping strategy among students (Roming & Howard, 2019; Thompson et al., 2016), it also explains the use of smartphones for communication, socialization, and connection, which could also be considered social coping (Zautra et al., 1996).

Students identifying the use of their smartphone for coping had significantly higher scores in leisure coping scales, showing that many students do use their smartphone for leisure coping specifically. These students also had higher scores in both pre- and post-COVID immediate adaptational outcomes, demonstrating the perceived effectiveness of this coping. This is explained by previous literature describing how individuals with greater leisure coping beliefs tend to implement leisure coping strategies, therefore facilitating more immediate adaptational outcomes and leading to more positive impacts on health (Iwasaki, 2003). Interestingly, students who identified using their smartphone for coping had lower scores in resilience. The opposite is suggested by the notion that smartphone use for coping can lead to increased resilience (Panova & Lleras, 2016) and that leisure coping can increase an individual's resilience (Joudrey & Wallace, 2009; Mausbach et al., 2012).

The Hierarchical Dimensions of Leisure Stress Coping model depicts leisure coping as being made up of leisure coping beliefs and strategies (Iwasaki & Mannell, 2000). As it pertains to smartphone-based leisure coping, it seemed smartphone-based leisure coping beliefs and strategies had parallels with smartphone relationships and use, respectively. Strong smartphone-based leisure coping beliefs seem to be made up of a smartphone relationship with a positive belief that it would provide leisure coping benefits. Strong smartphone-based leisure coping

strategies seemed to come from smartphone use that is purposefully used for coping reasons. The following theoretical equations depict these connections:

(1) Smartphone-based leisure coping beliefs = smartphone relationship + belief that it can provide leisure coping benefits

(2) Smartphone-based leisure coping strategies = leisure-based smartphone use + coping reason

These theoretical equations not only further explain how smartphone-based leisure can be used for coping purposes, but also how this seems to align with the Hierarchical Dimensions of Leisure Stress Coping model. However, one important note regarding the model is how the categorizations of leisure coping strategies represent more so the reasoning for leisure coping strategies, not strategies themselves. For example, a leisure coping strategy may be to play a game with the reasoning being for mood enhancement. Another example is the strategy of going for a walk with the reasoning being to take a break (i.e., palliative coping). In similar ways, students demonstrated using their smartphones for leisure coping with the reasoning being to boost their mood (i.e., leisure mood enhancement), connect with others (i.e., leisure companionship), and take a break from stressors (i.e., leisure palliative coping), but the actual strategies were described as playing a game, texting a friend, and listening to music, as examples. It is therefore suggested that the Hierarchical Dimensions of Leisure Stress Coping model be revisited not only regarding our understanding of leisure coping strategies and their reasoning, but also to include leisure that may not have been available at the time of its development (e.g., smartphone-based leisure).

In addition, the alignment of smartphone-based leisure coping beliefs and strategies with this model is also supported by the dispositional and flexible situation-based coping styles

related to leisure coping beliefs and strategies, respectively (Iwasaki & Mannell, 2000). As leisure coping beliefs represent dispositional coping styles, usually developed over time and having a stable psychological position (Iwasaki & Mannell, 2000), it is possible to see how smartphone relationships align with this concept. Smartphone relationships would be built over time as the individual uses the technology, eventually developing beliefs regarding its usefulness for coping and leisure coping. In comparison, as leisure coping strategies are more flexible and situation-based coping (Iwasaki & Mannell, 2000), aligning with the ever changing leisure coping strategies that may be adopted by a smartphone user. The strategies used may not only change due to the situation and stressor, but also as smartphone apps and uses continue to evolve over time due to user preferences and technological advancements. The stress appraisal concept states that a person's coping beliefs will lead to the use of coping strategies, which then feeds back into the coping beliefs, creating a cycle (Lazarus, 1966). This cycle also applies to leisure coping, where an individual appraises a stressful event, determines potential coping based on leisure coping beliefs, and then partakes in leisure coping strategies (Iwasaki & Mannell, 2000). This study supports this stress appraisal cycle in the context of smartphone-based leisure as it suggests that an individual develops leisure coping beliefs (e.g., smartphone relationships) by first using leisure coping strategies (e.g., smartphone use) and appraising their usefulness and effectiveness (e.g., immediate adaptational outcomes). It is with these adopted beliefs that then the individual would complete the stress appraisal cycle by employing strategies to cope.

For students who held positive smartphone relationships, it seems as though using their smartphone as a tool for leisure coping came naturally or at least was considered as a tool for coping with stress. This supports the concept of smartphones acting as a security blanket for students and a tool for coping (Panova & Lleras, 2016). Although leisure coping can take many

forms and does not have to be accessed through technology, smartphones can provide easy and quick access to leisure for coping, especially in times of isolation. For example, during the COVID-19 pandemic, a trend called #QuarantineChallenge2k20 swept social media, encouraging families and/or households to gather, sing, and dance to popular music and sharing this content on social media (Stodolska, 2021). On the other hand, students who hold negative smartphone relationships may not see the benefit or potential of using their smartphone as a tool for leisure coping, in addition to their mental health being negatively impacted by this relationship. This presents the importance of evaluating one's smartphone use and relationship and, in turn, implementing strategies to improve this relationship; this may not only minimize its negative impacts on mental health but also potentially introduce the possibility of using one's smartphone for leisure coping.

As this discussion presents the possibility that using one's smartphone for leisure coping can provide mental health benefits, it is important to address why leisure coping beliefs and strategies were not statistically significant moderators between mental health challenges and resilience. Previous literature has found that leisure coping can lead to increased resilience (Joudrey & Wallace, 2009; Mausbach et al., 2012), and many studies have found beneficial health outcomes from participation in leisure (Johnson & Kalkbrenner, 2017; Kimball & Freysinger, 2003; Zerengok et al., 2018; Zhang & Zheng, 2017). Past leisure literature has found leisure to be a moderator between mental health challenges, such as stress, and health outcomes (Coleman & Iso-Ahola, 1993; Iwasaki, 2006). In this study, the original LCBS-SF and LCSS-SF were altered; the term "leisure" was replaced by "smartphone-based leisure", and therefore were referred to as the SB-LCBS-SF and SB-LCSS-SF. This leads to two potential explanations: (1) smartphone-based leisure may not provide benefits that would lead to a moderating relationship

