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Adolescent Social Media Use During COVID-19 Isolation and Subsequent Loneliness, Anxiety, and Depression

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Walden University
2025

Abstract

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by

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MS, Walden University, 2018

BA, Lethbridge College, 2012

Dissertation Submitted in Partial Fulfillment

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Developmental Psychology

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Abstract

Throughout the COVID-19 pandemic, adolescents spent time in social isolation from their peers due to periods of mandated lockdown. It was unclear how social media use during lockdown could have influenced adolescents' mental health after the pandemic. Psychosocial development theory and self-socialization theory formed the theoretical framework for this study. This study examined 158 adolescents aged 13-17 who experienced lockdowns and movement restrictions during the COVID-19 pandemic. The independent variables were a) the social media sites most frequented during lockdowns, and b) the purposes of their use. The RCADS and the UCLA Loneliness Scale provided participants' levels of anxiety, depression, and loneliness (DVs). Nonparametric analyses revealed there were no relationships between social media sites used and the purposes of their use, and levels of loneliness. Relationships were found between social media use and anxiety, as well as between purposes of social media use and anxiety and depression. These results fell in line with past research, which indicated that social media use puts adolescents at higher risk of mental health concerns such as anxiety and depression. Post hoc results were hampered by a high number of comparison groups. However, escaping life was a key reason for social media use among those with the highest anxiety and depression scores. Finding humor and entertainment were listed by those with the lowest anxiety scores; connecting with others was listed by those with the lowest depression scores. Implications for positive social change include understanding the use of social media during periods of enforced isolation and how programs and supports can be developed to reduce risk factors associated with social media use.

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Dedication

This dissertation project would not have been possible without the support of my husband Neil. His encouragement and jokes to others about being married to "an almost Dr." over the past few years has kept up my spirits and kept me moving forward in this journey. My kids have had to put up with me for the past 6 years, seeing me in my home office yelling at the computer.

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Chapter 1: Introduction

Introduction

Since March of 2020, COVID-19 has changed how people communicate and interact with each other. Businesses were closed and schools moved to online learning. Community activities and events were stopped and isolation methods to stop the spread of the virus became commonplace (Park et al., 2021). Isolation methods forced adolescents to change how they maintained their social relationships with friends and family as well as participating in school and extracurricular activities. Due to a lack of face-to-face interactions with peers there was a need to find a new way to maintain current relationships and develop new ones (Balanza´–Martı´nez et al., 2020). Due to public health policies and lockdowns adolescents were forced to change their ways of communicating with peers during COVID-19.

Socialization generally occurs within the home, in school and within the activities and events that adolescents participate in within their communities. It is within these social environments that adolescents can develop and maintain healthy relationships with peers and family which leads to healthy social development (Park et al., 2021). There are times that an event occurs in which socialization is challenged due to an inability to connect directly with others in person. When adolescents are unable to connect with others and have healthy and active relationships there is a higher risk of them developing mental health conditions such as depression and anxiety in their teen years and these can continue into adulthood (Orben et al., 2020). If socialization is no longer possible through face-to-face contact, then finding new ways to communicate with others is valuable in ensuring that these relationships with peers and family can continue to be maintained.

Finding new ways for adolescents to stay connected when forced into isolation, as happened during periods of the COVID-19 pandemic, is important to help prevent loneliness. Loneliness leads to an increased risk for mental health conditions such as anxiety and depression (Erzen & Çikrikci, 2018). Loneliness has been found to be highly prevalent in adolescents with 70% of adolescents experiencing loneliness by the age of 18 (Goosby et al., 2013) and more current research is showing that adolescent loneliness is increasing around the world (Twenge et al., 2021). Given that many adolescents are already having periods of loneliness when peer interaction is readily available, finding ways for them to continue remaining connected with others during periods of forced isolation is important to reduce the already present risk factors for increased mental health problems.

Adolescents access social media and online tools that allow them to connect with others, connect with new people from all over the world and express themselves to their peer groups. Digital technology including cellular phones and the internet allow adolescents to be able to connect with others despite enforced social isolation (Christofferson, 2016). Social media can help individuals maintain as well as expand their social network (Kapoor et al., 2018). It is within this use of online connection and socialization that adolescents can remain connected with loved ones and their peers and not miss out on valuable socialization and healthy social development despite the isolation measures associated with COVID-19 prevention.

I have completed a quantitative quasi-experimental research study to determine if the use of social media during COVID-19 lockdowns influenced adolescents' current levels of loneliness, depression, and anxiety. Understanding if social media can have a positive role in adolescent socialization during a period of forced isolation and subsequently impact adolescent mental health allows clinicians to understand how to intervene if adolescents are placed into a period of forced isolation.

Chapter 1 begins with an overview of the background information that supports the relevance and necessity of the study. In Chapter 1, I review what social isolation is and its impact on adolescents, as well as potential subsequent mental health consequences for adolescents. I also discuss the advances of social media use by adolescents and how this is now part of social development for adolescents and how social development theories are changing to meet this new form of communication for adolescents. Chapter 1 has the problem statement as well as the purpose of the study and research questions and hypothesis. Chapter 1 looks at the theoretical framework as well as the nature of this study, the definitions that are applicable as well as the assumptions, the scope and delimitations, limitations and the significance of the study.

Background

Researchers have reviewed the impacts of isolation on adolescents in the past and the impact that this has on social development, and mental health. For example, Banerjee and Rai (2020) showed that isolation is linked to negative health outcomes for adolescents including elevated levels of depression, physical health issues, risk of substance abuse and suicidality. Research has also indicated that these changes in mental health problems and risky behaviors can continue well after a period of isolation has passed (Loades et al., 2020). COVID-19 has forced adolescents to live in isolation from their peers, and community connections.

Globally, individuals have been forced into periods of isolation and movement restriction due to COVID-19. Since March of 2020 in an effort to slow the spread of COVID-19, medical professionals have recommended people remain at least six feet apart from each other, wear masks and restrict activities that encourage large groups of people to congregate. (Centers for Disease Control, 2021). During isolation and movement restrictions it has been difficult for adolescents to have access to their social group and activities. Isolation due to the COVID-19 pandemic has raised concerns that there would be an increase in adolescents experiencing anxiety and depression as the result of isolation and loneliness (Pietrabissa & Simpson, 2020). This concern for adolescent development and potential for an increase in mental health concerns has created the need for adolescents to look for ways to stay connected with peers and continue to have relationships with others.

Adolescents' social development relies heavily on interaction with peers for healthy psychosocial development. Social media networking was one way for adolescents to continue their contact with peers despite being physically isolated, and thus continue the social connection that is important for healthy social development and positive mental health. Social media use has become a more common way for adolescents to be socially connected with others and find a variety of ente rtainment and cultural activities to watch and participate in (Plaisime et al., 2020). Social media use has also given adolescents a place to continue to grow and develop their own self-identity (Anderson & McCabe, 2012). Entertainment is offered on social media and is seen as a way for the user to relax and spend their leisure time. Social media allows users to break borders and access entertainment from around the world and experience a variety of genres (Ojomo & Sodeinde, 2021). Although social media can offer a positive and supportive environment for adolescents, there are risk factors attached to social media use by adolescents that can lead to mental health concerns for some.

Although social media can be a positive experience for many users' concerns have been raised with excessive use by adolescents and how this can be damaging to their mental health. Adolescents can show symptoms of addiction to internet use that are similar to traditional substance use disorders (Peris et al., 2020). Peris et al. (2020) noted that there is a connection between individuals with poor body self esteem and those who spend high amounts of time on social media. High levels of social media use are linked with depression in adolescents (Liu et al., 2022). Studies showed that there is a risk to adolescent's mental health, as well as the potential for addictive like behaviour when social media is used in excess.

Gaps in the research appear with respect to adolescents using social media to connect with peers in times of isolation. Although research has indicated both positive and negative impacts of social media use for adolescents there does not appear to be any research that is specific to social media use during periods of worldwide forced isolation. This gap in research is worth exploring given that from March of 2020 to April of 2022, adolescents spent a great deal of time in isolation from peers. Forced isolation was deemed necessary by various health organizations to prevent the spread of COVID-19 (Chouker & Stahn, 2020). However, during this period adolescents were unable to participate in the types of relationships that are valuable to ensuring healthy social development. Whether or not the use of social media during this period of forced isolation was valuable has yet to be explored with empirical research. There are two possible outcomes that exist; the first is that increased use of social media would have a positive impact on current mental health of adolescents. A second outcome is that the increased use of social media during COVID-19 lockdown was supported by research indicating the negative impact of increased social media use on adolescents' mental health. COVID-19 has been a unique situation in which adolescents have been required to increase the time they spend online to continue their studies in school and continue relationships with family and peers. There is a need for research to examine whether increased use of social media during COVID-19 social isolation had beneficial or negative influences on adolescent mental health.

Problem Statement

Previous research has shown that social relationships with peers are needed for healthy adolescent social development. Developing loneliness as the result of increased isolation can result in higher levels of depression in the future, and research shows that for some this depression can be seen as long as 8 years post isolation (Loades et al., 2020). When adolescents are unable to establish or maintain social relationships there is a risk of adolescents becoming lonely and developing high levels of anxiety, depression and lower cognitive functioning (Ciampo & Ciampo, 2021). Additionally, adolescents who experience social isolation are more likely than adults to encounter difficulties in establishing healthy relationships as adults (Spies Shapiro & Margolin, 2014). There is a need to find new ways for adolescents to explore peer relationships that do not require face-to-face interaction as this is not always possible.

Social media use can offer a way for adolescents to remain connected with peers during periods of isolation. This online connection can allow continued development of healthy social communication skills and reduce risks of mental health concerns and future adult relationship dysfunction (Kapoor et al., 2018). Increased or excessive use of social media by adolescents has been found to have deleterious effects on their mental health (Pantic, 2014). Research conducted in the area of risk factors for adolescents who spend a great deal of time on social media use confirms an increased risk to mental health (Christofferson, 2016) as well as higher risk of substance abuse, self-harm behavior, and the sharing of sexual content (Vente et al., 2020). From the current body of literature, it is unclear whether an increase in social media use by adolescents during a time of social isolation can be harmful to or beneficial for adolescent mental health (Orben et al., 2020).

I addressed this research gap with my study by examining how adolescents' use of social media during COVID-19 periods of forced isolation and movement restriction has affected their current levels of anxiety, depression, and loneliness.

Purpose of the Study

The purpose of this quantitative study was to understand how social media use during periods of COVID-19 lockdown has impacted adolescents' current levels of loneliness, depression, and anxiety. The study has three dependent variables: current levels of a) loneliness, b) depression, and c) anxiety. The two independent variables examined were: social media sites that were used most by adolescents during the pandemic and their reported purposes for each site's use.

Research Questions and Hypothesis

The following research questions were asked and following hypotheses were given.

RQ1: Among adolescents who experienced periods of COVID-19 lockdown, how was their choice of social media usage and their intended purposes related to current levels of loneliness?

H_a1: Social media usage and its intended purposes influence the current levels of loneliness, as measured by the UCLA Revised Loneliness Scale.

H_01: Social media usage and its intended purposes do not influence the current levels of loneliness, as measured by the UCLA Revised Loneliness Scale.

RQ2: Among adolescents who experienced periods of COVID-19 lockdown, how was their choice of social media usage and their intended purposes related to current levels of depression?

H_a2: Social media usage and its intended purposes influence the current levels of depression as measured by the Revised Children's Anxiety and Depression Scale (RCADS).

H_02: Social media usage and its intended purposes do not influence the current levels of depression as measured by the RCADS.

RQ3: Among adolescents who experienced periods of COVID-19 lockdown, how was their choice of social media usage and their intended purposes related to current levels of anxiety?

H_a3: Social media usage and its intended purposes influence the current levels of anxiety as measured by the RCADS.

H_03: Social media usage and its intended purposes do not influence the current levels of anxiety as measured by the RCADS.

Theoretical Framework

Erikson's (1968) theory of psychosocial development and Anderson and McCabe's (2012) theory of self-socialization formed the theoretical framework for the study. Psychosocial development theory (Erikson, 1968) describes how adolescents develop a sense of self during this period, and this development is achieved through the social interactions that they have with peers. Grusec and Hastings (2014) further noted in their research that as children grow into adolescents, the people they socialize with change, as does the level of intimacy with their parents. Pre-adolescent children can spend approximately 35% of their time with their family compared to adolescents who report spending only 14% of their time with their families (Grusec & Hastings, 2014). Recognizing the need for socialization with peers indicates the need to find ways to maintain peer interaction even when face-to-face interaction is curtailed.

Anderson and McCabe's (2012) theory of self-socialization addresses how adolescents are now connecting with their peers online. Anderson and McCabe (2012) described how socialization is changing and how having an online presence has an impact on adolescent social development. Social media offers an alternative means of connection with others including allowing adolescents to have a “parent-free zone” that is anonymous in nature when reaching out and looking for others who have similar interests (Anderson & McCabe, 2012). Anderson and McCabe’s parent free zone concept supports Grusec and Hastings’s (2014) findings in that adolescents are looking for ways to connect with their peers away from family and caregivers. Research shows that social media and digital media can give adolescents a way in which to connect with others (Anderson & McCabe, 2012) and even indicates how the use of online video games offers adolescents a place to connect with each other further (Granic et al., 2020).

Erikson (1968) explained that adolescents are at a stage of development during which they are establishing a sense of self, and this development is greatly enhanced through the interactions they have with their peers. More recent research supports the notion that interaction with peers is paramount for youth, and that this social interaction is often done in parent free zones (Anderson & McCabe, 2012). The use of online interaction has become the norm for most adolescents (Arnett, 1995) and it is estimated that adolescents can spend upwards of 9 hours per day on a digital device (Granic et al., 2020). Anderson and McCabe’s (2012) theory of self-socialization extends the psychosocial theory by Erikson (1968) in explaining that social media is now where adolescents can create these parent free zones. Psychosocial theory of development (Erikson’s, 1968) is still applicable in understanding the basics of why adolescent socialization is so important however self-socialization theory helps understand how changes in technology and its use the modern way of adolescent socialization is. More recent research also supports the notion that in addition to the psychosocial theory from Erikson (1968), theories related to increased use of internet and social media also explains how adolescents are participating in social interaction with peers (Granic et al., 202). There is support in the idea of how social media and internet use are contributing to adolescent social media from the work of Cauberghe et al. (2021). Cauberghe et al. spoke to how during COVID-19 adolescents did utilize social media for humor and for staying connected to their peers. It is within this desire to have peer contact, and finding a way to have it, even when face to face contact is not allowed that supports how adolescents themselves recognize its importance and how the use of social media is a tool that allows them to do it.

Understanding changes in technology and how adolescents are using technology to connect with others is necessary to understand the impact that they have on adolescent development. Chapter 2 can offer a further analysis of developmental theories and how social media has begun to have an impact on how adolescents are interacting with their peers and why adolescents are using social media, and the impact this is having on social development.

Nature of the Study

This research study was a quasi-experimental and quantitative in nature. Quasi-experimental studies are used when randomization is not used to select participants (Harris et al., 2006). The study used a convenience sampling which relies on participant self-selection, to gather participants as there are strict criteria that must be met to be a participant. Full randomization of participants cannot be achieved when using this form of participant selection. Convenience sampling is a form of non-probability sampling and is less objective in nature due to individuals needing to meet fixed criteria to participate (Stratton, 2021). It was determined that this could have the participants form a demographically representative sample, which can enhance generalizability of findings.

The target population for this study was adolescents aged 13-17 years old living in Canada and the United States who have experienced enforced lockdowns and social isolation as part of COVID-19 safety measures. Participants were recruited from within North America as there were similar restrictions used to reduce transmission of COVID-19. The necessary number of participants was calculated using G*Power 3.1.9.7 (Erdfelder et al., 1996), and a minimum of 180 participants would be required to complete the study and have meaningful results. Oversampling was conducted to ensure there was sufficient data to meet statistical assumptions, resulting in a total of 220 participants needed for this study.

Following consent from the parent or legal guardian, the next step was acquiring assent and then having the participants complete a questionnaire where they were asked to select their three favorite social media sites used during periods of COVID-19 lockdown and the top reason for visiting each of the social media sites selected. To measure levels of loneliness, depression and anxiety two psychometric tools were used: the Revised Loneliness Scale, Version 3 (Russell, 1996), and the RCADS (Radez et al., 2021).

This study used a multiple analysis of variance (MANOVA) to determine the relation between the dependent variables: depression, loneliness, and anxiety and the independent variables: social media sites used during COVID-19 and the intended purposes of using the selected social media. The MANOVA is the most effective way to analyze multiple dependent variables simultaneously (Frost, 2021). The MANOVA offers greater statistical power and can identify smaller effects between the variables than an analysis of variance (Frost, 2021). The MANOVA can also assess patterns between the multiple dependent variables and the use of MANOVA reduces Type I error, which is more likely when conducting multiple ANOVAs (Frost, 2021; Huberty & Morris, 1989).