between stress/anxiety and resilience, or (2) the original scales simply cannot be altered to properly address smartphone-based leisure. The first possible finding is supported by the complex and nuanced smartphone relationships individuals hold. As leisure is generally viewed positively and connected to many positive outcomes (Argyle, 1996; Edginton et al., 2006; Kleiber, 1999; Stebbins, 2018), it makes the moderating of mental health challenges and outcomes direct and simple. However, as relationships with smartphones are more complex and nuanced, smartphone-based leisure may not provide a moderation effect due to the presence of negative smartphone relationships. A similar phenomenon is seen in research exploring social relationships where health outcomes are impacted by the presence of negativity (Brooks & Dunkel Schetter, 2011). This could be due to the *negativity effect*, where negativity can have a greater impact than positivity (Rook, 1984). It could also be an example of an *ambivalent relationship*, where a relationship can hold both high support (or positivity) and negativity at the same time, which has been found to be more detrimental than strictly negative relationships (Uchino et al., 2004). In the case of smartphones, it may be that negative content or experiences overshadow positive ones (i.e., negativity effect), or that smartphone relationships are considered ambivalent as they can be both positive and negative for many people, and therefore impacting its ability to moderate the relationship between mental health and resilience. The second possible finding mentioned above (i.e., leisure coping scales not accurately measure smartphone-based leisure coping) also presents an interesting discussion around smartphone-based leisure and its differences and similarities to other leisure. As the Hierarchical Dimensions of Leisure Stress Coping model was constructed over 20 years ago, it is possible this model simply cannot account for leisure coping that was non-existent at the time, such as smartphone-based leisure coping. In this case, the biggest factor is the social component of leisure and smartphone-based leisure. As

items in the leisure coping scales ask about leisure companions, socialization, and spending leisure time with friends (Iwasaki & Mannell, 2000), it is important to note that companionship, socialization, and the way leisure time is spent with friends is different in smartphone-based leisure (Buote et al., 2009; Mesch & Talmud, 2007; Van Zalk et al., 2014). However, these digital social relationships can still be highly valued and provide social support (Al-Kandari & Al-Sejari, 2020) as well as social capital and subjective well-being (Bae, 2019). Therefore, as mentioned earlier, there is an opportunity for leisure scholars to re-imagine this leisure coping model or the wording of its scales to encapsulate technology-based leisure and its social component.

A final discussion point related to leisure coping is the contrasting perspectives of the coping benefits that smartphones may provide. This study's statistical findings suggest that the majority of students use their smartphones for coping, and more specifically leisure coping. Scores on leisure coping scales demonstrate that students can hold leisure coping beliefs and strategies related to smartphone-based leisure. Students who use their smartphones for coping also had higher scores on the immediate adaptational outcome scales, demonstrating the effectiveness of the coping they are doing using their smartphone. This last component regarding immediate adaptational outcomes is also supported by previous literature explaining that postsecondary students' leisure coping beliefs and strategies are largely connected to coping effectiveness (Iwasaki, 2001). The statistical results demonstrate possible leisure coping benefits of smartphones, and yet students' comments were much more complex and filled with contrasting perspectives. Comments described mixed relationships, how negative relationships could be formed from smartphone use that could be considered leisure (i.e., social media), and that reliance on one's smartphone was not always a good thing. It is important to note that people

can hold contradicting beliefs about a single topic, and this can be because our minds cannot constantly search for and fix all contradictions, in addition to beliefs being contextual (Markman, 2017). In research, this is most often seen in interviews where participants may contradict themselves when explaining their experiences and perspectives (Brinkmann, 2018). It is also possible for students to have changed their perspectives or provided more complex responses throughout the survey as they continued to reflect on their own experiences with smartphones (Yocco, 2018). These contradicting and changing/evolving perspectives are important to acknowledge because one's understanding of a topic is not stagnant; knowledge and perspectives are ever changing and can be different over time, especially when given the opportunity to reflect upon one's thoughts, ideas, values, and experiences.

5.4 Marginalized Populations

As we have talked about smartphone use, coping, and leisure coping, here we discuss how marginalized populations use and connect with their smartphones differently and the contextual factors that may lead to these differences (e.g., mental health). In this study, LGBTQ2SIA+ students had higher perceived stress and feelings of anxiety compared to non-LGBTQ2SIA+ students, supporting previous findings of higher prevalence of mental health challenges among LGBTQ2SIA+ folks (Statistics Canada, 2014). Safety was discussed by one LGBTQ2SIA+ student, describing how their smartphone was a safer space for them to express themselves and their personal or sexual identity. This concept of safety for this population is supported by research exploring the critical role social media play in providing a safe space for LGBTQ2SIA+ individuals to share information and experiences (Duguay, 2016; Kuper &

Mustanski, 2014), access a support system (Baams et al., 2011), and develop their identity (Bates et al., 2020).

Racialized students were more likely to use their smartphone for coping and had higher scores in smartphone-based leisure coping strategies, as well as pre- and post-COVID immediate adaptational outcomes as compared to non-racialized students. These results complement each other and suggest that, not only do racialized students use their smartphone for leisure coping (i.e., leisure coping strategy), but also perceive this coping to be effective. Previous research has also found higher smartphone ownership and time spent on smartphones by African American young adults (Duggan, 2013), and that social interaction anxiety was a significant factor in overuse of certain social media (e.g., Facebook) by African American young adults (Lee, 2015). Safety was also discussed by one or more racialized students in this study, similarly to LGBTQ2SIA+ students. However, there is little research exploring the concept of smartphone use for safety among racialized individuals. It could, however, play a similar role as a safe space for racialized students.

Finally, students living with a disability also had higher perceived stress and feelings of anxiety than non-disabled students, which is also supported by previous findings (Poppen et al., 2016). Students living with a disability were also more likely to use their smartphone for coping compared to non-disabled students. It is important to note that a disability can be physical, cognitive, intellectual, mental health-related, and more. Therefore, it is also possible to have differences in smartphone use between these groups (Johansson et al., 2021). Previous research has found that individuals with disabilities have more difficulty accessing the Internet compared to the general population, but once online, were likely to engage in five activities: downloading videos, playing games, reviewing products of services, sharing own content, and posting to blogs

(Dobransky & Hargittai, 2016). Although there is not much research relating to the use of smartphones for coping among students with a disability, there is a great deal of research regarding the use of smartphones as a tool to access health apps or programs specifically designed for individuals with disabilities (e.g., Bush et al., 2017; Ross et al., 2020; Vansimaeys et al., 2017). These results demonstrate the differing smartphone uses and relationships students from marginalized populations may hold. In addition, the traumatic news and racist events around the world added to the negative impacts on mental health and were accessed via smartphones for many (Nixon et al., 2018). These findings demonstrate the added complexity of smartphone use and smartphone relationships and their connection to mental health among marginalized populations.

5.5 Mental Health, Smartphone Relationships, and Strategies

Although experienced at different levels, mental health challenges in general were not unique to students from marginalized populations. It is concerning to see that 44.4% of students are experiencing moderate to severe anxiety; however this is not uncommon with similar findings being reported elsewhere (American College Health Association, 2019). This study explored the connection between smartphone use and mental health in the hopes to add to the literature related to smartphone use, coping, and mental well-being. Previous literature has often focused on the following questions: 1) Does the use of smartphones lead to poor mental health (Beranuy et al., 2009; Herrero et al., 2019; Murdock, 2013; Park et al., 2010; Pierce, 2009; Reid & Reid, 2007; Sánchez-Martínez & Otero, 2009; Tan et al., 2013; Thomée et al., 2010; Thomée et al., 2011), or 2) does poor mental health lead to the use of smartphones for coping (Deatherage et al., 2014; Nehra et al., 2012; Panova & Lleras, 2016). Instead of answering one question or the

other, the results from this study demonstrated the possibility of both scenarios happening simultaneously. Students' comments demonstrated how mental health can be impacted by smartphone uses such as social media, constant availability, and negative news, but also how many students use their smartphone for leisure coping when experiencing stress and/or anxiety. This bi-directional connection between smartphone use, stress, and coping has been suggested in a recent study on digital companionship, linking companionship components (e.g., closeness, trust, preoccupation) to both positive (coping with stress) and negative (experiencing stress) outcomes of smartphone use (Carolus et al., 2019).

Previous research has suggested that people develop relationships with technology (Carolus et al., 2019; Nass et al., 1996). This study supports this notion as students described their own smartphone relationships and how their smartphone use shaped these relationships. These relationships seemed to also impact students' mental health; students with more positive smartphone relationship could use their smartphone for leisure coping and to connect with others, while students with more negative smartphone relationships would experience more negative outcomes (e.g., stress) from their smartphone use. As mentioned earlier, previous literature has found more negative outcomes related to problematic or overuse (Beranuy et al., 2009; Herrero et al., 2019; Murdock, 2013; Park et al., 2010; Pierce, 2009; Reid & Reid, 2007; Sánchez-Martínez & Otero, 2009; Tan et al., 2013; Thomée et al., 2010; Thomée et al., 2011) while non-problematic or reasonable use led to more positive outcomes (Al-Kandari & Al-Sejari, 2020; Bae, 2019; Carolus et al., 2019; Kil et al., 2021). However, this is not to say that smartphone uses and relationships cannot change, evolve, and be improved. This demonstrates the importance of mindfulness or awareness of one's own use to evaluate their smartphone relationship. Many students demonstrated this mindfulness or awareness by sharing deeply

critical thoughts about their own smartphone use and relationships, as well as sharing descriptions of the strategies implemented by students to maintain or build more positive relationships with their smartphone (Table 4). Some of these strategies have previously been explored for their potential in improving smartphone relationships, especially as it relates to problematic smartphone use: digital detoxes (Schmuck, 2020), setting boundaries (Mellner, 2016), and mindful smartphone use (Bauer et al., 2017). The creation or implementation of these strategies were, in their own way, a form of problem-focused coping, where an individual addresses the problem that is causing distress (Folkman & Lazarus, 1980). In this scenario, students are addressing the stressors experienced through their smartphone use. By doing this, students are demonstrating adaptiveness in high stress situations such as a pandemic, and therefore also demonstrating their resilience (Smith & Carlson, 1997; Thompson et al., 2016). These findings present the importance of reevaluating one's smartphone use and relationship, implementing strategies that work for the individual, and in turn, adjusting or improving one's smartphone use and relationship. This could also present a new opportunity to use one's smartphone for leisure coping and receive more of its benefits due to having fewer negative undertones clouding the leisure coping experience.

A final thought as it relates to smartphone use, smartphone relationships, and leisure coping strategies is the parallels between technology and people. Similarities between human-human and human-automation relationships have previously been explored, such as the similarities regarding trust (Madhavan & Wiegmann, 2007), social rules (Sundar & Nass, 2000), and social bonds (Cassell & Bickmore, 2000; Nass et al., 1999). In the current study, the way students discussed their relationships with their smartphones mirrored how individuals talk about relationships with people, such as the placing of boundaries, avoiding toxicity, and improving

relationships. Similarly to smartphones, not all relationships with people will be positive or negative and can be quite complex and nuanced (Uchino et al., 2004). One can also improve their relationship with a person by employing strategies, often mirroring those discussed in table 4: distancing oneself for a short time (Mark, 2019), placing boundaries (DiveThru, 2020), mindfulness (Bullock, 2021), and avoiding toxicity (Mindful, 2021). Another point is how some students discussed not being able to function or imagine their life without their smartphone. It has been suggested that, because communication and interaction is one of the basic needs or motives of humans, this is one of the main purposes for smartphone use (Leung & Wei, 2000). This motivation for smartphone use is even more pronounced through the COVID-19 pandemic as communication through this type of technology can promote higher perceptions of social support which can then reduce loneliness, boredom, and anger/irritability (Gabbiadini et al., 2020). This is not to say that technology can replace human interaction, but simply to highlight the parallels between how individuals can develop relationships with technology similarly to relationships with people.

5.6 Implications

As individuals can build relationships with their smartphones similarly to people, this also highlights the importance of smartphones in many people's lives. Since smartphones play such large roles for many students, this demonstrates the importance of reevaluating and considering smartphone use and relationships not only in our own everyday lives, but also the lives of students. For healthcare professionals, such as therapeutic recreation (TR) specialists, evaluation or reevaluation of clients' smartphone use, relationships, and leisure could be an important part of practice not only to better understand the meaning a client may ascribe to their

smartphone, but also how their smartphone may play a role in helping or hindering their mental health. In this case, TR specialists could assess, plan, and implement personal care plans focused on improving their clients' smartphone relationships by implementing some of the strategies discussed in this research or personally meaningful strategies for the client. By including this as part of client assessments, TR specialists can also potentially build stronger rapport with clients, demonstrate an understanding of how important one's smartphone is in their lives, and use the smartphone as a therapeutic tool in the hopes of supporting the client and improving their mental health.

In the context of postsecondary institutions, one of the most important implications is understanding the role smartphones play in students' lives. Stringent rules such as not having one's smartphone on their person or punishments for using one's smartphone while in class are not necessarily going to achieve the goal of improving a student's concentration or attention. As students build relationships with their smartphones, being forced to completely disconnect from their smartphone can be uncomfortable. If one's smartphone represents a sense of safety, connection, and leisure coping, being forced to disengage from one's smartphone could be scary, jarring, and anxiety-inducing. Though this study does not focus on or provide tangible pedagogical suggestions, it does provide post-secondary educators with a better understanding of the role smartphones play in their students' lives. Educators may also want to explore the possibility of allowing/encouraging students to use their smartphones in ways that can support their education and learning. For example, certain active learning activities such as polls and technology-based classroom activities now offer the opportunity to participate through either a computer or a smartphone. Many of these active learning activities encourage the use of students' smartphones as a tool for learning and actively participating, and can foster teamwork

and peer-to-peer learning (Holloway et al., 2021). Also, institution-based mental health services could support the use of smartphones for leisure coping and can address this through individualized services or embedded within currently provided mental health and resilience workshops. Therefore, another implication of this research is the possibility of having post-secondary educators and institutions encouraging the use of smartphones in ways that promote using one's smartphone as a tool for education, connecting with others, and leisure coping.

5.7 LIMITATIONS

5.7.1 Survey Limitations

As it relates to the survey itself, there were a couple of limitations to this study. First, quantitative questions regarding time spent on smartphones among participants led to inconsistent and confusing answers where some participants answered as expected (i.e., in total hours) and others responded in minutes or in fractions of their time. These questions were therefore not included in the analysis, though qualitative answers were still relevant. Although not having a significant impact on results, it did remove the opportunity to do statistical analysis regarding smartphone use.