Definitions

Anxiety: A condition linked to fear and manifests as a future-orientated mood state that affects cognitive, affective, physiological and behavioral response based on the fear of an anticipated event (real or imagined) that is perceived as threatening (Chand, 2022).

Depression: A medical illness that negatively affects how a person feels, the way a person thinks and the way that a person acts (National Institute of Mental Health, 2013)

Lockdown: The World Health Organization (WHO, 2020) refers to lockdowns as large-scale physical distancing measures and movement restrictions to slow the transition of COVID-19 as it limits contact between people.

Loneliness can be defined as a distressing feeling that one has when social needs are not being met by the quantity or quality of one's social relationships (Seeman, 2022). The UCLA loneliness scale measures loneliness as well as feelings of social isolation (Russell et al., 1978).

Quarantine is having people are placed in their home or a healthcare setting and are watched for symptoms to develop, due to an exposure to the disease of concern (Wilder-Smith & Freedman, 2019). It does not mean that the person is diagnosed with the disease, however until there is a period where there are no symptoms seen, during COVID-19 this quarantine concept had been used widely when individuals were exposed to someone who tested positive for the virus (Wilder-Smith & Freedman, 2019).

Social distancing: Has been put in place as a standard way of keeping people from being at risk of spreading COVID-19 and is used as a measure to prevent spread when it is unclear who has COVID-19, where the infection started and its unknown how wide the infection spread is (Wilder-Smith & Freedman, 2019). This is often done in schools, or office buildings or through suspension of activities where large groups of people are going to gather, like marketplaces and family events (Wilder-Smith & Freedman, 2019).

Social Isolation: A state or process in which persons, groups, or cultures lose or do not have communication or cooperation with one another (Collins, 2022).

Social Networking Site (SNS) Depression: A condition that has been noted when adolescents spend an increased amount of time on social media and are found to have developed the classic symptoms of depression (Christofferson, 2016).

Variants: Are the result of viruses differing from each other based on mutations that occur as the virus emerges (Kindrachuk & Souradet, 2021).

Assumptions

This study was a quantitative, quasi-experimental study, and there were three major assumptions made within this study. The first assumption was that participants were honest in having experienced social isolation as the result of COVID-19 safety restrictions, including an inability to attend school, participate in extracurricular activities, and have in-person social experiences with friends and family. It was further assumed that the participants were honest in the answers that they gave in the questionnaires and assessments. Before beginning to complete the instruments, participants were prompted to be honest in their responses. Procedures for maintaining confidentiality of participant information and responses were explained during the recruitment and consent procedures to alleviate any potential concerns participants may have and help ensure honesty in the answers provided. A related assumption was that parents allowed their adolescent children to answer questions in privacy, and without interruption or interference to ensure honesty in their answers. This was addressed by placing a note in the information provided to parents that they are to encourage their children to be open and honest and not interfere with their children answering the questions.

Further assumptions also included ensuring that there was no researcher bias within the study. Bias in research is any tendency that prevents unprejudiced consideration of a research question and can occur during study design or data collection (Pannucci & Wilkins, 2010). Within the study all efforts were made to ensure that there was no researcher bias by ensuring that the instructions for completing the questionnaire measuring social media use and purpose were presented clearly. The study procedures were designed so that there was no undue pressure from the researcher to influence the participants' responses. Freedom from researcher bias was also ensured by allowing participants to complete the questionnaires online and confidentially without the researcher being involved in the process. The psychometric tools that were used are also standardized and have been found to be reliable and were not created by the researcher and was completed online by the participants in privacy with no interference from the researcher.

Another assumption is that the participants had no other pre-existing clinical diagnosis for loneliness, depression, or anxiety outside of isolation during the pandemic. Participants were disqualified from participating in the study if they had previously been diagnosed with clinical depression and anxiety and the information given to the participants noted this explicitly.

Scope and Delimitations

Participants were obtained through self-selection and lived within the continental United States and Canada, as these countries had experienced mandatory shutdowns, lockdowns, and movement restrictions as per regulations set out by the World Health Organization. These characteristics allowed for generalizability in results to this broader population as the participants should have experienced similar amounts of time in social isolation.

Attempts were made to recruit a representative sample. Flyers and posters were posted on social media sites and sent out to organizations that work with youth.

G*power (Erdfelder et al., 1996) was utilized to establish the necessary sample size for the study to have sufficient power to interpret the results. Parameters were set to a medium effect size (.25), IV=2, DV=3, with a statistical power of .8 and an alpha of .05. It was calculated that a minimum of 180 participants would be required to complete the study and have meaningful results. For the study, 220 participants were required to incorporate oversampling. Oversampling is used as a method to address missing data resulting from incomplete surveys and questionnaires, as well as data deemed outliers. Oversampling also helps ensure that non-response bias does not occur. Non-response bias is more likely to occur in a study such as this one, which is voluntary and investigates a topic considered high-risk, namely adolescent mental health (Cheung et al., 2017). Non-response bias can impact results as participants are more likely to be lower risk in nature, and data may not reflect the true nature of adolescent mental health due to fears from potential respondents having to be honest about where their mental health is at in that moment (Cheun et al., 2017).

The participants were limited to individuals who are fluent in the English language for reading and writing to ensure that participants could fully understand the questions being asked because the revised UCLA loneliness scale (Version 3; Russell, 1996), and the RCADS (Radez et al., 2021) instruments were validated in English. The questionnaires for social media use and purpose of use were only offered in English. Participants were also expected to have had access to consistent and dependable internet throughout the pandemic to ensure they were able to access social media during periods of lockdown and social isolation.

Limitations

Within the study there are limitations to data reliability related to the time between the pandemic lockdowns and when participants were recruited, and data was collected. Participants were asked to answer honestly and do their best to recall information as accurately as they can as one limitation is also having accurate recall of which social media sites were used during periods of lockdown as well as what their purpose was.

A second limitation related to the time between the pandemic and when data was collected was that there are the possibility of other confounding factors that can contribute to loneliness, anxiety and depression. Within the demographic questionnaire participants were asked if there have been any new events in their lives that can increase levels of anxiety, depression and loneliness.

A third limitation was that the participants would not answer all the questionnaires fully, leading to missing data. To address this limitation, oversampling was implemented to ensure enough participants had complete data.

A fourth limitation was that because participants were self-selected, the sample may not be representative of the population. The use of online recruitment and data collection methods was helpful in reaching a broader, and potentially more demographically representative sample.

Significance of Study

This study offered updated research on the impact that social media use has on adolescent mental health, primarily in situations when adolescents are unable to connect with their peers in person. The results from this study pointed to better clinical interventions during and after periods of isolation. This study can inform caregivers of adolescents of the potential benefits and risks of social media use during periods of isolation and the impact on mental health post-isolation. The study results can identify ways to enable adolescents experiencing social isolation to have contact with each other that is beneficial to their mental health and mitigate any risk factors.

Summary

Chapter 1 included a review of the prior research on loneliness, isolation, and consequences to adolescent mental health as well as a short explanation of what social media is and how adolescents are utilizing it to socialize with their peers. This chapter also described the problem statement that was addressed in this study as well as the gap in current research with respect to using social media to continue socialization in periods of forced lockdown. Chapter 1 described the purpose of the study, the research questions and hypothesis and null hypothesis as well as the dependent and independent variables. This chapter described Erikson's (1968) theory of psychosocial development and Anderson and McCabe's (2012) theory of self-socialization which form the theoretical frameworks that are used in this study. Chapter 1 included how the study was a quantitative quasi-experimental design, targeting adolescents aged 13-17 years of age. Chapter 1 also described how a MANOVA was used to determine the relation between the dependent and independent variables. Chapter 1 included a review of the assumptions and the limitations. This study looks at filling the gaps that exist in current research for understanding the potential use of social media to build resilience during isolation.

Chapter 2 includes a review of the literature on adolescent social development theories that have been developed pre- and post-internet development. Research on social isolation is reviewed, including what social media is and how it was used during the COVID-19 pandemic. Research that discusses loneliness and its impact on adolescent mental health, and risk factors for moving into adulthood is discussed. The following chapter also reviews how social media has grown and how adolescents are using different platforms to stay connected with each other, as well as the other reasons that social media is becoming so popular with adolescents. There is discussion on research supporting the use of social media during social isolation.

Chapter 2: Literature Review

Introduction

COVID-19 changed the way people worked, learned, and interacted with one another. Safety measures to minimize the spread of COVID-19 forced people to work from home and children and adolescents to attend school using online classrooms from within their homes. How adolescents interacted with their peers also changed as a result of forced periods of isolation, and an inability to have face-to-face contact with each other. Social interaction is necessary for adolescents as loneliness and isolation can lead to an increase in depression and anxiety (Grusec & Hastings, 2014), and an inability to have physical connections with peers can have long-lasting impacts on adolescents and their social development (Sokol, 2009). Increased anxiety and depression can lead to an increase in risky behavior, school absences, substance abuse, and increased risk for suicidal ideation and suicide attempts (Glied & Pine, 2002). If not addressed, a lack of appropriate social development in adolescents can follow through into adulthood, causing individuals to have unhealthy relationships as well as increases in mental health concerns (Cauberghe et al., 2021; Goosby, 2013). The use of social media to connect with peers and share experiences has become more common with adolescents and has potential as a way to continue connections with peers even when face-to-face contact is not possible (Raju et al., 2015). Adolescents use social media for a variety of reasons that include not only connecting with others, but sharing their lives with others, finding information about what is going on around them in their community, and looking for solutions, and or supporting problems that they are having (Plaisime et al., 2020). Understanding how adolescents use social media and what their motivations for using social media are can be of value, as it is becoming the new norm for interaction between adolescents for socialization and peer connection.

Further research is required in how the use of social media and the internet can be used as a form of communication to prevent mental health concerns when adolescents have been forced into periods of social isolation. There is a gap in the research examining how the use of social media during a period of mandated isolation can impact adolescents' subsequent mental health. The purpose of this study was to understand how adolescents' use of social during periods COVID-19 lockdown could affect their current levels of loneliness, depression, and anxiety.

Chapter 2 reviews the literature on the history of COVID-19, including the effects of isolation and social distancing mandates. The chapter also includes literature on the impact that pandemics have had on mental health. The chapter also includes a review of the literature on social development and its impact on mental health, and the effects of social isolation on adolescents. In addition, the function of social media for adolescents is explored, along with social media use as an alternative for communication and socialization among adolescents. Chapter 2 reviews research on the use of social media during the early stages of the COVID-19 pandemic and recommendations for further research on this topic.

Literature Search Strategy

The literature search strategy included the following databases: PsychInfo, ProQuest Ebook Central, PubMed, Google Scholar. These searches included full text, peer-reviewed articles, dissertations, and references from journal articles being reviewed. Some of the key words used included *Theories of social development*, *adolescent development*, *childhood development*, *social development*, *changes in social development*, *the impact of loneliness*, loneliness in adolescents, *loneliness during isolation, public health response to COVID-19, timeline of COVID-19, loneliness and social isolation during isolation, anxiety, depression, and loneliness during isolation, social media apps and improvements during COVID-19*, and *advancements in social media, apps and social media used by adolescent*. Other key words have included *history of social media use, developments in social media*, and *adolescent use of social media*. The literature search focused on seminal peer-reviewed sources as well as those that were published since 2017.

Theoretical Foundation

Adolescents are often social in nature and rely heavily on their peers as the main source of company and support. Social development theories explain that adolescent social interaction is crucial for developing a healthy sense of self (Banerjee & Rai, 2020), and moving into adulthood with confidence in themselves as well as their relationships with others (Learner & Steinburg, 2004). There are several social development theories that support the need for positive social interaction with peers during adolescence and its impact on mental health and future relationships. For the purpose of this research study, Erikson’s (1968) theory of psychosocial development, Arnett’s (1995) theory of self-socialization and the “parent-free zone” (Anderson & McCabe, 2012) and the concept of self-realization, that is when an individual has had purposeful engagement in the world, life goals are more likely to be fulfilled (Rageliene, 2016) formed the theoretical framework. These psychosocial theories have developed and changed over time as the internet has been invented and with it the development of online social media platforms.

Newer theories of development have been developed with respects to the invent of the internet, however prior to social media Erikson's (1968) theory of development was one theory of development that described the importance of social development during the adolescent years and how healthy social development promotes healthy future relationships (Erikson, 1968). This theory also spoke to how adolescent social development is seen as the time that individuals develop their identity, and a sense of autonomy and self-worth (Erikson, 1968). Erikson's theory of social development gives a good background on understanding how and why adolescent social development is so important, as well as the risk factors to adolescent mental health when it does not. However, as times have changed and the invention of the internet and social media have occurred, theories around social development have evolved.

The theory of self-socialization further describes how adolescents become independent of the influence of their parents and other adults and begin to look to peers to help them form who they are (Arnett, 1995). Adolescents are more likely to look to their peers for friendship, intimacy, acceptance and the sharing of their feelings, and emotions than they are their parents and family members (Burnett & Blakemore, 2009). It is these relationships and focus on what others think of them that help adolescents develop a sense of self, and identity for themselves. How adolescents are connecting with others and developing this sense of self and identity has begun to change as the use of the internet, social media, and an ability to connect with others from all over the world has become a daily occurrence. The use of the internet has developed the concept of the cyber self and how a person chooses to present themselves on social media (Lesley University, nd) as well as give adolescents a space in which they can communicate with each other that is independent of their caregivers where they can be autonomous in how they socialize.

The internet has allowed adolescents to socialize and how they are able to connect with others, particularly their peers. During this time developmental time of adolescents, youth are seeking autonomy from their parents and have a greater desire to connect more with their peers (Pfeifer & Berkman, 2018). Adolescents report higher self-consciousness and more concern over what others (their peers) think of them, and their perceptions of self (Pfeifer & Berkman, 2018). Instagram is one of the top social media sites used by adolescents to share and connect with others their own age and it has become a common way for adolescents to socialize with peers (Bipoletta et al., 2020) and this is key in adolescent social development. There is evidence that shows that adolescents feel a sense of positive energy when they receive "likes" for a post or picture that they have put online and this positive energy benefits mental wellness (Bipoletta et al., 2020). Adolescent use of Instagram shows the shift in how adolescents are socializing and connecting with each other and how the internet and social media have become a very important aspect of social development for adolescents.

Adolescent Psychosocial Development and its Impact on Adolescent Mental Health

Theories of psychosocial development for adolescents emphasize the need to ensure a healthy sense of self and identity during the adolescent period of life to ensure healthy relationship skills are developed into adulthood. There are eight established stages of psychosocial development that are important turning points as children become adolescents and adolescents become adults (Orenstein & Lewis, 2021). These stages include stage 1, Trust vs. Mistrust from ages 0 years to 18 months; stage 2, Autonomy vs. Shame from ages 18 months to 3 years (Erikson, 1968). Stage 3, Initiative vs. Guilt, from ages 3-5 years, stage 4 effects ages 5-12 years with Industry vs. Inferiority, stage 5 is Identity vs. Role Confusion is the adolescent stage of development from 12 to 18 years of age (Erikson, 1968). Stage 6 is Intimacy vs. Isolation is from 18 to 40 years of age, stage 7 is Generativity vs. Stagnation is from 40 to 65 years of age and finally stage 8, Ego Integrity vs. Despair, occurs after 65 years of age (Erikson, 1968).

Each stage of psychosocial development consists of two opposing psychological tendencies, one that is positive (e.g., trust) and one that is negative (e.g., mistrust) (Orenstein & Lewis, 2021). It is these psychological tendencies that allow an individual to develop either strengths or maladaptive behaviors respectively (Orenstein & Lewis, 2021). Within stage 1 an infant needs care that is consistent, predictable, and reliable if they are to build trust with caregivers and not develop hopelessness and lifelong fear of the world around them (Erikson, 1968). In stage 2, if children are overly controlled or not given a chance to have autonomy, they are at risk of developing self-doubt and shame (Erikson, 1968). Stage 3 allows for the start of socialization and being allowed to have time away from parents and caregivers and spending more time socializing with peers in the same stage of development (Sokol, 2009). If a healthy balance of initiative and guilt is not found, children do not know how to exercise self-control or build a conscience, and this can cause unhealthy social interactions and relationships moving forward in life. (Sokol, 2009). Stage 4 is when children begin to attend school and as a result their peer group grows and begins to be a bigger part of their lives (Sokol, 2009). This 4th stage of development is when children are starting to form their own sense of self, and their increased peer interaction begins to impact this development (Sokol, 2009). Stage 5 is the stage during which adolescents develop a sense of self and what their place is in society (Sokol, 2009). Erikson (1968) spoke to the importance of this stage if adolescents are to develop a solid sense of self and move into adulthood with no maladaptive behavior (Sokol, 2009). If an adolescent develops maladaptive behaviors and emotional dysregulation, due to social isolation or interference with having healthy relationships at this stage they can be at risk of participating in at risk behaviors such as substance use, self-harm, unprotected sexual contact and eating disorders (Pedrini et al., 2010). Stage 6 is the late young adulthood stage and within this stage adults are forming careers and family and building their dream life (Chung, 2018). If maladaptive social development is not recognized and resolved within this stage, an adolescent becomes at risk for maladaptive behaviors to develop and continue into adulthood (Orben et al., 2020). Maladaptive behaviors that can create problems in relationships, an inability to make healthy lifestyle choices and mental health diagnosis, during the adult years.

The connection between healthy social development in the adolescent years and healthy adulthoods is interconnected as one stage feeds into another. Young adults that have not been allowed to have healthy social development in their adolescents are shown to be at higher risk for mental health concerns such as depression, anxiety, and substance misuse (Orben, et al., 2020). Loneliness in adolescents as the result of isolation from peers appears to be a major component of depression and anxiety that is found in young adults (Lau, et al., 1999). Not only are young adults at risk for mental health concerns but they are also at risk of having identity issues and not knowing their place in the world (Sokol, 1999). Identity issues continue into later adulthood and allow for individuals to grow into romantic relationships as well as relationships in other aspects of life such as work, leisure, and time in education (Sokol, 1999). If identity confusion begins during adolescence due to a lack of contact with peers, as seen when people are in isolation, the ability to carry on building and developing relationships can be negatively impacted (Sokol, 1999). It is important to ensure that adolescents are allowed to have social connection with their peers to prevent any maladaptive behaviors that can lead to mental health concerns as well as poor relationships in the future.

All the stages of development feed into each other. If individuals grow and develop through these stages with no maladaptive behaviors then there is a better chance that the individual had a healthy and well-adjusted life (Sokol, 2009). If a stage is missed, or interrupted due to changes in an individual’s environment, or life circumstances, the individual becomes at risk of developing maladaptive behaviors and may not be able to move appropriately into the next stage of development.

As individuals go throughout each stage of development, if the individual develops strengths in social interaction and a sense of self there is less risk of developing maladaptive behaviors that can have a negative impact on the next stage of development (Orenstein & Lewis, 2021). Adolescents are likely to look to their peers for social interaction (Grusec & Hastings, 2014). If social interaction with peers is missed or delayed due to social isolation and inability to engage with others, there is an elevated risk of the adolescents developing clinical mental health conditions, engaging in high-risk behaviors and an inability to develop healthy relationships (Orben et al., 2020). Identity vs. identity confusion marks the fifth stage of psychosocial development and is specific to adolescents (Orenstein & Lewis, 2021). The adolescent stage of psychosocial development has adolescents asking, “who am I?” (Block, 2011). Adolescents are likely to experience internal conflict with what their role is within their social relationships and the communities they live in (Block, 2011). This conflict also extends to what they should believe about themselves internally as well as externally (Block, 2011).

Offering adolescents a safe space and opportunities to interact with peers is something that is noted by social development theories as being of value to ensure healthy social development. Sokol (2009) noted that one of the important thing’s adolescents develop during this phase of life is identity and sense of self. This sense of self is developed during adolescents and from input received from their peers in their relationships (Nair et al., 2015). When adolescents are not given a safe space to develop a sense of identity there is the risk of role confusion, and this can lead to questioning oneself and lead to doubt moving forward as to the meaning of oneself within the world at large (Sokol, 2009). The development of self builds on Erikson's (1968) concept of identity, which focused primarily on adolescent psycho-social development and how there is a risk of experiencing an identity crisis when this sense of self is not developed properly (Rageliene, 2016). For adolescents, having a healthy sense of self and knowing their place in the world is likely to occur successfully when adolescents have access to healthy social relationships with peers.

According to psychosocial development theory, one of the main goals of adolescence is to resolve the crisis of identity versus (role) confusion (Rageliene, 2016). Adolescents need to form their own unique sense of identity and find social environments where they can create healthy and meaningful relationships with others (Rageliene, 2016). Adult role confusion can occur if there is no success in developing this sense of self and this is more likely to occur if an adolescent has not had healthy and meaningful relationships (Goldstein & Naglieri, 2014). Not only can role confusion can lead to having a weak sense of self and struggles with healthy adult relationships (Goldstein & Naglieri, 2014), but it can also create new problems such as mental health struggles, decreased academic achievement and future employability once in adulthood (Hellström & Beckman, 2021). Using social media can be one way that older adolescents can still negotiate important developmental tasks (Hellström & Beckman2021). This is also a time that these older adolescents are identifying, developing, and maintaining important social contacts (Hellström & Beckman2021). Ensuring that adolescents can connect and socialize with their peers and allow themselves to find their sense of self in these relationships is an important step to ensuring that adolescents move into adulthood with a healthy sense of self and the ability to maintain relationships.

Social Development Theories and Social Media Use

The use of media as a way for adolescents to begin developing a sense of self occurred prior to the invention and mainstreaming of the internet. Prior to the internet, adolescents used magazines, television, movies, and music to form identity based on what they were seeing in these media publications (Arnett, 1995). As times have progressed and technology has changed, the internet and social media are being used not only to continue on with physical forms of media such as magazines, movies and music, but also to communicate and connect with others. Arnett (1995) identified five reasons why adolescents use media, and they include entertainment, identity formation, high sensation, coping, and youth culture identification. Adolescents who have taken part in research have confirmed they enjoy using social media as a format for self-expression and validation (Popat et al., 2022). Social media can be used to form one's identity, including gender, gender roles, romantic relationships, and overall sexual identity (Arnett, 1995). Adolescents use selfies to support this identity development as well as share social moments with their peers (Popat et al., 2022). The sharing of pictures with their peers, as well as involving them in tagging them in events or pictures that they were part of continues with sharing of experiences as well as involving their peers within their social media, as well as gaining validation from others based on likes and shares within the social media platform (Popat et al., 2022). Usage of new technology and social media sites can allow adolescents to connect with their peers and share media as a way to connect with and experiences with others.

Building autonomy and independence is important to adolescents and this is often done through relationships that are based more on peers than family and caregivers. The use of the internet and social media are an opportunity for adolescents to have privacy and intimate time with their peers in an environment that is free of their parents and other caregivers in their lives. Adolescents have access to the internet and social media on their cell phones, tablets and laptops that often are accessed in private settings away from the eyes of caregivers (Moreno et al., 2022). Adolescents also have social media accounts that parents don't have access to or are not connected to as a follower or friend (Moreno et al., 2022). Social media use by adolescents is seen as a way that they can connect with others, in a "parent-free zone" (Anderson & McCabe, 2012). Grusec and Hastings (2014) discussed this theory of adolescents moving away from intimate relationships with their parents and moving into more intense and intimate relationships with peers. Adolescents surveyed were found to spend 35% of their waking time spent with parents when in the fifth grade but this is reduced to 14% by 12th grade (Grusec & Hastings, 2014). Social media and internet usage has been seen as the new way adolescents are connecting with more peers locally and from all over the world (Riddle, 2017). Increased access to peers can assist adolescents in developing a sense of self and allowing adolescents to become healthy well-adjusted adults (Anderson & McCabe, 2012). Increased internet use and greater access to peers worldwide has increased opportunities to interact with a diverse peer group.

Anderson and McCabe (2012) have expanded their theory to include how the use of social media and online digital media is now common use for self-socialization for adolescents. Anderson and McCabe (2012) further speak to the themes found in online self-socialization including the parent free zone, a broadened context, the anonymous nature of the internet context and perceptions of the hot and cool contexts. The parent-free zone addresses how adolescents are looking for space where they can connect with others and be free from their parents' observation or oversight (Arnett, 1995). Parent free zones allow them to have the chance to begin to have independence in the relationships that they are having with others, and this is an important steppingstone into how they was form adult relationships (Anderson & McCabe, 2012). Adolescents are in a unique stage of development that is most characterized by their development of social abilities and behaviors and their ability to connect with others. This development of social skills is important and allows adolescents to move forward into adulthood with the skills to build healthy stable relationships (Burnett & Blakemore, 2009). Theories of development utilized to describe the importance of social contact are social development theories developed by Erikson (1968), theories of self-socialization (Arnett, 1995), and the "parent-free zone" (Anderson & McCabe, 2012) that allows adolescents to explore their world without oversight from parents. Self-realization occurs through activities that allow a person to be self-defining or engaged and purposeful in life (Rageliene, 2016) and happens when an individual engages with the outside world for day-to-day interactions (Narain & Maheshwari, 2022). Given the role of social interaction on adolescent psychosocial development, research on the effects of isolation can help suggest ways to reduce the likelihood of long-term mental health problems.

History of the Pandemic and the Spread COVID-19

The world has been living with COVID-19 since roughly March of 2020, and it has drastically changed how people live and communicate since its discovery. COVID-19 is a virus that was discovered in Wuhan China, with the first human case recorded in early December 2019 (Allam, 2020). Symptoms of COVID-19 include runny nose, cough, fever, and chills (Allam, 2020). Although symptoms are similar to those of the flu, COVID-19 was quickly found to be a more serious and deadly virus that was readily transmissible (Allam, 2020). With the number of COVID-19 cases rapidly increasing and leading to hospitalizations and deaths within China, on January 24th, 2020, Chinese authorities announced a lockdown in parts of China (AlTakarli, 2020). It was further decided to shut down airports and suspend the use of all public transit, and all businesses (except those providing food and medicine) were closed, and the reopening of schools was suspended (AlTakarli, 2020). China was one of the first countries to announce health measures that included lockdowns, but as time went on other parts of the world were forced to do the same.

Within the first few months of 2020 other parts of the world began imposing lockdowns and movement restrictions to prevent the spread of COVID-19. By March 16th, 2020, U.S. state health departments declared a state of emergency (Bergquist et al., 2020). By May 1st, 2020, nearly all US states had put movement restrictions in place to slow the spread of COVID-19 (Siedner, 2020). Social distancing has been put in place to prevent the spread of COVID-19 and is used as a measure to prevent the spread when it is difficult to know who has the virus (Wilder-Smith & Freedman, 2019). As social distancing measures were put in place, the levels of new COVID-19 cases dropped (Siedner, 2020). Siedner (2020) reported that within 7 days following social distancing implementation, there was a reduction of 1600 actual cases of COVID 19. After 14 days of social distancing implementation there was a further reduction of 56,000 reported cases and after 21 days of implementation there was another further reduction of 621,000 reported cases (Siedner, 2020).

To further reduce and keep cases of COVID-19 low, schools were forced to shift to online learning, businesses were shut down, and most employers put staff to work from home, unless staff were deemed essential frontline workers. As well as school and work, most social and extracurricular activities were stopped. Public transit was closed, gyms and fitness facilities were shut down, and in many parts of Canada large and small gatherings, even between family, was stopped (Fakir & Bharati, 2021). Restrictions were largely based on people being willing to participate in these movement restrictions, however in certain parts of the world the use of fines was utilized as a way to punish those not following the mandated health measures put in place by governments (Niavis et al., 2021). Further safety measures such as quarantining of those that were confirmed to have COVID-19 were put in place, quarantining is used to watch for symptoms of COVID-19 when a person has been exposed to someone that is positive for COVID-19 (Wilder-Smith & Freedman, 2019). The initial state of emergency in many Canadian provinces was enacted in March of 2020, and in March and April of 2020, many parts of

Canada began to implement different forms of lockdown (The Chronicle Journal, 2021). Although challenging the use of social distancing measures, lockdowns and movement restrictions were shown to be effective at reducing the number of new cases of COVID-19.

As numbers of COVID-19 began to reduce some of the movement restrictions in place began to be lifted. As restrictions began to be lifted it was soon realized that there were new variants of COVID-19 spreading, and health authorities began to express concerns with respect to them. Variants of any virus are the result of mutations that occur, thus changing the makeup of a virus, including how quickly the virus spreads throughout the population and how severe the symptoms are (Kindrachuk & Souradet, 2021). The Delta Variant was a concern as it was noted by medical professionals to transmit quicker and easier, than the previous variant of the virus (Kindrachuk & Souradet, 2021). The Delta Variant was also noted to have more severe symptoms was more likely to send someone to the hospital with severe symptoms of COVID - 19 (Kindrachuk & Souradet, 2021). As new variants of COVID-19 were discovered, so were waves of infection. Waves are recognized as occurring in health as having understood that there are distinct and concrete periods of high numbers of infection that then reduce and stay low for a notable period of time (Zhang et al., 2021). A wave is not the same as a spike in cases, as a spike in cases in a momentary phenomenon versus a wave that has a clear timeline and stability in the number of lower cases then marked by a distinctive and long term rise in cases (Zhang et al., 2021) within Alberta, Canada all restrictions and distancing measures were lifted in the summer of 2021, this was then was followed by a fourth wave of COVID-19 (Anderson, 2021). This new fourth wave resulted in the highest numbers of active cases and hospital admissions to intensive care units since the beginning of the pandemic (Anderson, 2021). The Delta variant accounted for the rapid rise and fourth wave of COVID-19 in the province including new cases and hospital admissions in Alberta (Anderson, 2021). On September 29th, 2021, Alberta reported the highest number of deaths (34) seen since January of 2021 (CBC News, 2021). Active cases within Alberta were at 20,306, the highest in the country, as well as having 1084 people in the hospital and 268 of those in the intensive care unit (CBC News, 2021). These numbers required the Alberta government to reinstate some restrictions such as vaccine passports as well as social distancing and mandatory masking (Anderson, 2021). Although there was a short window of relief from movement restrictions and lockdown measures, the new variants of COVID-19 only created new waves and the need for reinstatement of restrictions and lockdowns.

Previous Pandemics and the Impact on Mental Health

COVID-19 is not the first time that a pandemic has occurred within the past 25 years. China learned quickly what to do when COVID-19 came to light, due to the SARS outbreak in 2003 (Wilder-Smith & Freedman, 2019). SARS was one of the first pandemics of the 21st century to get a high level of public attention and it was simpler to detect in people because they were more likely to have active symptoms and can easily be isolated to stop from spreading it to others (Wilder-Smith & Freedman, 2019). SARS affected approximately 10,000 individuals, mainly in China, and 251 cases in Toronto, Canada, creating an opportunity to examine the impact of placing patients into isolation and what this can do for their mental health (Huremović, 2019). This research can be expanded to apply to individuals who experienced COVID-19 isolation.

Previous pandemics such as SARS and H1N1 were the first mass outbreaks of disease in which researchers took note of the impact of forced isolation on mental health. Research completed on SARS and H1N1 reported that people's mental health during a mass outbreak of illness had started to be recognized as a secondary health concern (Javed et al., 2020). This has helped to see that mental health needs to be addressed as much as physical health during a pandemic (Javed et al., 2020). Panic, isolation, boredom, loss of freedom, missing loved ones, are all real things that can cause distress and damage one's mental health and eventually physical health as well (Javed et al., 2020). Studies completed on the SARS pandemic showed that children and parents in Australia in quarantine were four times more likely to have signs of post-traumatic stress disorder, than those that had not been in quarantine (Brooks et al., 2020). Of the parents studied by Brooks and Webster (2020), 28% reported sufficient symptoms to get a diagnosis of a trauma related disorder compared with 6% of parents that were not quarantined. The study completed by Brooks and Webster (2020) further reported that those in the group that were showing high levels of depression, 60% had been placed in quarantine during the SARS pandemic (Brooks et al., 2020). Previous research, like what has been completed by Brooks and Webster can assist mental health practitioners and those working with adolescents better understand potential risk factors of forced isolation moving forward from the COVID-19 pandemic.

Effects of Social Isolation on Adolescents' Psychosocial Development

Social isolation and loneliness can occur naturally for several reasons and can be different for everyone it impacts. Loneliness is defined as a state of solitude or being alone, it can also be the perception of being alone and isolated (Tiwari, 2013). The recent COVID-19 pandemic has created a need for isolation to stop the spread of the coronavirus (Patel et al., 2020), but concern has been raised around the effects of isolation, and possibly increased feelings of loneliness and the impact this can have on adolescents (Banerjee & Rai, 2020). Previous research has examined the effects of isolation on adolescents and their mental health due to adolescents being in a fragile stage of development (Ciampo & Ciampo, 2021). For adolescents, social groups can be a protective factor (Adams & Marshall, 1996) however if placed into a periods of isolation, research has shown that adolescents are not only at higher risk of developing delays in development, but they also can develop mental health concerns that can include depression, anxiety, lower cognitive functioning and extreme boredom and agitation (Ciampo & Ciampo, 2021). Boredom is seen as being in a complacent and unstimulated state of mind, and connections have been found between boredom, depression, further loneliness and isolation (Spoto et al., 2021). Within these periods of isolation adolescents are at increased risk of developing unhealthy ways of coping and are at higher risk of falling into high-risk behavior.