A second limitation related to the survey itself is the accidental priming of answers. As smartphone relationships may not be a common term for participants, the researcher provided example answers as part of the questions, which often led participants to use similar terms in their own answers. For example, a question about smartphone relationships asked students how they perceived their smartphone relationship, with terms like "positive", "negative", and "neutral" as part of the examples. This led to the positive-negative dichotomy which emerged

from the thematic analysis and was used to categorize and explain results as opposed to allowing for a more nuanced and less rigid lens for thinking about smartphone relationships.

Third, as this survey was anonymous, there was no opportunity to ask follow-up questions to participants to gain more insight or elaboration regarding their experiences. This led to some comments being unused in the analysis as they did not answer the question asked or were only comprised of one word. However, the majority of answers provided did have enough content for analysis.

Fourth, this anonymity also did not allow the researcher to confirm that participants did fit the inclusion criteria, such as student status and that they are not a "bot" (i.e., a software application that runs automated tasks over the internet). However, due to the survey being only available through a specific link, and the recruitment strategy of sending the survey link directly to students or through post-secondary institutions, the odds of having participants not fit the inclusion criteria were decreased.

Fifth, also due to the anonymity of the survey, some participants repeated themselves in their responses across different questions. As the analysis was completed using a PDF file of Opinio survey results in NVivo, this makes the identification of the number of participants stating a similar comment very difficult. For example, it is not possible to say exactly how many participants specifically stated that social media is a negative influence in their smartphone relationship.

Sixth, as the survey asked participants to reflect on their smartphone use and relationships retrospectively, this does affect the accuracy of the information provided. However, participants may have also had the opportunity to reflect on their use over time, therefore providing more general and overall descriptions which yielded great "big picture" commentary.

Finally, as the survey was lengthy, the researcher ensured the most important questions were placed early in the survey because, as expected, there was some attrition of participants who did not complete the survey. This may have been due to the length of the survey or the sub-optimal layout of the survey when completed on a smartphone (i.e., required more scrolling and maneuvering to complete the survey on a smartphone than on a computer). Although the demographics of participants who completed the survey compared to those who were included in the analysis were comparable, it is important to recognize that some perspectives may have been lost due to these factors.

5.7.2 Methodological Limitations

There were other limitations related to research methods. In terms of advertising, this study was circulated across five universities in Nova Scotia: Dalhousie University, Acadia University, Saint Mary's University, Cape Breton University, and Mount Saint Vincent University. Although post-secondary students from any institution in Nova Scotia could participate, advertising was focused on these universities to reach a large audience. This does, however, lead to having the majority of participants be university students as opposed to community college or trade students. This could have an impact on results, although the possible impact is unclear. Another limitation in relation to advertising is that, although ethical clearance was received from each of the five universities for advertising purposes, university administration from schools other than the researcher's institution (Dalhousie University) were less likely to share the research advertisements. This may be due to a variety of factors: 1) unsure if they could share the research, 2) home-university bias; they may be less likely to share

research from other universities, or 3) administrative personnel may simply have been too busy to share a research study with students.

A second methodological limitation is the convenience sampling, which limits the generalizability of the results. However, as student mental health, smartphone use, and leisure coping are not limited to Nova Scotia post-secondary students, it is possible for these results to be used as a guide for understanding these topics among post-secondary students across Canada. This limitation to Nova Scotia students was implemented to limit number of other factors that could contribute to the complexity of results that may be caused by living in different areas of Canada. These other factors include, but are not limited to, the continuously changing restrictions and daily habits related to the COVID-19 pandemic, potential differences in mental health supports across Canada, potential differences in student life and social norms in other provinces, and potential differences in leisure habits of students across Canada.

A final methodological limitation is that this survey was circulated in the Fall 2020 semester (September to December), a minimum of six months after the initial onset of the COVID-19 pandemic-related restrictions in Canada (which started in March 2020). This timeline may have impacted results as students' smartphone use and relationships had time to go through a variety of changes. However, participants were able to describe how their use and relationships were impacted by the pandemic both at the initial onset and after time had passed. Although the full extent of the initial impact may not be fully described retrospectively, this also allowed students to reflect on a longer period of time and express their perceived experiences through time.

5.7.3 Other Limitations

Some final limitations related to this study relate to more general concepts. First, it is important to understand that smartphones are not purely used for leisure purposes. Participants in this study also expressed using their smartphone for school, work, and other non-leisure activities. Since smartphone relationships seem to be based on smartphone use, these non-leisure uses also had an impact on smartphone relationships. These other non-leisure uses can blur the lines of smartphone use and also blur the lines regarding relationships with technology as thoughts of other technology, such as computers, could also influence participant answers.

Finally, the Hierarchical Dimensions of Leisure Stress Coping model was described as the main theoretical model of this study. As explained in the discussion, it seems smartphone-based leisure coping does map on to the model, but it is important to recognize that this model was not built with smartphone-based leisure in mind, and therefore has its limitations when it comes to its application in this study. For example, although some participants recognized how smartphone-based leisure could provide a sense of autonomy (as part of the leisure coping beliefs), other participants could not understand the connection to smartphones. This suggests a possible restructuring of the Hierarchical Dimensions of Leisure Stress Coping model to include leisure that was not present or as technologically advanced at the time of its creation.

5.8 Future Studies

This research provided a first look into the use of smartphones for leisure coping among post-secondary students. There are many possible compelling future studies that could continue to explore some of these topics. First, as smartphone use and relationships among individuals from marginalized populations seem to be different in their amount and importance, future

studies could explore smartphone use and relationships among marginalized populations to gain a deeper understanding. This may also uncover how marginalized individuals could be better served in terms of mental health services through smartphone applications. Second, as students may learn about some of these topics (e.g., leisure, technology, mental health) in their academic programs, a future study may explore these topics in relation to students from specific academic programs to explore the influence their program may have on their smartphone use and leisure coping. Third, as some students seem to build more extreme relationships (e.g., extremely positive or negative) with their smartphone, a future study could explore the factors that are involved in building these relationships, such as the age of ownership of first smartphone, their main uses, their perceived importance of smartphone relationship, and their in-depth experiences as they relate to smartphone relationships in their individual lives. Fourth, there may be some interest in understanding why some smartphone-based leisure (e.g., podcasts) provides coping outcomes more than others (e.g., social media). Finally, as students become aware and critically think about their smartphone use and relationship, an intervention study exploring the explicit use of smartphone-based leisure for coping or the implementation of strategies to improve smartphone relationships could be explored in a journaling study where students could reflect on their experiences and perceived outcomes.

5.9 Conclusion

In conclusion, this research has explored post-secondary students' use of smartphones and its relation to leisure coping and mental health, with an early look into the impacts of the COVID-19 pandemic on smartphone use and relationships. Results showed various relationships between an individual's demographics and their mental health, leisure coping, and smartphone

use for coping. Smartphone-based leisure coping has been linked to immediate adaptational outcomes, though not playing a moderating role between mental health challenges and resilience. Finally, student accounts of their smartphone use, smartphone relationships, leisure, and personal experiences with the COVID-19 pandemic demonstrate the nuanced and complex relationships individuals hold with each of these. Overall, it seems many students use their smartphones for leisure coping and that this use can be considered beneficial and effective, and that impacts from the COVID-19 pandemic were short-lived in terms of changes to smartphone use and relationships. This study will help inform future research related to student mental health, smartphone-based leisure, leisure coping, and the COVID-19 pandemic by presenting the possible beneficial outcomes of leisure smartphone use.