Research on animal studies can be a valuable tool for seeing what the consequences of isolation are, including what at risk behavior is developed to cope with loneliness. Animal studies that involve isolating adolescent animals for long periods of time report that the animals are more likely to have increased anxiety, hyperactivity and are more likely to look to food or drug rewards versus social rewards, and increased aggression (Orben et al., 2020). These consequences have been found across many animal species studied, and in almost all studies the results are the same (Orben et al., 2020). Other studies related to physical health report that adolescents that face social isolation and loneliness are more likely to face premature mortality, and it was further noted that females are at even higher risk of premature death then are males (Hognas et al., 2020). Research on human participants shows following a period of isolation, the most common forms of mental health diagnosis were acute stress disorder (16.7%), grief (16.7%) and post-traumatic stress disorder (PTSD; Loades et al., 2020). Among children who had experienced isolation during H1N1, 28% scored at the cut off for PTSD versus 5.8% who had not been in isolation (Loades et al., 2020). Forced isolation can cause increased feelings of loneliness, which can lead to increased mental disorders such as anxiety, depression, and adjustment disorders (Banerjee & Rai, 2020). Previous research completed on not only loneliness and isolation, but isolation as the result of a pandemic indicates that adolescents are at high risk of developing mental health problems as the result of these forced periods of isolation.

Further risk factors of isolation during adolescents include more social anxiety in adulthood, an inability to function in social settings with others, and the inability to process social interactions around them (Haller et al., 2015). This inability to appropriately process social interactions can lead to struggles with developing adult social relationships and this can lead to long term consequences as noted earlier (Haller et al., 2015). Long-term consequences of depression and anxiety resulting from loneliness experienced in isolation has been shown to have an impact on natural and healthy social development for adolescents (Glied & Pine, 2002). Studies have shown that adolescents who are diagnosed with depression are more likely to miss school, be at risk of substance misuse and other high-risk activities, including suicidal thoughts and active attempts of suicide (Glied & Pine, 2002). Adolescent anxiety is further linked to long term consequences in socializing with others, such as not being able manage social cues and seeing themselves in a negative light (Haller et al., 2015). The possibility of developing social anxiety disorders because of social isolation is a real risk factor. There needs to be an understanding of how social connections between adolescents can help prevent this and ensure that adolescents can develop healthy social skills and reduce developing mental health disorders in adulthood (Haller et al., 2015). The possibly of an increase in mental health concerns due to isolation and loneliness shows the need to find ways to mitigate the risk factors and find ways to assist adolescents in still being able to communicate with their peers, even when this cannot be done face to face.

Purpose of Social Media use for Adolescents

The use of social media has become normalized as a way for adolescents to communicate with each other. Adolescents are found to be one of the most well represented populations online with 96.4% of adolescents studied reporting utilizing social media (Plaisime et al., 2020). Adolescents are also found to be the earliest adopters and the heaviest users (Yonker et al., 2015). There are several social media sites and digital media formats that adolescents can use to connect with peers as well as gain more information. Some of the most popular include My Space, Facebook, YouTube, blog sites, and mixed social media sites (Yonker et al., 2015). It is on these sites that adolescents can continue and or build new relationships or gain a variety of new information that they are seeking (Yonker et al., 2015). Adolescents have been found to use social media for connecting with peers, self-expression, laughter, and comedy (Plaisime et al., 2020) as well as using social media to post pictures and connect with family (Plaisime et al., 2020). Social media can be seen as a keyway through which adolescents merging into young adults can continue with identity development through the maintenance of these social connections (Hellström &Beckman, 2021). Adolescents have also been found reaching out to social media as a tool to look for health information and health promotion, seeking motivation, and seeking information on making lifestyle changes (Plaisime et al., 2020). Adolescents studied by Plaisimen et al. (2020) reported that 24.7% of social media use was Facebook, 32.0 % was Twitter and that 53.8% reported using Instagram. Instagram has been found to be popular with adolescents due to instant gratification that can be had by users "liking" an image that has been posted (Cipolletta et al., 2020). Instagram is recognized as one of the most popular social media sites for self-promotion versus sites like Facebook that focus more on social relationships (Cipolletta et al., 2020). Adolescents have discovered that social media can be a way not only to remain connected with peers but also to find information benefiting their lifestyle but also receiving positive feedback and gratification. This use of social media for different areas of their life can allow adolescents to remain connected to the outside world even when in a period of forced isolation.

Social Media as an Alternative for Communication and Socialization Among Adolescents

As adolescents have faced isolation in the past couple of years due to the COVID-19 Pandemic it is of value to look to alternative forms of communication with peers and social groups. Advances in technology have given adolescents a new way of communicating and staying in contact with each other, even from a distance (Cauberghe et al., 2021). These alternative methods of communicating have developed new theories on how adolescents are likely to develop relationships with others, one of these theories is Self-socialization. Self-socialization is one theory that looks at how adolescents use of online social media is having an impact on social development especially given the amount of time that adolescents are spending online with each other (Anderson & McCabe, 2012). The internet has given adolescents a chance to have a new place in which they can express themselves and reach out to others that have similar interests from all over the world (Cauberghe et al., 2021). Anderson and McCabe (2012) noted that the past research reviewing the use of the internet by adolescents focused more on the risk factors and concerns for parents more than anything; however, Anderson and McCabe examined how the internet can be an alternative source of socialization, especially considering that at this stage of development family and as parents are no longer the primary source of social contact, but that peers are. The use of media as a form of communication and connection for adolescents cannot be ignored as it is becoming deeply ingrained in the day to day lives of adolescents everyone (Hasebrink et al., 2019). Adolescents are looking for ways to have parent free zones and make social choices for themselves, and the internet can give them this medium (Anderson & McCabe, 2012). Internet use has been found to give adolescents the chance to broaden their horizons and meet people outside of their spot in the world (Anderson & McCabe, 2012). The internet offers adolescents an opportunity to be present without having a bodily presence, and this means an opportunity for a larger world for the adolescent to engage in (Hasebrink et al., 2019). The internet provides this larger group of people for adolescents to have a connection with as well as finding more people that accept them for who they are and where they are at (Anderson & McCabe, 2012). This ability to connect with others, even in times when there is no one physically present shows that the internet can be an option for people to stay connected with others even when forced to isolate at home for a period (Cotton et al., 2013). Using social media can be one way that older adolescents can still negotiate developmental tasks (Hellström & Beckman, 2021). This is also a time that these older adolescents are identifying, developing and maintaining social contacts (Hellström & Beckman, 2021). Ensuring that adolescents have the opportunity to connect and socialize with their peers and allow themselves to find their sense of self in these relationships is an step to ensuring that adolescents move into adulthood with a healthy sense of self and the ability to maintain relationships.

Early research into adolescent use of social media during the COVID-19 pandemic indicates that adolescents are utilizing social media to connect more with others. Research completed by Cauberghe et al. (2021) was completed one month into the pandemic and as such can give insight into the very beginnings of social media use during the pandemic. It is now over two years since COVID-19 was discovered and there appear to be gaps in more current research from further along in the pandemic, on the impact of long-term isolation and social media use.

Summary

Chapter 2 reviewed literature that is related to social development for adolescents, including Erikson's (1968) theory of psychosocial development, Arnett's (1995) theory of self-socialization and the "parent-free zone" (Anderson & McCabe, 2012) and changes in psychosocial theories with the development of online social media platforms. A review on how social isolation can stunt healthy social development was done including consequences for future social development moving into adulthood.

Research completed from previous pandemics was reviewed and data about the loneliness felt by adolescents forced into isolation and the impact this had on their mental health was reviewed. Prior research conducted on this topic has not looked at if technology was a way for adolescents to continue relationships and connections with others during these periods of forced isolation. Preliminary research being done on the COVID-19 pandemic indicates an increase in the use of social media and technology to stay connected with peers during COVID-19 (Caugberghe et al., 2021). This early research has not been specific to the use of social media use to reduce the feelings of loneliness, anxiety and depression felt by adolescents during periods of forced isolation. This study is looking to address the gap in the research with respect to what impact, if any, on adolescents who have used social media to remain connected with peers during a period of isolation can impact future mental health.

Chapter 3 outlines the research methods within the study. Chapter 3 also summarizes research methods, design and approach, the population that is to be studied and the approach used to gain the appropriate population. Chapter 3 outlines instrumentation, the study constructs, validity, and ethical procedures that were used in the study.

Chapter 3: Research Method

Introduction

This research study determined whether there were any differences in adolescents' levels of loneliness, anxiety, and depression based on social media use during COVID-19 lockdowns. This study had the adolescent participants state which social media sites they visited and their intended purpose for that visit during the COVID-19 lockdown. This chapter outlines the research design and methodology, including a description of the population, recruitment and data collection procedures, instrumentation, data analysis plan, and threats to validity. The chapter concludes with a description of ethical guidelines to protect the rights of those participating in the study.

Research Design and Rationale

The purpose of this study was to explore how the use of social media and the users' intended purpose during periods of lockdown during the COVID-19 pandemic influenced the levels of loneliness, depression, and anxiety currently felt among adolescents within Canada and the United States. Participants indicated which social media sites they used most often throughout periods of isolation and what the intended purpose was for use. These independent variables were measured to determine if they are related to the dependent variables of depression, anxiety, and loneliness.

The study was a quantitative quasi-experimental design using questionnaires and standardized instruments to gather the data. Quantitative research focuses primarily on objective measures and is useful when collecting quantifiable data measuring variables and inferences from population samples (Almeida et al., 2017). There were no time constraints for analyzing the data once collected; however, it was valuable to analyze data in time for the data to remain relevant and current.

Quasi-experimental designs are necessary when participant selection is non-random in nature, and no control group is used (Thomas, 2020). A quasi-experimental design is also effective when utilizing non-randomized studies. However, I aimed to demonstrate causality between an independent variable and dependent variables and, in this case, whether or not the use of social media sites and the intended purpose for this had an impact on current levels of anxiety, depression, and loneliness in adolescent participants (Harris et al., 2006). There was no control group for this study, and all the participants experienced periods of lockdown and movement restriction due to the COVID-19 pandemic.

This study determined whether a cause-and-effect relationship exists between the independent variables: social media sites visited most often by participants during the COVID-19 pandemic and the intended purpose for use, and the three dependent variables: current levels of loneliness, depression, and anxiety felt by the participants. This research project used a two-way multivariate analysis of variance (MANOVA) to test all hypotheses simultaneously and identify interactions between the dependent variables. The MANOVA is an ANOVA that is mathematically extended to apply when there are two or more dependent variables (Warne, 2014). A Type I error is when the researcher fails to reject the null hypothesis even though it is true in the studied population (Banerjee et al., 2009). One way to reduce this error when studying two or more dependent variables is to ensure that a large enough population is studied (Banerjee et al., 2009) and conduct a MANOVA (Warne, 2014). The MANOVA reduces the chances of a type I error because it reduces the number of t-tests needed, which could inflate the likelihood of a Type I error (Warne, 2014).

Research Questions and Hypothesis

This study looks at the following research questions.

RQ1: Among adolescents who experienced periods of COVID-19 lockdown, how were their choice of social media usage and their intended purposes related to current levels of loneliness?

H_a1: Social media usage and its intended purposes influenced the current levels of loneliness as measured by the UCLA Revised Loneliness Scale.

H_01: Social media usage and its intended purposes did not influence the current levels of loneliness as measured by the UCLA Revised Loneliness Scale.

RQ2: Among adolescents who experienced periods of COVID-19 lockdown, how were their choice of social media usage and their intended purposes related to current levels of depression?

H_a2: Social media usage and its intended purposes influenced the current levels of depression as measured by the Revised Children's Anxiety and Depression Scale.

H_02: Social media usage and its intended purposes did not influence the current levels of depression as measured by the RCADS.

RQ3: Among adolescents who experienced periods of COVID-19 lockdown, how were their choice of social media usage and intended purposes related to current levels of anxiety?

H_a3: Social media usage and its intended purposes influenced the current levels of depression as measured by the RCADS.

H_03: Social media usage and its intended purposes did not influence the current levels of depression as measured by the RCADS.

Methodology

Population

The target population for this study was adolescents aged 13-17 years living in Canada or the United States who had experienced forced lockdowns and social isolation due to COVID-19 safety restrictions. Participants provided the months they experienced lockdowns and movement restrictions during the pandemic. They were required to read and write in English. Participants had access to the internet and were technologically fluent to participate in this study. Exclusion criteria included individuals who were diagnosed with a developmental disorder, clinical depression, or anxiety prior to COVID–19 and adolescents who have a learning disability that causes difficulty with reading and comprehension of the assessments and questionnaires. Further exclusion criteria included homeschooled adolescents before the pandemic, those outside the population age range, and incarcerated adolescents.

The 2016 Canadian Census recorded 985,00 males, 937,00 females between the ages of 10 and 14, and 1,039,215 males and 986.940 females between the ages of 15 to 19. Within Canada, 26,007,500 reported that English was their primary language (Statistics Canada, 2017). Within the United States, in 2020, it was reported that there were 25.1 million adolescents aged 12-17 years (U.S. Census Bureau, n.d.). A large pool of adolescents in the United States and Canada were participants in this study.

Sampling and Sampling Procedure

The sampling method used for this study was convenience sampling. Convenience sampling draws from a source that is convenient and accessible to the researcher(s) and the purpose of the study (Andrade, 2021). The results of this study applied to the population (adolescents between 13-17 years of age who lived in communities with periods of lockdown during the pandemic) being studied. Generalizing the findings beyond the population could jeopardize external validity (Andrade, 2021). Using convenience samples can mean having high internal validity if the findings are trustworthy (Andrade, 2021). Convenience sampling was the most appropriate sampling method for this study as the participants were recruited online, and there was not as much control to ensure participants met requirements.

The sample size was estimated using G*POWER 3.1.9.7 (Erdfelder et al., 1996) with parameters set to a medium effect size (.25), IV=2, DV=3, with a statistical power of .8 and an alpha of .05. Calculations showed a minimum of 180 participants were required to complete the study and have meaningful results. Oversampling was intended to address missing data due to incomplete surveys and questionnaires and data deemed as outliers (Vaughan, 2017). There was a total of 220 participants needed for this study after considering the need to have 40 additional participants to provide sufficient oversample.

Participant Recruitment

Participant recruitment was conducted through online sources as well as in person. Recruitment included using social media sites such as Facebook. Flyers were posted on online websites, school newsletters, and other physical announcement boards within communities and organizations. The flyers included the dates for meetings to be held online using Zoom and Microsoft Teams and in person utilizing schools and community centers to explain the study to parents and gain their consent. Utilizing online methods to recruit participants adhered to any pandemic-related safety measures and reach a more extensive demographic base. Recruitment information provided the URL for the data collection site. Parental consent was collected online using the same URL that housed the questionnaires and psychometric assessment tools; an information page had information about the study. Parents were required to review a consent form that they could sign online to allow their children to participate in the study. Contact information was provided to the parents and participants if they had any questions. They were also provided with contact information to access a copy of the study results upon completion. Once the parent provided consent, a unique identification code was issued, which their adolescent child used to access the SurveyMonkey site to provide assent and complete the study items. The adolescent participant had seven days during which time their access code granted them access to the questionnaires and psychometric tools. There was no need for debriefing as the study did not involve any intervention or deception; it only gathered information and responses from the participants. Participants completed their responses to the questionnaire and instruments within a single session; no follow-up or second data collection session was necessary. While no psychological discomfort should have occurred, the consent and assent forms also provided information for free support services

The inclusion criteria for this study were that participants were between 13 and 17 years of age, male and female. Participants lived in regions of Canada or the United States where there were mandatory lockdowns and adolescents experienced isolation from their peers. They must be able to read and write in English. Parental permissions were required as participants were minors.

Exclusion criteria for this study included adolescents diagnosed with clinical anxiety and depression prior to the COVID-19 pandemic. Further exclusions included incarcerated adolescents and those who did not have access to reliable internet service throughout the COVID-19 lockdown.

Questionnaire and Instrumentation

Data on social media sites were gained using a questionnaire asking participants to select their three favorite sites used during periods of COVID-19 lockdown. Social media sites included Facebook, Twitter, Snapchat, TikTok, Instagram, YouTube, Zoom, FaceTime, and “other,” with the option to state what the “other” reason was.

To gain data on the primary purpose for accessing social media sites, participants selected their primary reason for utilizing each of the social media sites they selected. Response options for each selected site included a) to connect with friends and family, b) to gain information, c) to escape life temporarily, d) to find humor, e) to find entertainment, f) to share information with others, g) to look for help with my problems,

h) to share my accomplishments and i) “other” with the option to write what the “other” reason was. Only one reason could be chosen for each social media site selected, but the exact reason could be chosen for more than one site.

Two psychometric assessments were used to gather data on depression, anxiety, and loneliness. The psychometric tools were the UCLA Revised Loneliness Scale (Version 3; Russell, 1996) and the RCADS (Radez et al., 2021). Permission was granted from the copyright holders of both psychometric tools for their use in this study (see Appendix A).

The UCLA Revised Loneliness Scale

The UCLA Revised Loneliness Scale was used and has 20 questions that focus on loneliness and social isolation and should take approximately 5 minutes to complete. The UCLA Revised Loneliness Scale utilizes a Likert scale to assess the participants' attitudes in completing the psychometric assessment. Likert scales are ordinal and allow the participant to rate the degree to which they agree or disagree with a statement (Sullivan & Artino, 2013). Response choices on the Likert scale include O, “I often feel this way”; S, “I Sometimes feel this way”; R, “I rarely feel this way”; and N, “I never feel this way” (Russell et al., 1980). Scoring is quantitative, using whole numbers ranging from 1 (N) to 4 (O). Nine questions are reverse scored to keep scoring aligned. The numeric scores from all items were summed up to generate an overall score. A higher overall score signifies a higher level of loneliness the participant feels (Russell et al., 1980). The overall score represents the value for the loneliness variable.

Significant correlations indicated convergent validity for the scale with other measures of loneliness. Constructing significant correlations supported validity with measures of the adequacy of the individual's interpersonal relationships and between loneliness and measures of health and well-being (Russell et al., 1980). Earlier studies have utilized Cronbach's alpha to show a high level of internal consistency of .96 (Russell et al., 1978), and a later study showed internal consistency scores of .89 to .94 (Russell, 1996). There are no reports establishing the reliability of this instrument in an online format. A Cronbach's alpha was calculated using the participant data to ensure reliability among the sample.

The Revised Children's Anxiety and Depression Scale (RCADS)

The RCADS is a self-report instrument for children and adolescents aged 8–18 (Radez et al., 2021). This instrument is offered in 19 languages and takes five to ten minutes to administer (Child Outcomes Research Consortium, n.d.). This instrument has 47 items and assesses five anxiety subscales and one depression subscale. The subscales include generalized anxiety (GAD), separation anxiety disorder (SAD), social phobia (S.P.), panic disorder (P.D.), obsessive-compulsive disorder (OCD), as well as major depressive disorder (MDD) (Donnelly et al., 2019). The subscales measured by the RCADS were consistent with the DSM-V for the diagnosis of anxiety disorders and MDD (Kösters et al., 2015).

The RCADS has four response options for each question asked. The response statements include, "this never applies to me," scored as 0, "this sometimes applies to me," scored as 1, "this often applies to me," scored as two, and "this always applies to me," scored as 3. The participant is instructed to select the response option that best reflects how closely the item describes them.

Analysis of the RCADS completed by Kösters et al. (2015) tested areas of validity in a controlled trial for the effectiveness of school-based prevention programs for childhood anxiety and depression. A Model Fit was evaluated using The Root Mean Square Error of Approximation (RMSEA), and a value of <0.048 was obtained, indicating a good fit. Although lower, the Tucker-Lewis coefficient was obtained at .086 and still indicated a fit close to acceptable values (Kösters et al., 2015). Cronbach's alpha was calculated for each subscale to test the internal consistency of the RCADS; scores ranged from 0.70 to 0.95 in the total sample, indicating good internal consistency (Kösters et al., 2015). Kösters et al. (2015) showed a high correlation (r=0.69 for boys ages 8 to 13 years and r=0.74 for girls ages 8 to 13) between the RCADS overall anxiety scale and the MDD scale. The RCADS has been found effective for identifying symptoms of anxiety and depression in children that parents or educators might not notice. It has also been found effective for detecting a change in symptoms over time.

Data Collection

Data collection occurred online using SurveyMonkey. Participants provided demographic information, including gender, age, grade, family composition, internet accessibility, and how many months they had experienced lockdowns and movement restrictions during the COVID-19 restrictions.

Obtaining data on which social media sites adolescents used and the intended purposes of use, check boxes were used to allow participants to select their top three social media sites used during lockdown periods. A new question with a set of check boxes was used to allow participants to select the top 3 purposes of social media use. Participants could also select "other" and provided information about a favorite social media site not already listed. Data points were created by combining all potential combinations of the three sites chosen and the three purposes of the sites chosen.

Data Analysis Plan

SPSS v30 was used to analyze the data gathered in the study. For the study, data for the independent variables, favorite social media sites, and purpose for access to social media sites were nominal data. The data collected for the first independent variable, social media site chosen, was entered into SPSS in combinations of three choices out of a total of 9 options. The combinations were coded as SM1, SM2, SM3, and so on, for a total of 84 combinations. The data for the second independent variable, the purpose of social media, was three out of eight options. The combinations were coded as P1, P2, P3, and so on, for 56 possible combinations. These combinations were coded in SPSS to reflect how many of the participants selected each combination option.

The RCADS provided batch scoring of participants' responses within SPSS. The resulting batch scoring generated T-scores for the RCADS anxiety and depression subscales for each participant. T scores of 65 or higher are at the clinical borderline, with T scores of 70 or above as clinically significant (Child Outcomes Research Consortium, n.d.). Mean replacement was used within the RCADS to adjust subscale scores if two or fewer items for the subscale were missing (Child Outcomes Research Consortium, n.d.).

RCADS protocols received with two or fewer items left unanswered were kept for analysis.

A two-way MANOVA was intended to be used to determine if there is a possible interaction between three dependent variables (current levels of loneliness, depression, and anxiety) based on the two independent variables (the top three social media sites used and the purposes for their use). Using a MANOVA for the study reduced the risk of a Type 1 error. Data was plotted on a scatter plot chart to see what the interactions looked like and whether there were any outliers and to examine the relationship between the variables (negative or positive). These results determined which post-hoc analysis (descriptive discriminant or ANOVA) would have been best to determine the close relationships within the interaction.

Data Analysis Assumptions

Assumptions for a two-way MANOVA related to this study included ensuring that dependent variables could be measured at the interval or ratio level. For this study, there were three dependent variables: depression, loneliness, and anxiety. These variables were ordinal in nature, as the psychometric scales that were used to gather data had responses that ranged from best to worst in how they were answered (Laerd Statistics, n.d.).

The second assumption was that two independent variables consist of two or more categorical independent groups. For this study, the two independent variables were social media sites used and the purpose for their use. These variables were categorical, as the participants were be asked to give the top three sites used and the main reason why each site was used (Laerd Statistics, n.d.).

A third assumption that applied to this study was that there was an adequate sample size. G*Power software indicated the necessary number of participants. I will be recruiting 20% more participants than what G*Power recommends to ensure that there is not a type 2 or false negative error, as well as giving enough statistical power to answer the primary research question (Andrade, 2020).

A fourth assumption was that there is a linear relationship among all the pairs of dependent variables. A Scatter box Matrix can be completed between the dependent variables to ensure linearity. Doing a scatter box matrix ensured linear relationships between the variables; otherwise, the power of the test was reduced.

A fifth assumption was that homogeneity of variance-covariance matrices exists, and a Box's M test of equality of covariance matrices within SPSS was completed. If the Box’s M test was significant, then a straightforward linear regression for each dependent variable was completed. Care was taken to ensure that the assumption of normality is on the residual and not on the dependent variable.

A sixth assumption of the two-way MANOVA was that there is no multicollinearity. Ideally, the dependent variables moderately correlate with each other. If the correlations were low, a one-way ANOVA was run to test whether the correlation(s) are too high. If this occurs, there is a multicollinearity problem within the MANOVA (Laerd Statistics, n.d.).

Further assumptions for this study also included ensuring that the received data is accurate and complete. This study used SPSS to process the data, and as such, data cleaning was done within SPSS after all the data has been entered. The data of the variables are checked to ensure there is no missing data within the variables, and participants were instructed to answer all the questions in full to avoid having an issue ensuring that there are no univariate or multivariate outliers. Univariate or multivariate outliers can be detected using a boxplot in SPSS. A Mahalanobis Distance was completed within SPSS to check for multivariate outliers. Multivariate normality can be challenging to test for the Shapiro-Wilk test of normality is utilized and completed through SPSS.

Threats to Validity

When using a Quasi-experimental design, there is an inability to sufficiently control for important confounding variables that arise from the lack of randomization (Harris et al., 2006). Confounding variables occur when there are outside factors not accounted for that can influence results (Harris et al., 2006). In the case of this study, there was a chance that participants had anxiety and depression prior to COVID-19. There was no fixed way to address the possibility of this confounding variable as this is a risk when using quasi-experimental non-randomized formats of studies and is one reason that randomized controlled trials are often recommended (Harris et al., 2006).

The data collected for this study relied on participant self-report. Concerns with this style of data collection can include participants having response bias, especially if parents are reading or overseeing what is being reported. In this study, parents were asked to allow their child privacy when completing the questionnaire and psychometric instruments. Questions within the survey must be at a reading level that all participants can understand. The survey questions were non-biased as they were standard questions used to collect demographic information, and the instruments were reliable and valid. Participants were reminded that their information was confidential and not shared outside the study, to encourage honest responses.

Participants came from areas with different timelines for isolation and restriction of movement. Participants reported how many months they spent in total so far (at the time of reporting) in isolation because of COVID-19 in their community.

Within the RCADS, no concerns were raised about participant distress as a result of completing the psychometric tool. The author of the UCLA Loneliness Scale (Russell, 1996) did not discuss the possibility of distress of participants completing the scale; however, Russell (1996) found that some users struggled to understand the language and readability presented in the questions. To manage these issues, the creators of the scale simplified the language, wording, and "how often do you feel" (Russell, 1996).

There were issues with obtaining a sufficient sample size and collecting a large enough pool of data to ensure reliable results. Additional time was taken for data collection due to a lack of participants. Oversampling was maintained in an attempt to ensure a representative sample and enough participants with complete data.

Ethical Considerations

The population of interest involves participants under 18; parents were required to provide consent for their adolescent children to complete the surveys and participate in the study. The participants were made aware that while parents may have given consent, as participants, they had to provide informed assent and had the right to withdraw at any time without penalty. To ensure informed consent, parents and participants were given complete information about the study, including the data collection procedures, the purpose of the study, and how anonymity and confidentiality were maintained.

Steps were taken to ensure the confidentiality of participant data: all data received was stored on a secure hard drive, and data was accessible only to me and my supervising faculty. To preserve participant anonymity, numbers were assigned to the surveys and instruments rather than using identifying information such as names.

The instruments and questionnaires chosen for this study were not intrusive and did not trigger negative emotions in the adolescents who completed them. Resources were provided should any participant have experienced an adverse emotional reaction to the questionnaires or instruments. While no psychological discomfort was expected, the consent and assent forms provided participants with information about free support services.

Participants' parents provided informed consent through online consent forms for the study and acknowledged they understood they could withdraw consent and may withdraw their child from the study at any time. Participants (the adolescents) also provided assent and acknowledged that they understood their rights as participants. Participants had the right to leave the study at any point if they felt the need to, with no consequence for doing so. Their information, questionnaires, and psychometric instruments were destroyed if they chose to leave the study. There were no incentives for participation, such as monetary payment; the study was voluntary.

Approval to conduct this study was obtained through Walden's Institutional Review Board before beginning any recruitment or data collection (IRB#01-18-24-0653438). The copyright holders gave permission to use published instruments for The RCADS (Radez et al., 2021) and the UCLA Revised Loneliness Scale (Russell, 1996). Appendix B contains permission to use these assessments.

Summary

Chapter 3 discussed the design and approach for this study. This chapter outlined the research questions, hypotheses, and variables. The research design and methods were discussed as well as participation selection and recruitment. The participant sampling methods were explained as well as data collection. The questionnaires and instruments used, as well as ethical considerations and potential threats to validity, were also described. What follows in Chapter 4 is a description of the data analyses and results.

Chapter 4: Results

Introduction

In this quantitative study, I determined whether the type of social media and the purposes for their use by adolescents were related to current levels of anxiety, depression, and loneliness. This chapter outlines the data collection, the description of the sample, and the results of the analyses. The data were analyzed to determine a possible interaction between three dependent variables (current levels of loneliness, depression, and anxiety) based on the two independent variables (most frequently used social media sites and the purposes for their use).

There are three research questions that were asked in this research study. Among adolescents who experienced periods of COVID-19 lockdown, a) how were their choices of social media usage and their intended purposes related to current levels of loneliness, b) how were their choices of social media usage and their intended purposes related to current levels of depression, and c) how were their choices of social media usage and intended purposes related to current levels of anxiety?

Data Collection

Data collection occurred over a 6-month period. Participants were recruited online through flyers and video posts on social media sites. Parents provided consent through a form on SurveyMonkey, and the participants provided assent before they could complete the questionnaire. G*Power indicated that 180 participants were required to ensure that results would have sufficient power and effect size. In total there were N=235 adolescent participants recruited who completed demographic items and questionnaires. A total of *n*=77 participants were removed from further analyses as the data was incomplete, and scoring of the RCADS and the UCLA Loneliness Scale was not possible. Following data cleanup, *n*=158 questionnaires were identified as complete and usable. The data-cleaning process is described later in the chapter.

Participant Demographics

There were slightly fewer female participants (*n*=64) than male participants (*n*=94; see Table 1). As noted in Table 2, *n*=110 participants resided in Canada during lockdown, and *n*=48 participants resided in the United States during lockdown.

Table 1

Gender Assigned at Birth

Gender	*n*	%
Male	94	59.5
Female	64	40.5
Total	158	100.0

Table 2

Country of Residency During COVID 19

Country	*n*	%
Canada	110	69.6
United States	48	30.4
Total	158	100.0

During periods of COVID-19 lockdown, the highest number of Canadian participants reported living in Alberta (n=9), followed by Nunavut (*n*=7). Within the United States, the largest number of participants lived in North Carolina (n=36), followed by Arkansas (*n*=8). Participants represented a broad geographical area of North America, from all 10 Canadian Provinces and Territories as well as throughout the United States.

Table 3 lists the geographic distribution of participants during the COVID–19 pandemic.

Table 3

Province and State of Residency During COVID–19

	Frequency	%
British Columbia	2	1.3
Alberta	9	5.7
Saskatchewan	1	.6
Manitoba	3	1.9
Quebec	4	2.5
Ontario	2	1.3
New Brunswick	5	3.2
Nova Scotia	5	3.2
Newfoundland/Labrador	4	2.5
Prince Edward Island	3	1.9
Nunavut	7	4.4
NWT	1	.6
Yukon	2	1.3
Canadian total	48	30.4
Arkansas	8	5.1
California	2	1.3
Colorado	1	.6
Connecticut	5	3.2
Delaware	5	3.2
Florida	7	4.4
Georgia	5	3.2
Hawaii	3	1.9
Idaho	2	1.3
Illinois	2	1.3
Iowa	1	.6
Kansas	1	.6
Kentucky	1	.6
Maine	6	3.8
Maryland	2	1.3
Massachusetts	3	1.9
Michigan	2	1.3
Missouri	3	1.9
Nebraska	2	1.3
New Hampshire	1	.6
New Mexico	1	.6

New York	4	2.5
North Carolina	36	22.8
North Dakota	2	1.3
Ohio	1	.6
Oregan	1	.6
South Dakota	1	.6
Utah	1	.6
Washington	1	.6
American total	110	69.6
North American total	158	100.00

Most participants indicated that they spent 9 or 10 months in lockdown (*n*=102), as shown in Table 4. Participants reported an amount of time in lockdown that ranged from 3 months (*n*=1) to 24 months (*n*=1), with a mean of 9.82 months and a median of 10.00 months.

Table 4

Number of Months Participants Experienced Lockdown

	Frequency	%
3	1	.6
4	1	.6
5	3	1.9
6	1	.6
7	15	9.5
8	13	8.2
9	38	24.1
10	64	40.5
11	8	5.1
13	3	1.9
16	4	2.5
17	1	.6
19	2	1.3
21	2	1.3
22	1	.6
24	1	.6
Total	158	100.0

Participants in the sample ranged in age from 13 years (*n*=5) to 18 years (*n*=1), with older adolescents tending to participate more than younger adolescents (median age = 16.00 years). Their grade level ranged from 7th grade (*n*=2) to 12th grade (*n*=46), with a median of 10th grade. Tables 5 and 6 show the participants' ages and grade levels, respectively, at the time of data collection.

Table 5

Participants' Age at Data Collection

Age	*n*	%
13 years	5	3.2
14 years	11	7.0
15 years	27	17.1
16 years	39	24.7
17 years	75	47.5
18 years	1	.6
Total	158	100.0

Table 6

Grade Level at Data Collection

Grade	*n*	%
7	2	1.3
8	8	5.1
9	20	12.7
10	59	37.3
11	23	14.6
12	46	29.1
Total	158	100.0

Independent Variable Creation

As part of the data analysis preparation, variables were created to record each combination of participants' three choices for both social media sites used (SMS Combo) and social media purposes (SMP Combo). Selecting three media sites from nine possible choices generated a total of 84 possible combinations. After a review of the data, the number of combinations for SMS was reduced to 61 (Table 7) as some combinations were not selected by any participants. The participants' top three social media choices were the basis of the value assigned for the SMS Combo variable.