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APPENDIX A - RECRUITMENT POSTER

STUDENT SMARTPHONE SURVEY

ARE YOU A POST-SECONDARY STUDENT IN NOVA SCOTIA?

DO YOU OWN A SMARTPHONE?

WE WANT TO HEAR FROM YOU!

The STUDENT SMARTPHONE SURVEY wants to know more about how you use your smartphone and if you think it helps you manage stress!

***This survey is open to all students, including those who identify as part of a marginalized community (e.g., Indigenous, racialized, LGBTQ2SIA+).**

To learn more, follow this link: https://surveys.dal.ca/opinio/s?s=57364
Or email christine.ausman@dal.ca

DALHOUSIE UNIVERSITY

Christine Ausman, CTRS
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APPENDIX B - RECRUITMENT LETTER – PICTURE VERSIONS

APPENDIX C - CONSENT FORM (SURVEY INTRO)

Welcome to the Student Smartphone Survey! Please read the following consent form.

Lead researcher:

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*If you have any questions regarding this study, please email christine.ausman@dal.ca
*If you have any concerns regarding potential ethical issues related to this research, you can contact Dalhousie University's Research Ethics Board at ethics@dal.ca
*This study is not funded or sponsored. There are no conflicts of interest.

Purpose of this study: To determine the role smartphones play as a form of leisure coping among post-secondary students, and how this may have been affected by the COVID-19 pandemic. This study aims to inform student health and wellness services across Nova Scotia regarding the role smartphones can play in student mental health.

Who can take part in this research study? You may participate if:

- You were a **student** at a Nova Scotia post-secondary institution (part-time or full-time) during the **Fall 2019** (September-December, 2019) and **Winter 2020** (January-April, 2020) semesters
- You are **currently** a student at a Nova Scotia post-secondary institution (part-time or full-time)
- You own a **smartphone**

What do I have to do? This **one-time anonymous survey** should take approximately 20-40 minutes, depending on the amount of information you would like to share. It will ask you about your use of your smartphone, stressors, your leisure, coping strategies, smartphone addiction, mental health questionnaires (perceived stress & anxiety), and your resilience. You will also be asked about your perceptions regarding COVID-19 impacts on these different topics. These are part of data collected as the researcher is exploring if students use their phones as a form of leisure coping and if this has been impacted by COVID-19. You are asked to answer honestly and as accurately as possible.

Who is going to see my data? Only the lead researcher and her supervisors (listed above) will have access to raw data.

What are you going to do with my data? Results are part of the lead researcher's MA Leisure Studies thesis. Results will be analyzed and discussed in the lead researcher's final thesis and will be submitted for publication in research journals. Results will also be presented in regional, national, and/or international conferences. Finally, results will also be kept for up to 5 years in password protected files within a password protected computer owned by the lead researcher for possible secondary analysis in future research projects. All raw data will be deleted/destroyed after this 5-year period.

How will my information be protected? All information you share will be kept anonymous and cannot be traced back to you. It is up to you as to what information, and how much information, you provide. We recommend that you try to avoid sharing any identifiable information (e.g., names, addresses, specifics that can be traced back to you) in order to keep your data anonymous. If you accidently share any identifiable details (e.g., names, locations), this information will be omitted when sharing results. All your personal information will be kept private and confidential. Information will be stored in a password-protected, encrypted file on the researcher's personal computer. All data is stored in Canada and meets requirements set by the Canadian information privacy and confidentiality legislation.

Possible benefits, risks and discomforts: We expect minimal benefits, risks, or discomfort for participants. For some, the opportunity to participate is a way to contribute knowledge, which may help others. At the same time, as topics of COVID-19 and mental health may bring about emotional discomfort, Nova Scotia specific mental health resources will be provided at the end of the survey. Please note, if you are completing this survey on a mobile phone, any data charges will be the responsibility of the participant and not the responsibility of researchers.

What if I want to stop participating? You are under no obligation to participate, and you are free to exit the survey at any point without any prejudice to pre-existing entitlements. Descriptions of topics and questions will be available on each page, and you will have the choice to leave the survey at any time, including after having read or started questions. However, any information you have shared up until you withdraw will be part of data analysis as anonymous data cannot be identified for the purposes of removal.

Do I get anything for participating? As a thank you for your time, at the end of the survey there will be a link to a separate survey where you can enter your email for a **chance to win 1 of 3 $50 electronic gift cards to the local business of your choice**. You will also be asked if you would like to receive a copy of preliminary results of this study and if you would like to be contacted for any future related studies. The separation of surveys allows for your personal information to stay separated, leaving your survey responses anonymous. Your email will be kept confidential on a password protected computer, and will be permanently deleted after

preliminary results have been shared (Summer 2021). The gift card draw will take place in January 2021. Also, throughout and at the end of the survey, a list of Nova Scotia mental health resources will also be made available. There will also be a link to a helpful guide related to smartphone addiction.

Will I see results? Preliminary results will be made into an info-graphic and distributed to the post-secondary institutions who assisted in advertising, who in turn will share with students. If you do not receive results in this way, the info-graphic will also be made available on Dalhousie University's School of Health and Human Performance webpage. Finally, if you choose to submit your email in the draw, you will also be asked if you would like to have preliminary results sent to the email you provide.

Alright, I want to participate! If you would like to continue with participation, please read the following carefully:

I have read the explanation about this study and I agree to take part in this study. I understand that I am free to exit the survey at any point, but that any information provided up until that point will be included in the data analysis. I understand that by giving consent, I give permission for the researcher to use direct quotations of information that I provide when they present the results, while maintaining confidentiality. I understand that by giving consent, my data will be saved for up to 5 years and will be destroyed after this period. And I understand that by giving consent, I am waiving any rights to legal recourse in the event of research-related harm.

Please select one of the following. If you agree with the above and consent to participate in the study, please select the "I consent to the above" box, then click "start" to begin the survey. This will serve as your official consent for participation. **If you do not consent**, please click "I do not consent to the above" or you may exit the survey now.

- ☐ I consent to the above
- ☐ I do not consent to the above

APPENDIX D - SURVEY OUTLINE

Consent Form Page

- APPENDIX C; which is Question 1 in the survey report

Thank you for participating in our study! This survey should take between 20-40 minutes, depending on how much you would like to share. As this survey will discuss topics related to mental health and COVID-19, mental health resources will be provided throughout (link to mental health resources) and at the end of the survey. Also, in order to be entered into the draw for a chance to win 1 of 3 $50 electronic gift cards to the location of your choice, there will be a new survey link available at the end of this survey for you to enter your email and have this information separate from your survey responses, ensuring anonymity of survey responses.

Although we encourage you to answer all questions, you have the option to not answer a question if you don't feel comfortable. Reminder, you will be able to exit the survey at any point by clicking the "Exit" button.

We would like to start off with some demographic questions.

2. Age: __ (open box, numerical entry)
3. Gender: I identify as (e.g., female, male, non-binary, prefer not to say): _____ (open box, will code as female, male, LGBTQ2SIA+ for analysis)
4. Do you identify as being part of any of the following populations? Select all that apply. (multiple choice, can answer more than one)
    a. LGBTQ2SIA+
    b. Heterosexual
    c. Black
    d. White
    e. Latinx
    f. Asian
    g. Indigenous
    h. Living with a disability (not related to mental illness)
    i. Diagnosed with a mental illness (**not** receiving treatment)
    j. Diagnosed with a mental illness (**and** receiving treatment)
    k. Other: _____

LINK FOR MENTAL HEALTH RESOURCES

Questions about your living situation

5. Where are you currently living? (multiple choice, only one answer)
    a. Nova Scotia
    b. Elsewhere in Canada
    c. Another country
6. Do you live alone or with others? (multiple choice, only one answer)

a. Alone
b. With one other person
c. With two or more other people

LINK FOR MENTAL HEALTH RESOURCES

Questions about school

7. Which post-secondary institution are you attending? (drop down menu of NS institutions)
    a. Acadia Divinity College
    b. Acadia University
    c. Atlantic School of Theology
    d. Canadian Coast Guard College
    e. Cape Breton University
    f. Dalhousie University
    g. Mount Saint Vincent University
    h. Nova Scotia Agricultural College
    i. Nova Scotia Community College
    j. NSCAD University
    k. Saint Mary's University
    l. St. Francis Xavier University
    m. Université Sainte-Anne
    n. University of King's College
    o. Not on this list: (open box)
8. Are you a full-time or part-time student? (multiple choice, only one answer)
    a. Full-time
    b. Part-time
9. Are you an undergraduate or graduate student? (multiple choice, only one answer)
    a. Diploma/certificate program student
    b. Undergraduate student
    c. Graduate student
    d. Other description: (open box)
10. What is your main area of study? (multiple choice, only one answer)
    a. Agriculture
    b. Architecture and Planning
    c. Arts and Social Sciences
    d. Business
    e. Computer Science
    f. Dentistry
    g. Education
    h. Engineering
    i. Environmental Studies
    j. Health
    k. Law
    l. Management
    m. Medicine

n. Nursing
o. Occupational Therapy
p. Physiotherapy
q. Recreation, Leisure, Sport, or Tourism
r. Science
s. Speech-Language Pathology & Audiology
t. Not part of this list
    i. (open box)

LINK FOR MENTAL HEALTH RESOURCES

Leisure is defined as "enjoyable free time activities". Examples can include: arts, sports, reading, baking/cooking, outdoor activities, etc.

11. What are some examples of leisure in your life? (open box)
12. How do YOU think about, or value leisure? E.g., Is leisure important to you? What role does leisure play in your life? (open box)

LINK FOR MENTAL HEALTH RESOURCES

13. How would you describe your overall relationship with your smartphone? (e.g., positive/negative/neutral; What is it used for? Is your phone something you can be without? Your need/reliance on your phone) Please give as much detail as you would like. (open box)
14. Do you perceive your relationship with your smartphone to have changed due to COVID-19? (i.e., Do you rely on it more/less? Does it play a bigger/smaller role? Do you have more negative/positive feelings about your smartphone now) (Yes/No) If yes, please explain: (open box)

LINK FOR MENTAL HEALTH RESOURCES

The following section is about your current use of your smartphone. It may be difficult to be exact, but we simply ask that you give us your best approximations. If it helps, you may be able to use the Settings section of your phone to help you answer.

15. How much time would you typically spend on your smartphone per day? (in hours, decimals allowed)
16. Of this average total daily time spent on your smartphone, how much would you say is spent on **obligations** (e.g., work, school, responsibilities)? (in hours, decimals allowed)
17. Of this average total daily time spent on your smartphone, how much would you say is spent on **leisure** (e.g., social media, listening to music, watching videos/streaming services, playing games, communicating with friends/family)? (in hours, decimals allowed)
18. Of this average total daily time spent on your smartphone, how much would you say is spent on **other personal use** (i.e., anything that wasn't in 'obligations' or 'leisure')? (in hours, decimals allowed)

19. In general, would you say your **time** spent on your phone and/or **what you do** on your phone has been impacted by COVID-19? (Yes/No) If yes, how so? (open box)

LINK FOR MENTAL HEALTH RESOURCES

*Section received if answer to Q16 is >0.

You answered that some of your time spent on your phone is for leisure. Thinking only about the leisure you experience/access through your smartphone, please answer the following questions:

20. On an average day, how much of your leisure smartphone time (in hours) is spent on **texting, calling, or otherwise communicating with others?** (in hours, decimals allowed)
21. On an average day, how much of your leisure smartphone time (in hours) is spent on **websites and internet?** (in hours, decimals allowed)
22. On an average day, how much of your leisure smartphone time (in hours) is spent on **email?** (in hours, decimals allowed)
23. On an average day, how much of your leisure smartphone time (in hours) is spent on **social media (e.g., Facebook, Instagram, Twitter, Snapchat, Tik Tok, etc.)?** (in hours, decimals allowed)
24. On an average day, how much of your leisure smartphone time (in hours) is spent on **entertainment (e.g., Netflix, YouTube)?** (in hours, decimals allowed)
25. On an average day, how much of your leisure smartphone time (in hours) is spent on **photos and videos (including taking, browsing, and editing)?** (in hours, decimals allowed)
26. On an average day, how much of your leisure smartphone time (in hours) is spent on **health-related apps (e.g., health app, fitness or nutrition apps, health trackers, mental health apps, meditation)?** (in hours, decimals allowed)
27. On an average day, how much of your leisure smartphone time (in hours) is spent on **productivity tools (e.g., notes, timer)?** (in hours, decimals allowed)
28. On an average day, how much of your leisure smartphone time (in hours) is spent on **games?** (in hours, decimals allowed)
29. On an average day, how much of your leisure smartphone time (in hours) is spent on **music?** (in hours, decimals allowed)
30. On an average day, how much of your leisure smartphone time (in hours) is spent on **reading (e.g., eBooks, news, magazines, blogs)?** (in hours, decimals allowed)
31. Are there any categories we've missed? If so, on an average day, how much of your leisure smartphone time (in hours) is spent on this category, and please identify below the category we've missed. (If no other categories, please leave blank). (in hours, decimals allowed) (open box for category name)

LINK FOR MENTAL HEALTH RESOURCES

The following questions will be asking you about stressors and causes of feelings of anxiety.

***Stressors* are things that you perceive are causing you stress.**

Feelings of anxiety **include tension, fear, worry, or feeling that something is not going well.**

32. What are major stressors or causes of feelings of anxiety that you experience? (You can provide as many examples or explanations as you want) (open box)
33. Do you perceive these stressors/causes of feelings of anxiety have changed or been impacted by COVID-19? (e.g., are they the same/different than before COVID-19? Are there more/less? Are they affecting you more/less?) (Yes/No) If yes, how so? (open box)

LINK FOR MENTAL HEALTH RESOURCES

The following section is about the use of your phone for coping.
Coping **is defined as "thoughts and behaviours used to manage stress".**

34. Do you use your smartphone for coping? (i.e., does your smartphone help you manage/deal with stress?) (Yes/No) If yes, please tell us how (open box)

LINK FOR MENTAL HEALTH RESOURCES

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*Section received if answer to Q16 is >0.
Thinking of leisure you access/experience through your phone ("smartphone-related leisure"), please answer these questions to the best of your ability.