Table 7

Social Media Sites Combinations

Value	Top three social media sites used during lockdown
1	Facebook/Twitter/Snapchat
2	Facebook/Twitter/TikTok
3	Facebook/Twitter/Instagram
4	Facebook/Twitter/YouTube
5	Facebook/Twitter/Zoom
6	Facebook/Twitter/FaceTime
7	Facebook/Snapchat/TikTok
8	Facebook/Snapchat/Instagram
9	Facebook/Snapchat/YouTube
10	Facebook/Snapchat/Zoom
11	Facebook/Snapchat/FaceTime
12	Facebook/TikTok/Instagram
13	Facebook/TikTok/YouTube
14	Facebook/TikTok/Zoom
15	Facebook/TikTok/FaceTime
16	Facebook/TikTok/FaceTime
17	Facebook/Instagram/Zoom
18	Facebook/Instagram/FaceTime
19	Facebook/YouTube/Zoom
20	Facebook/YouTube/FaceTime
21	Facebook/Zoom/FaceTime
22	Twitter/Snapchat/TikTok
23	Twitter/Snapchat/Instagram

24	Twitter/Snapchat/YouTube
25	Twitter/Snapchat/Zoom
26	Twitter/Snapchat/FaceTime
27	Twitter/TikTok/Instagram
28	Twitter/TikTok/YouTube
29	Twitter/TikTok/Zoom
30	Twitter/TikTok/FaceTime
31	Twitter/Instagram/YouTube
32	Twitter/Instagram/Zoom
33	Twitter/Instagram/FaceTime
34	Twitter/YouTube/Zoom
35	Twitter/YouTube/FaceTime
36	Twitter/Zoom/FaceTime
37	Snapchat/TikTok/Instagram
38	Snapchat/TikTok/YouTube
39	Snapchat/TikTok/Zoom
40	Snapchat/TikTok/FaceTime
41	Snapchat/Instagram/YouTube
42	Snapchat/Instagram/Zoom
43	Snapchat/Instagram/FaceTime
45	Snapchat/YouTube/FaceTime
46	Snapchat/Zoom/FaceTime
47	TikTok/Instagram/YouTube
48	TikTok/Instagram/Zoom
49	TikTok/Instagram/FaceTime
50	TikTok/YouTube/Zoom
51	TikTok/YouTube/FaceTime
52	TikTok/Zoom/FaceTime
53	Instagram/YouTube/Zoom
54	Instagram/YouTube/FaceTime
55	Instagram/Zoom/FaceTime
56	YouTube/Zoom/FaceTime
57	other/Facebook/Twitter
58	Snapchat/Instagram/other
59	Facebook/Instagram/other
60	YouTube/FaceTime/other
61	YouTube/Zoom/other

For the independent variable reflecting participants' three most popular purposes for using social media (SMP Combo), a review of each possible combination of the three top purposes of social media use from nine possible choices yielded only 56 valid combinations that were selected by participants (shown in Table 8). The combination of three purposes for the chosen social media yielded the value assigned to a participant's SMP Combo variable.

Table 8

Social Media Purpose Combinations

Value	Three purposes for social media use
1	Connection/information/escape life
2	Connection/information/find humor
3	Connection/information/find entertainment
4	Connection/information/share information
5	Connection/information/share accomplishments
6	Connection/information/Other
7	Connection/escape life/find humor
8	Connection/escape life/find entertainment
9	Connection/escape life/share information
10	Connection/escape life/share accomplishments
11	Connection/escape life/other
12	Connection/find humor/find entertainment
13	Connection/find humor/share information
14	Connection/find humor/share accomplishments
15	Connection/find humor/other
16	Connection/find entertainment/share information
17	Connection/find entertainment/share accomplishments
18	Connection/find entertainment/other
19	Connection/share information/share accomplishments
20	Connection/share information/other
21	Connection/share accomplishments/other
22	Gain information/escape life/find humor
23	Gain information/escape life/find entertainment
24	Gain information/escape life/share information
25	Gain information/escape life/share accomplishments
26	Gain information/escape life/other
27	Gain information/find humor/find entertainment
28	Gain information/find humor/share information
29	Gain information/find humor/share accomplishments
30	Gain information/find humor/other
31	Gain information/find entertainment/share information
32	Gain information/find entertainment share accomplishments
33	Gain Information/find entertainment/other

34	Gain Information/share information/share accomplishments
35	Gain Information/share information/other
36	Gain information/share accomplishments/other
37	escape life/find humor/find entertainment
38	escape life/find humor/share information
39	escape life/find humor/share accomplishments
40	escape life/find humor/other
41	escape life/find humor/share information
42	escape life/find entertainment/share accomplishments
43	escape life/find entertainment/other
44	escape life/share information/share accomplishments
45	escape life/share information/other
46	escape life/share accomplishments/other
47	find humor/find entertainment/share information
48	find humor/find entertainment/share accomplishments
49	find humor/find entertainment/other
50	find humor/share information/share accomplishments
51	find humor/share information/other
52	find humor/share accomplishments/other
53	find entertainment/share information/share accomplishments
54	find entertainment/share information/other
55	find entertainment/share accomplishments/other
56	share information/share accomplishments/other

Data Cleaning Process

Prior to analysis, the data were reviewed for any missing information, outliers, and violations of assumptions. In total there were *n*=235 participants recruited who completed demographics and questionnaires. There were *n*=4 participants who did not complete all the required demographic information and *n*=20 participants who did not have the required guardian consent. An additional *n*=53 participants did not complete all the items within the anxiety, depression, and loneliness assessments. These participants' data were eliminated from further analyses. A scatterplot was generated for each variable to identify and evaluate any outliers; none were found. Following data cleanup, *n*=158 participants were identified as having complete and usable data.

Verifying Statistical Assumptions for MANOVA

There are seven assumptions that must be met to ensure the conclusions drawn from a MANOVA are statistically sound.

Assumption 1: Dependent Variables are Continuous

The three dependent variables: depression, loneliness, and anxiety are continuous in nature because each variable was generated using a combination of several Likert-type scored items, resulting in a continuous range of possible scores.

Assumption 2: Independent Variables Consist of Two or More Categorical Independent Groups

This assumption was met as both independent variables are categorical in nature. The data collected for Social Media Sites Used was based on selecting three choices out of a total of 9 options.

Assumption 3: Adequate Sample Size

G*Power indicated that 180 participants were required to ensure that results would have sufficient power and effect size. Following data cleanup, n=158 cases were identified as complete and usable. The total number of usable surveys was less than what was required by G*Power, and as such this assumption was not met. Less data can reduce the statistical value of the results, reduce the generalizability of the study and as such the results are not as valuable. Having a smaller sample makes it harder to show that the results are a good representation of adolescents who spent periods of time in isolation during the pandemic and can make it more challenging to establish whether the use of social media had an impact on these adolescents.

Assumption 4: Linear Relationship Between Each Pair of Dependent Variables for Each Independent Variable

To test this assumption, scatterplot matrices were generated and examined. Scatter Plots showing social media use and total Loneliness (Figure 1) and social media purpose and total loneliness (Figure 2) did not show any linear association between the social media used by adolescents and their current levels of anxiety.

Figure 1

Scatter Plot of Combinations of Social Media Used by Total Loneliness Score

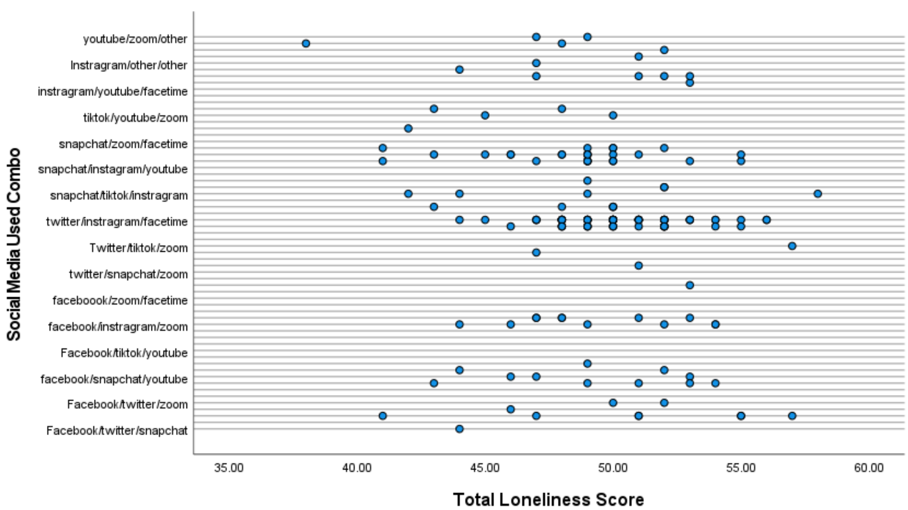
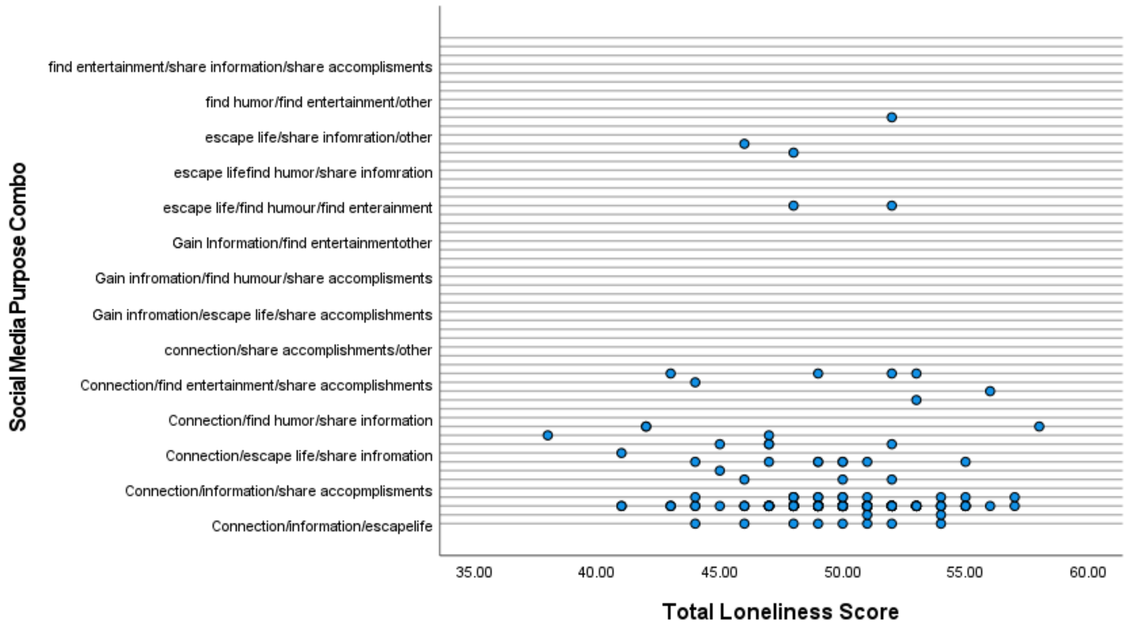


Figure 2

Scatter Plot of Combinations of Social Media Purpose by Total Loneliness Score



Scatter Plots showing social media use and total anxiety (Figure 3) and social media purpose and total anxiety (Figure 4) did not show any linear association between the social media used by adolescents and their current levels of anxiety.

Figure 3

Scatter Plot of Combinations of Social Media Used by Total Anxiety Score

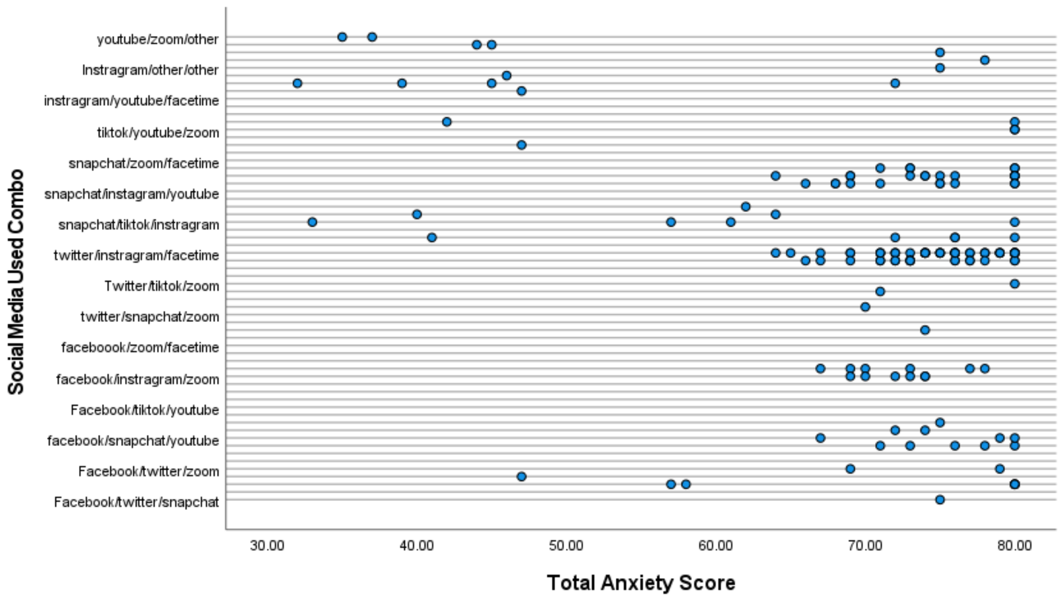
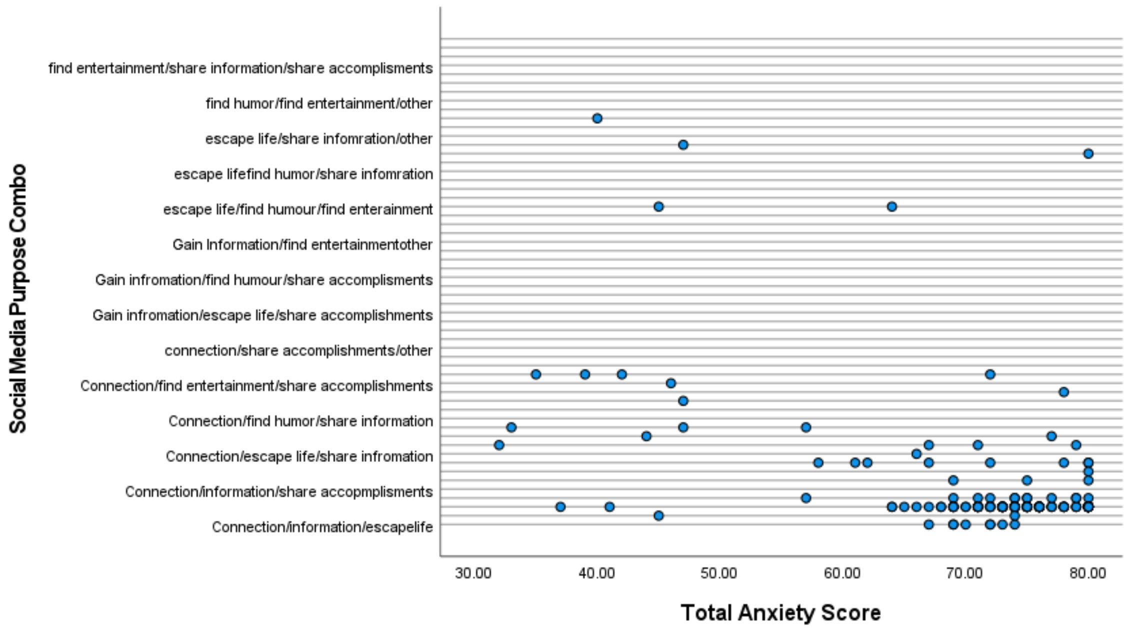


Figure 4

Scatter Plot of Combinations of Social Media Purpose by Total Anxiety Score



Scatter Plots showing social media use (Figure 5) and total depression and social media purpose (Figure 6) did not show any linear association.