Leisure Coping Beliefs Scale (short-form) – answers 1-very strongly disagree; 2-strongly disagree; 3-disagree; 4-neutral; 5-agree; 6-strongly agree; 7-very strongly agree; Not applicable

35. Smartphone-related leisure provides opportunities to regain a sense of freedom.
36. My smartphone-related leisure involvements strengthen my ability to better manage stress.
37. I gain feelings of personal control in smartphone-related leisure.
38. Smartphone-related leisure contributes to giving me energy to better cope with stress.
39. If I need extra hands for doing tasks, I can turn to my smartphone-related leisure companions.
40. Smartphone-related leisure is a self-determined activity for me.
41. My smartphone-related leisure companions give me advice when I am in trouble.
42. The things I do in my smartphone-related leisure help me gain confidence.
43. I feel that I'm valued by my smartphone-related leisure companions.
44. My smartphone-related leisure pursuits are freely chosen.
45. My smartphone-related leisure participation allows me to feel energetic to better deal with stress.
46. I feel emotionally supported by my smartphone-related leisure companions.

Leisure Coping Strategies Scale (short-form) - answers 1-very strongly disagree; 2-strongly disagree; 3-disagree; 4-neutral; 5-agree; 6-strongly agree; 7-very strongly agree; Not applicable

47. My smartphone-related leisure helps me feel better.
48. Escape through smartphone-related leisure is a way of coping with stress.
49. Socializing in smartphone-related leisure is a means of managing stress.
50. I gain a positive feeling from smartphone-related leisure.

51. Spending smartphone-related leisure time with my friends helps me better deal with stress.
52. Engagement in smartphone-related leisure allows me to gain a fresh perspective to better cope with stress.
53. Smartphone-related leisure helps me manage negative feelings.
54. Smartphone-related leisure provides me an opportunity to gain renewed energy to better deal with stress.
55. Engaging in social smartphone-related leisure is a stress-coping strategy for me.

LINK FOR MENTAL HEALTH RESOURCES

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56. Has your use of your smartphone **for coping** changed due to COVID-19? (i.e., ways in which you're using it for coping; how much you're using it for coping) (Yes/No) If yes, how so? (open box) *Question received if answered "yes" to Q33
57. What other coping strategies do you typically use? **AND** have these changed/been impacted by COVID-19? (open box)

LINK FOR MENTAL HEALTH RESOURCES

We want to know how effective you perceive the use of your smartphone to be in helping you cope right away, in the moment.

Thinking back to Fall 2019, before COVID-19:

IMMEDIATE ADAPTATIONAL OUTCOME SCALE – answers range: 1 – not at all; 2 – a little; 3 – moderately; 4 – quite a bit; 5 - extremely

58. Using my smartphone was an effective way for me to manage my stress
59. Using my smartphone helped me feel better able to manage my stress
60. Using my smartphone helped me reduce my stress

Considering your current situation:

IMMEDIATE ADAPTATIONAL OUTCOME SCALE – answers range: 1 – not at all; 2 – a little; 3 – moderately; 4 – quite a bit; 5 - extremely

61. Using my smartphone is an effective way for me to manage my stress
62. Using my smartphone helps me feel better able to manage my stress
63. Using my smartphone helps me reduce my stress

64. In your own words, how does your smartphone help you cope right away, in the moment? (open box)

LINK FOR MENTAL HEALTH RESOURCES

The following section is about smartphone addiction. Smartphone addiction is characterized through negative outcomes in the following parts of life:

- **Daily life disturbances** caused by smartphone usage (e.g., missing planned work, difficulty concentrating, experiencing light-headedness or blurry vision, pain in write or back of neck, feeling tired or lacking adequate sleep)
- **Positive anticipation** (e.g., feeling calm/cozy, pleasant/excited, confident while using my smartphone; being able to get rid of stress; nothing fun to do other than use my smartphone; I would be empty without my smartphone; using my smartphone is most fun thing to do)
- **Withdrawal** (not wanting to be without my smartphone; negative feelings when I don't have my smartphone)
- **Cyberspace oriented relationship** (positive relationships with people through my smartphone, preferring to talk to people through my smartphone than in real life)
- **Overuse** (full battery doesn't last a full day; using it longer than intended; feeling the urge to use it right after having stopped using it)
- **Tolerance** (trying to reduce my use and failing; people think I use my smartphone too much; always thinking about how I want to reduce my use of my smartphone)

65. Would you consider yourself addicted to your smartphone? (Yes/No)
66. Would you consider your smartphone use to be a **problem or as having negative impacts** on your life? (Yes/No)
67. Please provide any explanations, descriptions, or examples to support your answers. (open box)

Helpful guide including information and tips around smartphone addiction:

https://www.helpguide.org/articles/addictions/smartphone-addiction.htm

LINK FOR MENTAL HEALTH RESOURCES

The following questions are about perceived stress you may have experienced.

The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way; rather indicate the alternative that seems like a reasonable estimate.

PERCEIVED STRESS SCALE – answers range from 0 – never; 1 – almost never; 2 – sometimes; 3 – fairly often; 4 – very often

In the last <u>month</u>:

68. How often have you been upset because of something that happened unexpectedly?
69. How often have you felt that you were unable to control the important things in your life?
70. How often have you felt nervous and stressed?
71. How often have you felt confident about your ability to handle your personal problems?
72. How often have you felt that things were going your way?

73. How often have you found that you could not cope with all the things that you had to do?
74. How often have you been able to control irritations in your life?
75. How often have you felt that you were on top of things?
76. How often have you been angered because of things that happened that were outside of your control?
77. How often have you felt difficulties were piling up so high that you could not overcome them?

LINK FOR MENTAL HEALTH RESOURCES

The following questions are about feelings of anxiety you may have experienced. Over the last two weeks, how often have you been bothered by the following problems?

GENERALIZED ANXIETY DISORDERS SCALE – answers range, 0 – not at all sure; 1 – several days; 2 – over half the days; 3 – nearly every day

78. Feeling nervous, anxious, or on edge
79. Not being able to stop or control worrying
80. Worrying too much about different things
81. Trouble relaxing
82. Being so restless that it's hard to sit still
83. Becoming easily annoyed or irritable
84. Feeling afraid as if something awful might happen

LINK FOR MENTAL HEALTH RESOURCES

The following questions relate back to resilience (i.e., bouncing back from stressful events). Please rate the following.