Figure 5

Scatter Plot of Combinations of Social Media Used by Total Depression Score

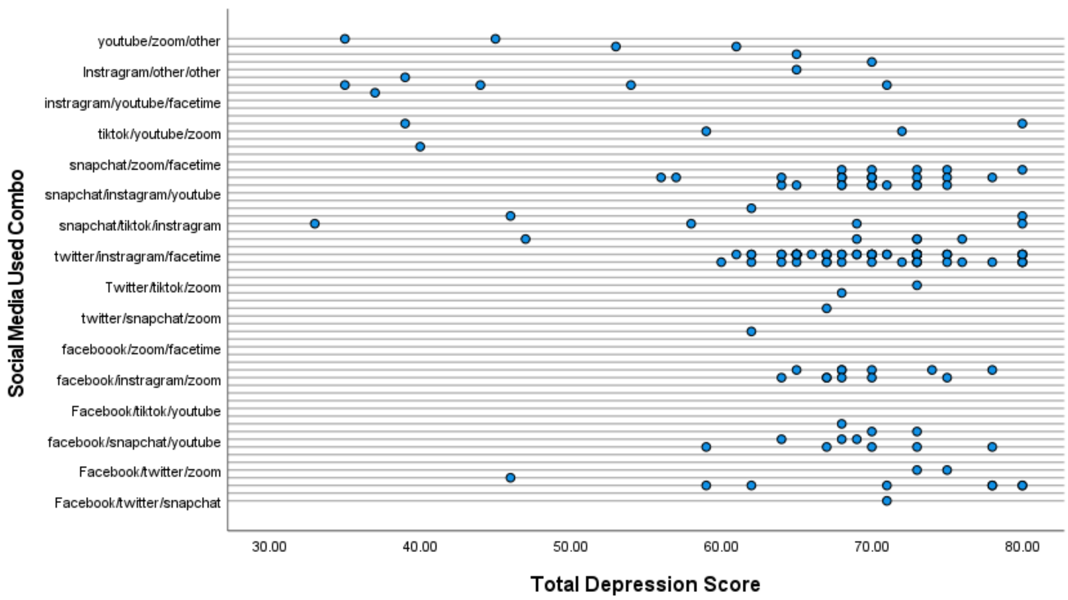
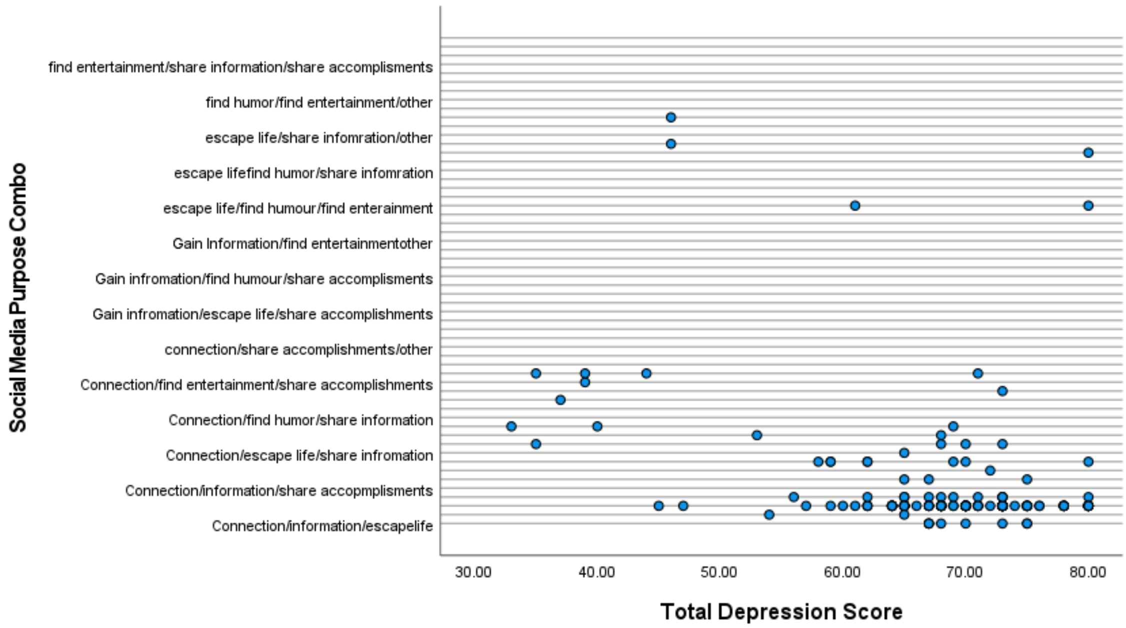


Figure 6

Scatter Plot of Combinations of Social Media Purpose by Total Depression Score



This assumption was not met. When there is no visible linear relationship between variables this can indicate that there is no correlation in the data and negatively impacts the alternative hypothesis.

Assumption 5: Homogeneity of Variance-Covariance Matrices Exists

To test the fifth assumption, a Box's M test of equality of covariance matrices within SPSS was completed. The significance between the population covariances was p=.048. To meet homogeneity there needs to be a p >.05. This assumption was not met.

Assumption 6: Absence of Multicollinearity

The final assumption of the two-way MANOVA is that there is no multicollinearity. There is a significant correlation between the two dependent variables of total anxiety score and total depression score *r=.816* (Table 9). Since a correlation exists, the sixth assumption was not met.

Table 9

Correlations of Loneliness, Anxiety and Depression

		Total Loneliness Score	Total Depression Score	Total Anxiety Score
Total Loneliness Score	Pearson Correlation	1	.061	.125
	Sig. (2-tailed)		.450	.117
Total Depression Score	Pearson Correlation	.061	1	.816**
	Sig. (2-tailed)	.450		<.001
Total Anxiety Score	Pearson Correlation	.125	.816**	1
	Sig. (2-tailed)	.117	<.001	
	N	158	158	158

***p* < .01 (2-tailed).

Assumption 7: Accurate Data

The data were reviewed manually after they were collected in SurveyMonkey. Any participants who missed questions, or did not fully complete questionnaires, were removed. Due to carefully reviewing all data, this seventh assumption can be considered met.

After reviewing the participants' data, I determined that the data did not meet the assumptions required for a MANOVA. Figures 8 and 9 indicated that almost all the depression and anxiety scores fell within the clinical range, and as such, the distribution of these scores was skewed, possibly resulting in a truncated range of scores that contributed to the violation of several assumptions. While the distribution of loneliness scores appeared more normalized (skewness = 0; kurtosis = 0), as can be seen in Figure 7, it still failed to meet most of the assumptions. Because the assumptions for a MANOVA were not met, non-parametric testing was used instead.

Figure 7

Distribution of Participant Total Loneliness Score

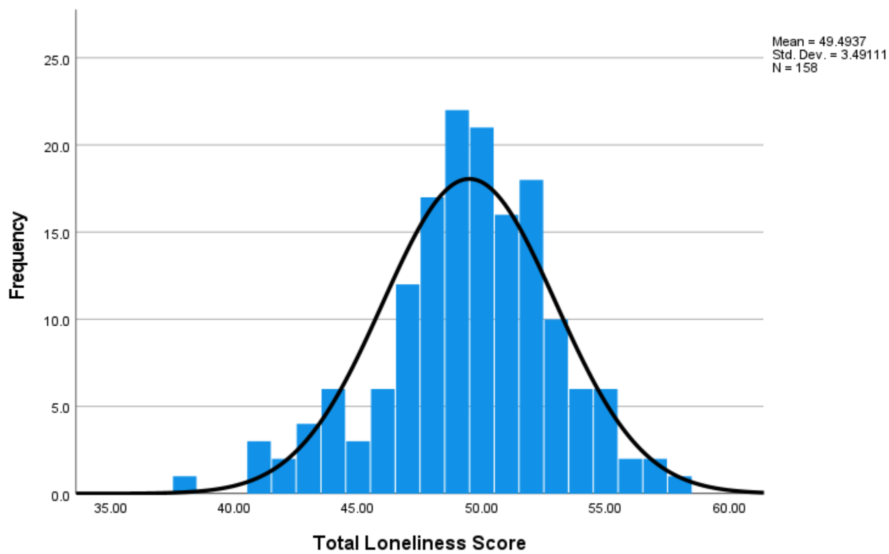


Figure 8

Distribution of Participant Total Anxiety Score

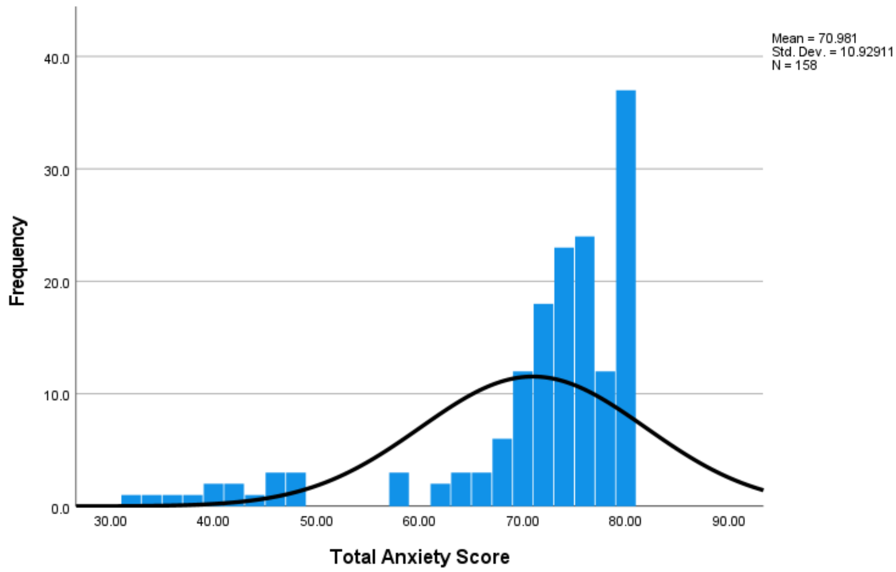
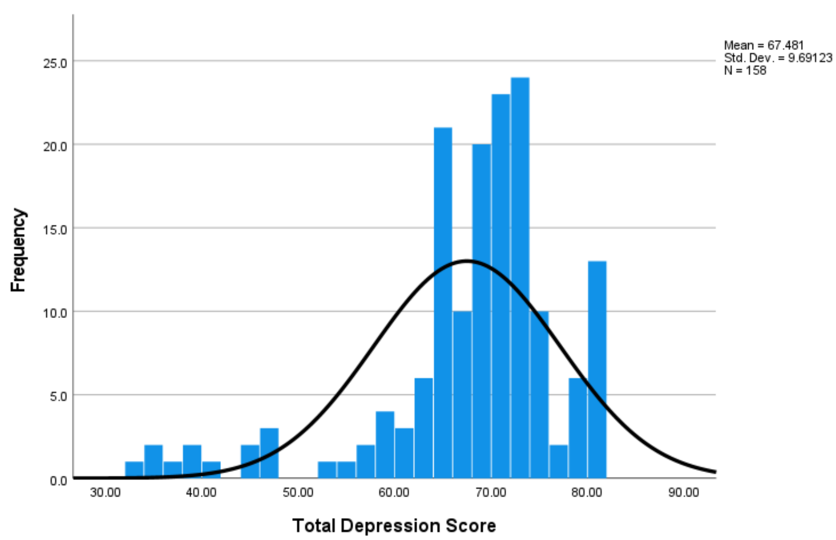


Figure 9

Distribution of Participant Total Depression Score



Cronbach's alpha was calculated for the RCADS and the UCLA Loneliness Scale to test for internal consistency. The Cronbach's Alpha for the RCADS was α=.937, indicating a high level of reliability with the data. Reliability for the UCLA Loneliness Scale was α=.594 indicating a low level of reliability with the data. The low level of reliability from the UCLA Loneliness Scale may be due to its relatively small number of items (20 items) compared to the RCADS (47 items).

Non-Parametric Analyses

Loneliness Related to Social Media

A Kruskal-Wallis test revealed no significant differences in the loneliness score ranks across the 61 groups of social media sites used: $\chi 2(33, N = 158) = 38.80, p = .224$. As a result, the null hypothesis was retained. Additionally, no significant differences were found in loneliness scores across the 56 combinations of social media purposes: $\chi 2(18, N = 158) = 13.94, p = .733$. The null hypothesis was retained.

While there was no significance in loneliness scores among the combinations of social media sites chosen or among the combinations of purposes for social media use, it is noteworthy that none of the participants' scores fell within the clinically significant range on the UCLA Loneliness Scale (see Table 10).

Table 10

Participants Whose UCLA Loneliness Score Met Diagnostic Criteria

	N	%
Mild Loneliness (20-34)	1	0.6
Moderate Loneliness (35-49)	157	99.4
Moderately High Loneliness (50-64)	0	0
Clinically Significant (65-80)	0	0

Anxiety Related to Social Media

Kruskal-Wallis tests revealed significant differences across the 61 groups of social media sites used (SMSCombo), $\chi 2(33, N = 158) = 52.95, p < .05$. The null hypothesis was rejected. Additionally, significant differences were found for anxiety across the 56 combinations of purposes for social media use (SMPCombo); χ^2 (*18*, $N = 158) = 46.48, p < .001$. The null hypothesis was rejected.

Post hoc analysis using the Dunn's test with Bonferroni-adjusted p-values for multiple comparisons revealed no significant differences in anxiety scores between the combinations of social media sites used or the combinations of their purposes. The number of comparisons was relatively high, yielding a conservative adjusted p-value of 1.00 for all group comparisons; thus, no comparisons between social media combinations were deemed significant.

It is also noteworthy that 83.5% of participants' scores fell within clinically significant levels of anxiety (Table 11). Further examination showed that the combinations of social media sites used during lockdown and associated with the highest anxiety scores were Twitter/TikTok/Zoom (anxiety $M = 80.0$, $n = 1$) and

TikTok/YouTube/Zoom (anxiety *M* = 80.0, *n* = 2); the combination associated with the lowest anxiety score was YouTube/Zoom/Other (*M* = 36.0, *n* = 2), (Table 12). The combination of social media sites that was the most frequently chosen by participants, Twitter/Instagram/FaceTime, was associated with a mean anxiety score of 75.1 (*SD* = 4.12, *n* = 45). An anxiety score of 70 or higher falls in the clinical range; an anxiety score of 65 or lower falls in the nonclinical range, and scores that fall between 65 and 70 are within the borderline clinical range.

Table 11

Frequencies and Classification of Total Anxiety Scores

Total anxiety score	*N*	%
Below clinical threshold (below 65)	24	15.2
Borderline clinical threshold (65-70)	2	1.3
Above clinical threshold (Above 70)	132	83.5

Table 12

Total Anxiety Score for Social Media Used Combination

Social Media Used Combo	*N*	Total Anxiety Score (Mean)
Twitter/TikTok/Zoom	1	80.00
TikTok/YouTube/Zoom	2	80.00
Twitter/Instagram/FaceTime	45	75.11
YouTube/Zoom/Other	2	36.00

The combinations of purposes for using social media associated with the highest anxiety scores were Connection/Escape life/Find humor (M = 80.0, n = 1), and Escape life/Find entertainment/Other (M = 80.0, n = 1); the combination associated with the lowest anxiety score was Find humor/Find entertainment/Share information (M = 40.0, n = 1). The combination of purposes for using social media that was the most frequently chosen by participants, Connection/Find Information/Find entertainment, was associated with a mean anxiety score of 74.3 (SD = 6.5, n = 102). Table 13 shows the range of anxiety scores for the social media purposes described.

Table 13

Total Anxiety Score for Social Media Purpose Combination

Social Media Purpose Combo	*N*	Total Anxiety Score (Mean)
Connection/Escape Life/Find Humor	1	80.00
Escape Life/Find Entertainment/Other	1	80.00
Connection/Find Information/Find Entertainment	102	74.29
Find Humor/Find Entertainment/Share Information	1	40.00

Depression Related to Social Media

Kruskal-Wallis tests revealed there were no significant differences among the Depression score average group ranks across the 61 groups of social media sites used (SMSCombo), χ^2 (33, N = 158) = 41.06, p = .158. The null hypothesis was retained. However, significant differences were found for depression across the 56 combinations of purposes for social media use (SMP Combo), χ^2 (*18*, N = 158) = 33.78, p = .013. The null hypothesis was rejected.

Most participants, *n*=107, had depression scores that were rated above the clinical threshold (shown in Table 14), indicating that 67.7% of the participants of this study could potentially be diagnosed with a clinical form of depression. Previous research supports this data, with adolescents who use social media being at a higher risk for depression (Vente et al., 2020).

Table 14

Frequencies and Classification of Total Depression Scores

	N	%
Below clinical threshold (below 65)	50	31.6
Borderline clinical threshold (65-70)	1	0.6
Above clinical threshold (above 70)	107	67.7

Further examination of the data yielded the following: the combination of purposes for using social media associated with the highest depression scores was Escape life/Find entertainment/Other (M = 80.0, n = 1; Table 15); the combination associated with the lowest depression score was Connection/Find humor/Other (M = 37.0, n = 1). The combination of purposes for using social media that was most frequently chosen by participants —Connection/Information/Find entertainment —was associated with a mean depression score of 69.96 (SD = 6.34, n = 102). As shown in Table 14, a depression score of 70 or higher falls in the clinical range; scores that fall between 65 and 70 indicate a borderline clinical range.

Table 15

Total Depression Score for Social Media Purpose Combination

Social Media Purpose Combo	*N*	Total Depression Score (Mean)
Escape Life/Find Entertainment/Other	1	80.00
Connection/Information/Find Entertainment	102	69.96
Connection/Find Humor/Other	1	37.00

Summary

In this chapter, I examined the results of the data analysis related to the research questions and hypotheses. Three research questions examined how the social media sites used and their purposes of use during periods of pandemic lockdown were associated with current levels of anxiety, depression and loneliness. Due to the data failing to meet several statistical assumptions associated with MANOVA, nonparametric analyses were used.

The results of the Kruskal-Wallis tests showed that there were no significant relationships between the choices of social media sites or the purpose of the chosen social media, and current levels of loneliness.

Non-parametric testing showed that there was a significant difference between current levels of anxiety and both the social media sites chosen and the purpose of social media chosen during periods of pandemic lockdown.