BRIEF RESILIENCE SCALE – answers range, 1 – strongly disagree; 2 – disagree; 3 – neutral; 4 – agree; 5 – strongly agree

85. I tend to bounce back quickly after hard times
86. I have a hard time making it through stressful events (reverse coded)
87. It does not take me long to recover from a stressful event
88. It is hard for me to snap back when something bad happens (reverse coded)
89. I usually come through difficult times with little trouble
90. I tend to take a long time to get over set-backs in my life (reverse coded)

LINK FOR MENTAL HEALTH RESOURCES

If you have any final comments, please feel free to write them here. (open box)

LINK FOR MENTAL HEALTH RESOURCES

Thank you for completing the survey!

If you would like to be entered into the draw to win 1 of 3 $50 electronic gift cards to the location of your choice, please click the following link or copy & paste this link into a tab/window. https://surveys.dal.ca/opinio/s?s=57369

Below you will find a variety of mental health resources. One you are finished, please click "Finish" to submit your survey answers.

Nova Scotia Mental Health Website Institution-specific student health links. If your institution is not listed, we recommend you contact your institution for more information on student health and wellness services.

Acadia University: https://www2.acadiau.ca/student-life/health-wellness/clinic.html

Cape Breton University: https://www.cbu.ca/current-students/student-services/health-wellness/health-services-max-bell-health-centre/

Dalhousie University: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-healthand-wellness.html

Mount Saint Vincent University: https://www.msvu.ca/campus-life/health-wellnessservices/

Nova Scotia Community College: https://www.nscc.ca/services/counselling-wellness/index.asp

NSCAD: https://navigator.nscad.ca/wordpress/wellness/

Saint Mary's University: https://smu.ca/campuslife/the-counselling-centre.html

St. Francis Xavier University: https://www2.mystfx.ca/health-andcounselling/

Université Sainte Anne: https://www.usainteanne.ca/service-de-conseils

Nova Scotia Mental Health Resources

Mental Health Mobile Crisis Team (provides intervention and short-term crisis management): (902) 429-8167 or 1-888-429-8167

Nova Scotia Health Authority & IWK Mental Health & Addictions Intake Line: (902) 424-8866 or 1-866-340-6700 (Toll-free)

Nova Scotia Government list of resources across the province: www.novascotia.ca/help

Regional Supports

ANNAPOLIS VALLEY

Annapolis Valley Health Authority, Mental Health & Addiction Services: 1.855.273.7110
Mental Health Services Kentville: 902.679.2567 ext. 2870
Mental Health Services Middleton: .902.825.4825
Mental Health Services Berwick: 902.583.3111 Ext. 143
CMHA Annapolis County Branch: 902.665.4801
CMHA Kings County Branch: 902.679.7464

CAPE BRETON

CMHA Cape Breton Branch: 902.567.7905
Emergency Crisis Services: 902.567.8000
Adult Outpatient Services: 902.567.7730
Inverness Mental Health Clinic: 902.258.2100
Seniors Mental Health Program: 902.567.7730
Adult Services: 902.667.7951
Child and Adolescent Services: 902.567.7731

COLCHESTER-EAST HANTS

Mental Health Services: 902.896.2606 or 1.844.855.6688
CMHA Colchester/East Hants Branch: 902.895.4211

CUMBERLAND

Mental Health Services: 902.667.3879 or 1.844.855.6688

GUYSBOROUGH, ANTIGONISH, STRAIT

Mental Health Services: 1.888.291.3535

HALIFAX REGIONAL MUNICIPALITY

Healthy Minds Navigator
A health care cooperative providing a variety of peer-based services to people living with mental illness and their families, including assistance with navigating the mental health system. www.healthyminds.ca 902.404.3504

Community Mental Health Clinics are staffed by a team of professionals who provide a range of services to help people manage their mental illness and improve their mental health. Services are available at no cost to adults:

Bayer's Road Community Mental Health: 902.454.1400

Bedford/Sackville Community Mental Health: 902.865.3663

Cole Harbour/Eastern HRM Community Mental Health: 902.434.3263

Dartmouth Community Mental Health: 902.466.1830

West Hants Community Mental Health: 902.792.2042

Addiction Services: 1.866.340.6700

Mental Health Services: 1.888.429.8167

PICTOU COUNTY

Mental Health Services: 1.844.855.6688

Pictou County Health Authority, Child, Adolescent Mental Health Services: 902.755.1137

CMHA Pictou Branch: 902.752.5578

SOUTH WEST NOVA

Mental Health Services 1.844.380.4324

Mental Health Services Yarmouth: 902.742.4222

Mental Health Services Shelburne: 902.875.4200

Mental Health Services Digby: 902.245.4709

CMHA Yarmouth, Digby, Shelburne Branch: 902.742.0222

SOUTH SHORE

Mental Health Services: 1.877.334.3431

CMHA Lunenburg County Chapter: 902.543.7082

Thank you for completing this survey.

APPENDIX E - REMUNERATION SURVEY

1. If you would like to be entered into a draw for a chance to win 1 of 3 $50 electronic gift cards to the location of your choice, please enter your email address below. This email submission is not connected to your survey responses in any way. (open box)
2. Would you like to have preliminary results of this study sent to the email you've submitted above?
   - ☐ Yes
   - ☐ No
3. Would you like researchers to save your email and contact you for potential future related studies?
   - ☐ Yes
   - ☐ No

APPENDIX F - THESIS CODEBOOK

Research Questions:
3. Are post-secondary students using smartphones as a form of leisure coping, and has this been changed by COVID-19?
4. How are post-secondary students using their phones and has this changed due to COVID-19?
5. Has the COVID-19 pandemic changed the relationship between students and their smartphones?

Category	Code	Research Question	Operational Definitions
Leisure Coping Beliefs (LCB)	LCB	Q3	An individual's general beliefs regarding how leisure (including smartphone related leisure) helps them cope with stress
Leisure Coping Strategies (LCS)	LCS	Q3	Descriptions of actual behaviours or strategies implemented for coping that relates to leisure in some way
Phone use (PU)	General Phone Use (GPU) Pre-COVID (PU1) Post-COVID (PU2)	Q4	Phone Use: phone use described but the timeline is not identified explicitly Pre-COVID: referring to any phone use explicitly before COVID Post-COVID: referring to any phone use explicitly after COVID
Phone relationship (PR)	Positive (PR+) Negative (PR-) Mixed (PRM)	Q5	Positive: referring to a positive relationship with one's phone, often through explicit mention/descriptions Mixed: if it is described as both positive and negative Negative: referring to a negative relationship with one's phone, often through explicit mention/descriptions
COVID impacts (CI)	CI on leisure or leisure coping • Modification or change in leisure • No change or neutral • On leisure – negative • On leisure - positive	Q3	CI on leisure/leisure coping: referring to any impacts of COVID-19 on leisure or leisure coping efforts • Positive: if explicitly described as a positive impact on leisure/leisure coping • Negative: if explicitly described as a negative impact on leisure/leisure coping • Modification or change: if impact led to adaptive strategies or change in participation • No change or neutral: no change or outcomes that are neither positive or negative

	CI on smartphone relationships CI on life	Q5	CI on smartphone relationship: referring to any impacts of COVID-19 on phone relationship CI on life: referring to any impacts of COVID-19 on life (e.g., on stressors they experience)