Study results showed that there was a significant effect in the current levels of depression and the purpose of social media use during periods of pandemic lockdown;

however, there was no significant relationship between current levels of depression and the social media sites chosen.

Despite the lack of significance in the post-hoc comparisons, it was found that those who had the highest levels of anxiety chose social media sites that differed from those who had the lowest levels of anxiety. It was also found in this study that there were some commonalities in the social media sites chosen between those with both high and low levels of anxiety.

In Chapter 5, the results are reviewed, limitations are discussed, and the potential impact for social change is explored. The chapter also includes a discussion of the study, an interpretation of the results, and recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to explore how social media used by adolescents who experienced social isolation during the COVID-19 pandemic was associated with later loneliness, depression, and anxiety. Research in this area is important because past research indicated that adolescents who experience social isolation are at risk of developing higher levels of anxiety and depression (Ciampo & Ciampo, 2021). The current study aimed to determine whether social media use could mitigate these risks and provide adolescents with an alternative means of staying connected with peers and their community during periods of physical isolation.

Nonparametric testing examined the relationships between two independent variables (social media use and the purpose of social media during lockdown periods) and each of the three dependent variables (loneliness, anxiety, and depression). The results indicated that there were no differences in loneliness scores between the 61 combinations of social media sites used or between the 56 combinations of purposes for using social media. The same held for depression scores between the combinations of social media sites used: there were no differences. However, differences were found in anxiety scores between the combinations of social media used and between the combinations of social media purpose. Differences were also found for depression scores between the combinations of purposes for using social media.

Within this chapter, the results will be reviewed, limitations will be discussed, and the potential impact for social change will be explored. The chapter also includes a discussion of the study, an interpretation of the results, and recommendations for future research.

Interpretation of Findings

Previous research has shown that adolescents who use high amounts of social media are at a higher risk of developing depression and anxiety (Khalaf et al., 2023). The use of Facebook, for example, has been linked with higher rates of depression in adolescents (Zagorski, 2017). Post hoc testing indicated that in this current study, most of the participants indicated that they chose YouTube and Zoom as their primary sites used during periods of lockdown. The participants who had the highest scores of anxiety also indicated that they chose TikTok as one of their primary sites used during periods of lockdown; TikTok was not chosen as a social media site associated with the lowest anxiety score

Virós-Martín et al. (2024) completed a study in which adolescents self-reported how much time they spent on TikTok, the type of content they watched, and their digital well-being, which referred to a balanced individual experience of digital consumption. The study from Virós-Martín et al. contradicts what was noted in this current study, in that adolescents all felt that their digital well-being was high, and that they were not struggling with any consequences after spending nearly 2 hours per day scrolling TikTok. (Virós-Martín et al., 2024). Additionally, according to Virós-Martín et al., those who reported having higher digital well-being used TikTok for connecting with others around dance, travel, trends, music, and related activities. In the current study, those who had lower levels of anxiety and depression reported using social media for connecting with others as well as sharing information. These reports align with Virós-Martín et al.'s findings that there may be some connection between lower levels of anxiety and depression when TikTok or other forms of social media are used for connecting with others as well as sharing information, with the potential of reducing mental health concerns if faced with periods of social isolation.

Bilali (2025) used the TikTok Addictions scale to examine problematic use (meaning they had a harder time controlling their social media use) and its impact on participants' anxiety and depression. According to Bilali's findings, adolescents who were spending closer to 2.5 hours a day on TikTok were struggling with higher levels of addiction-like symptoms. Although this current study did not look at time spent on social media, as with Bilali's research, the current study also showed that participants with high levels of anxiety identified TikTok as one of their primary social media sites used during periods of COVID-19 lockdown. The current study supports data from research that has been done with respect to the fear of missing out (FoMO; Fabris, 2020) and newer research from Bilali (2025) that also talks about FoMO. Previously, research indicated that Facebook created the FoMO with adolescents (Fabris, 2020); however, as TikTok has become more favored by adolescents, research is indicating that anxiety and depression are high in adolescents who choose to use this site. Such literature supports the data from this current study, which indicated adolescents have clinical levels of anxiety and depression, and one of the social media sites most used during periods of COVID-19 lockdown was TikTok.

Adolescents reported average results regarding loneliness, which is promising, as this finding runs contrary to research conducted prior to COVID-19. Prior research has shown that adolescents who spend a large amount of time on social media are more likely to experience higher levels of loneliness (Primack et al., 2017). Although the results run contrary to what has been seen in the past, it begs the question that when faced with no other option other than to be able to connect with others through social media for an extended period of time, could social media have some benefit in reducing loneliness and supporting the social needs of adolescents?

Research has shown that there is an impact on a person's mental health and risks for depression when using social media (Plaisime et al., 2020). There are some positive benefits to its use, such as allowing people to express their thoughts and feelings and to receive social support (Anderson & McCabe, 2012). Social media use can still cause an increase in mental health concerns such as depression (Keles et al., 2020).

Bloemen and De Coninck (2020) spoke to an adolescent's desire to remain in contact with others and a FoMO on events or updates that are happening with others. During the pandemic, the ability to remain in face-to-face contact with peers was taken away during times of mandated lockdown. The use of social media was one way for adolescents to stay in contact with others as well as continue to know what is going on in their communities and with their peers. The purpose of the social media given for social media use is consistent with FoMO; however, this does put adolescents at higher risk of social media addiction, as well as increased depression (Bloemen & De Coninck, 2020).

Previous research has also shown that social media use causes an increase in anxiety, and those who spend time on social media are more likely to develop social anxiety and even depression (Lai et al., 2023). This is thought to be due to the negative comments that can be seen on a person's posts, being bombarded with messages on multiple social media sites, due to the pressures that a person may feel to continue to make posts and content, as well as just being more aware of what others are doing all of the time (Lai et al., 2023). Zagorski (2017) spoke to how anxiety and depression levels can be more related to the choice of social media sites being utilized. In the current study, the number of participants who had clinical levels of anxiety and the significant relationships among the independent variables and anxiety support previous research on adolescent social media use and increased anxiety.

This study noted that adolescents with some of the highest scores for anxiety and depression utilized sites such as TikTok and Twitter. This information connects with other research that showed TikTok can create more concerns around the mental health of adolescents (Conte et al., 2025). Most participants in the current study had scores that placed participants above the clinical threshold for anxiety. Overall, participants most often reported that the main reason for social media use among participants who had the highest anxiety scores was finding a way to escape life. Although no previous research speaks to this specifically, it was of interest to see that so many adolescents were looking for a way to escape what was happening around them during the pandemic lockdown.

Clarke-Pearson et al. (2011) spoke to how the use of social media can increase adolescents' risk of developing anxiety and depression. This increase in anxiety and depression can put them at risk of entering adulthood without understanding how to build and maintain healthy relationships with others (Chung, 2018). It is concerning that most adolescent participants' responses on the RCADS placed them at clinical levels of anxiety and depression. High levels of anxiety can impact adolescents' ability to move forward into successful, well-adjusted young adults (Pedrini et al., 2010). Adolescent anxiety can interfere with establishing vocational identity (Chávez, 2016), developing substance use disorders, and other high-risk behaviors (Pedrini et al., 2010), and possibly being unable to make the important social and relationship connections that are expected at this stage of life (Rageliene, 2016).

Limitations of the Study and Recommendations for Future Research

There were several limitations that could have affected the results and their interpretation. This study did not meet the minimum number of participants as recommended by G*Power (n=180). Following data cleaning, 152 surveys were deemed usable. A sample that is smaller than recommended may have insufficient statistical power to answer the primary research question, leading to a higher likelihood of a Type 2 error (Andrade, 2020).

Within this study, I did not collect information on how much time per day was spent using social media, due to limitations in participants' ability to accurately recall social media use as early as March 2020, when the first pandemic lockdowns occurred. However, if accurate information could have been obtained, time spent on social media might have served to moderate the associations between social media use and anxiety and depression. Excessive media use is associated with adverse mental health outcomes

(Virós-Martín et al, 2024). Additionally, such information could inform the degree to which social media habits have changed due to social isolation. Delogu et al. (2025) found that adult social media use increased during the pandemic compared to pre-pandemic levels. Research completed by Nagata et al. (2022) found that teens spent more time online as a result of being under lockdown. The study by Nagata et al. (2020) examined total screen time, as well as the types of use, including streaming, multi-player and single-player gaming, social media, texting, video chatting, and browsing the internet. Results from this study indicated that even after pandemic restrictions were lifted, adolescents' time online remained the same and that they did not reduce their use. It was also noted that adolescents used screen time to reduce stress and anxiety; however, these adolescents were more likely to spend more time online versus adolescents who used social media for social connection and were reported to have higher coping behaviours (Nagata et al., 2020). Although the current study did not look specifically at how much time was spent online by the participants, it was noted that those who used social media to connect with others showed lower levels of depression, and this is supported in the research also done by Nagata et al. (2020).

Another limitation was the large number of response combinations created by asking participants to list three social media platforms and their purposes. comparisons. Future research should increase sample size and limit the number of platform selections to reduce response variability.

There is room for further research on the topic of how social media could be used to support adolescents in times of isolation. Recommendations for further research would include ensuring a sufficient sample size of participants, as this impacted the results due to a lack of data and potential significance within the IVs and DVs.

Future research related to choices of social media sites and their purposes could limit participants to only one option for each, thereby eliminating combinations and allowing for more concise comparisons to specific sites and purposes.

It would be valuable to use a more detailed assessment tool for loneliness, depression, and anxiety. I used screening instruments that indicate a potential concern for loneliness, depression, and anxiety; future research could include more diagnostic assessments. Such diagnostic assessments would be supported by conducting the interviews in person rather than online.

Most of the participants scored at clinical levels of anxiety and depression. This is concerning, and further research would be beneficial, as clinical levels of depression and anxiety in adolescents can lead to further risk factors such as substance use, self-harm, higher levels of suicidal ideation, and developmental gaps as adolescents move into young adulthood (Goosby et al., 2013). Also noteworthy in this study was that the levels of loneliness did not fall within the clinically significant range. Al though there was no significant relationship between loneliness and social media use during pandemic lockdowns, it would still be beneficial to explore further why loneliness levels after the pandemic were within the normal range. Further research could compare adolescents who had access to the internet against those who did not have access and were possibly forced to find alternative ways to communicate with peers.

Finally, asking participants for more specific timelines of how much time per day they were spending online would be valuable, as this would allow for comparisons to be made around how much time was spent on social media and the different levels of loneliness, anxiety and depression.

Implications for Social Change

This study provided meaningful implications for positive social change. The current study can provide information that helps caregivers, educators, mental health professionals, and even adolescents themselves understand the role that social media can play during periods of isolation. This study has identified the sites used and the reasons behind their use during periods of COVID-19 isolation.

More research should be done specifically on specific social media sites and long-term mental health concerns. Conversely, social media use should be explored further, and with a larger sample size, to examine whether social media provides some protective factors related to adolescent loneliness.

This study is one of the first that specifically examined adolescents' use of social media during extended periods of isolation and their subsequent levels of loneliness, anxiety, and depression. This study found that most of the participants had clinically significant levels of anxiety and depression, supporting prior research that social media use can increase these conditions. This study allows academics, caregivers, educators and mental health professionals to see if social media sites and the purpose of their use would have any impact, either positive or negative, on the mental health of adolescents who lived through periods of forced isolation. When looking at the potential long-term consequences of adolescents not being able to engage with peers and loved ones and recognizing that the majority of participants rated in the clinically significant levels of anxiety and depression, it becomes evident that adolescents are going to more than likely require support to manage any lingering effects from the COVID-19 pandemic.

There will most likely be a need for interventions from mental health professionals, caregivers, and educators that include therapeutic interventions for clinical levels of anxiety and depression, support to have positive social interactions with peers, as well as moving into becoming young adults that are healthy and well-adjusted with no lingering effects from periods of forced lockdown and isolation.

The implications of the study highlight the need for further research into the long-term mental health impacts on children and youth due to the pandemic. Further research could explore whether adult development was negatively affected by having experienced the pandemic as children and adolescents.

This study provides additional data that can be used further to explore variables such as location during the pandemic, the duration of lockdown periods in their community, as well as gender, age, and grade level. The data could provide more information, such as higher risks due to location or protective factors. There was a small group that was not within the clinical range for anxiety and depression; it would be valuable to go through the data further to see what the protective factors (if any) were present for these adolescents to remain in the non-clinical ranges of anxiety and depression.

This study found that levels of loneliness were lower than expected, indicating that individuals used social media to reach out to others, particularly those who used social media sites that encourage this. The study also revealed that adolescents post-pandemic have remarkably high levels of anxiety and depression. This is important to know, as it means that caregivers and professionals will likely see an increase in mental health needs.

Social media has become a significant part of how adolescents communicate and engage with their peers. It is essential to recognize that online communication is more prevalent than in-person interactions among adolescents (Christofferson, 2016). It is important to recognize that not all interaction through social media is negative, that some positive things such as self exploration, meeting new people and being able to share information is very valuable, however there is still concerns around cyber-bullying and teens being groomed online, and the impact that this can have on mental health (Christofferson, 2016).

Studies such as the current one contribute to positive social change in the world and communities by providing data on important topics, enabling support for children and families in finding solutions to reduce risks for adolescents. Finding solutions that benefit adolescents' development further ensures that moving forward, adolescents become productive citizens. Finding solutions for families and professionals empowers them to raise and support children in the community, allowing them to feel heard and understand that they have researched solutions and have a deeper understanding of the problem of isolation, which can occur for various reasons. This ensures that they can continue to support these adolescents in their healthy development.

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Appendix A: Participant Demographic Questionnaires

Please go through the survey one question at a time and use the drop-down menus to answer the questions and complete the survey. Please answer with current information that applies to you at the time you are taking this survey.

1. Current age: (drop down menu with ages offered of 13 years to 18 years of age).
2. What sex were you assigned at birth on your birth certificate: (drop down with Male, Female)
3. Current Academic Grade: (drop down with grades 6 to 12).

5.Current Country of Residence: (drop down menu with Canada (Drop down menu with 10 provinces and 2 territories) or United States (drop down menu with all 50 states).

4. Family Composition

How many adults in your home (Drop down menu up to 10)

Number of siblings (drop down menu with numbers up to 10)

5. How many months of lockdown or movement restriction did you experience? (Drop down menu with 0 to 24 months offered).
6. Did you have reliable internet service during the time you experienced periods of lockdown? (Drop down menu with yes or no).
7. Have you had any events in your life post COVID-19 Pandemic that have increased anxiety, depression or levels of loneliness? (Drop down menu the following options: family separation, moving to a new community, changing schools, a death in the family, death of a family pet,

Appendix B: Social Media Sites Accessed During Periods of COVID-19 Lockdown and Purpose of Use

Using the drop-down menu please list the top three sites that were accessed by you during periods of COVID-19 lockdown. Under each site chosen please select the reason for using this site.

Social media site choices include:

a. Facebook
b. Twitter
c. Snapchat
d. Tik Tok
e. Instagram
f. YouTube
g. Zoom
h. FaceTime
i. Other.

Purpose of social media use include:

a. to connect with friends and family
b. to gain information
c. to escape life temporarily
d. to find humor
e. to find entertainment
f. to share information with others

g. to look for help with my problems

h. to share my accomplishments

i. other.

Appendix C: Permissions From the Author of the RCADS

Yes, go ahead and use however you need to for dissertation. Please read the user's guide, and you are welcome to administer it online (many people do, especially now).

Best wishes,

(Author of RCADS)

On Sun, Aug 29, 2021 at 11:10 AM (researcher) wrote:

Hello (author of RCADS)

I am reaching out to you as I am currently working on my proposal for my research study that I would like to do on the impact of social media use on loneliness, depression, and anxiety in adolescents, during periods of lockdown during Covid-19.

I believe that your RCADS instrument would be a good fit for my study, and although it is noted in the terms of use that you support its use in research I still wanted to reach out and get your permission in using the instrument.

I also am wondering if the instrument has been used in an online format. Due to Covid-19 and the desire to keep participants safe I am looking at having the participants complete the survey and psychometric tools online. I am wondering if this has been done yet with the RCADS.

Thank you for your consideration, as someone who has also used the Spence Anxiety Scale in my practice, I was quite excited when I came across the RCADS, and how effective it appears in measuring both depression and anxiety in children and youth.

Thank You

Appendix D: Permission to Use the UCLA Loneliness Scale

Hi (researcher)

Thank you for your email. You are welcome to use the scale. All materials on SPARQtools are free for noncommercial use. We recommend you cite the original study, and we would appreciate you crediting Stanford SPARQ. Let me know if you have further questions.

Best,

Research Manager

Stanford SPARQ

Hello

I am looking to find out where I can reach someone that can tell me if I need permission from Daniel Russell with respects to using the UCLA loneliness scale. I am hoping you can help me get in contact with him, or someone that can assist me with this.

Thanks so much for your time,

(Researcher)