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ADOLESCENT MENTAL HEALTH IN THE TIME OF COVID-19: A REFLEXIVE THEMATIC ANALYSIS OF SOCIAL CONNECTEDNESS AND TECHNOLOGY USE

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**Adolescent Mental Health in the Time of COVID-19: A Reflexive Thematic Analysis of
Social Connectedness and Technology Use**

Synopsis:

The present explored the meaning of social connectedness and mental health concerns as experienced among diverse adolescents in secondary schools during the COVID-19 pandemic. Data was collected in the Fall of 2022 from three schools in British Columbia, Canada, via CyberTeens Wave 3 online survey using open-ended text response questions about adolescents' feelings of social connection in the time of COVID-19. Reflexive thematic analysis was used to explore open-ended text response qualitative data related to peers, school connectedness and technology use among adolescents. Youth who felt negative feelings appeared to struggle to conform to peer groups' norms around technology use, whether that use was commonplace or whether peer group norms centred around in-person connections or a mix of both. Racialized youth did not appear to possess a unique experience of COVID-19 and peer connectedness; experiences were highly individual. By administering the survey to over 3000 youth, we were able to show that 'thin' survey responses can yield incredibly rich data yielding to conceptual analyses.

Abstract

Background: The daily lives of adolescents were restricted and affected by the COVID-19 pandemic. These experiences had various negative impacts on the mental health of adolescents. The present study explored the meaning of social connectedness and mental health concerns as experienced among diverse adolescents in secondary schools during the COVID-19 pandemic.

Methods: Adolescents (n = 3216; 44.6% women) in Grade 8 to Grade 12 participated in the present study. Data was collected in the October and December, 2022 from two schools in British Columbia, Canada, via an open-ended question asking adolescents' feelings about social connection in the time of COVID-19. Reflexive thematic analysis was used to explore the qualitative. **Results:** Four themes regarding adolescents' experiences in COVID-19 were identified: 1) The kids are all right; 2) Technology was essential to social connections; 3) Processing loss; and 4) Things are getting better now. **Discussion:** Study findings indicated that adolescents were overwhelmingly resilient, with more positive appraisals of connectedness than negative ones, and many of them experienced growth from adversity due to COVID-19 restrictions. However, for connections to thrive, individuals had to be willing to utilize technology to keep up with peers. Youth who felt negative feelings appeared to struggle to conform to peer groups' norms around technology use, whether that use was commonplace or whether peer group norms centred around in-person connections or a mix of both. Many comments referred to falling out of practice in being social, initiating, and maintaining connections, which were slowly overcome as 'things returned to normal.' Our findings support that connectedness with others is more like a verb than a noun; it must be rehearsed, practiced and engaged thoughtfully to sustain its benefits. Racialized youth did not appear to possess a unique experience of COVID-19 and peer connectedness; experiences were highly individual.

By administering the survey to over 3000 youth, we were able to show that ‘thin’ survey responses can yield incredibly rich data yielding to conceptual analyses.

Keywords: Adolescents, Internalizing Mental Illness, Information and Technology Use, Reflexive Thematic Analysis, Race

Adolescent Mental Health in the Time of COVID-19: A Reflexive Thematic Analysis of Social Connectedness and Technology Use

How did young people stay socially connected during the global coronavirus (COVID-19) pandemic? The COVID-19 pandemic had a worldwide impact with varying consequences to young people's mental health (World Health Organization, 2022). The public health restrictions, such as limiting physical and in person social interactions, created a risk of socially disconnected adolescents. Adolescents are developmentally much more focused on social goals (Wu et al., 2016), but this social support also helps young people cope with uncertainty and difficult situations. As such, impeded face-to-face interactions and increased social distancing due to public health restrictions, had negative psychological consequences on young people across the globe (Sundler et al., 2023). Indeed, a recent systematic review and meta-analysis revealed there was an increased likelihood of anxiety and depressive symptoms among adolescents due to the pandemic (Miao et al., 2023). A systematic review also indicated that Black, Hispanic, and Asian individuals were at increased risk of COVID-19 and hospital admissions in comparison to White individuals (Magesh et al., 2021), suggesting that sociodemographic factors such as race and gender likely influenced the lived experiences among adolescents during the pandemic, thus heightening the impact of negative health outcomes. Yet, technology and online activities provided adolescents with an opportunity to stay connected day-to-day during the lockdowns and remote schooling during pandemic (Gadassi Polack et al., 2021). The present exploratory study delved into the qualitative lived experiences of secondary school students during the COVID-19 pandemic, with a focus on their mental health, social connectedness, and technology use.

Social Connectedness

It is well established in developmental literature that a sense of social connection is foundational for establishing strong, lifelong interpersonal bonds (Wu et al., 2016). The importance of meaningful relationships can be observed in a range of conceptual developmental frameworks, such as social capital (Putnam, 2001), attachment (Bowlby, 1979), coping strategies (Ayers et al., 1996), and resiliency (Rutter, 2012). While a similar concept of “sense of belonging” dates back to 1990s, interest in social connectedness stemmed from Resnick and colleagues’ (1997) seminal work that indicated family and school connectedness strongly predicted negative psychological consequences among adolescents (e.g., emotional distress, suicide ideation, aggression, and substance use). *Social connectedness* refers to the feeling of being a valued member of a social network in which one feels cared for and receives help when in distress (Taylor, 2011). It is common for adolescents to balance between their need to feel a sense of social connectedness with their desire to create their own sense of identity and individuality (Margalit, 2010).

In the digital age, peer relationships are not just limited to those that occur via the school system; and it is now recognized that a lot of peer socialization is happening in online contexts (Balley’s et al., 2020) . These social connections provide not only emotional support for adolescents but also a sense of belonging, identity, and camaraderie. Similarly, school connectedness, or the sense of belonging to one's educational institution, is another vital protective factor for youth (Waters et al., 2010). School serves as a fundamental component for many, especially for diverse youth populations, offering not only academic growth but also social and emotional development. These protective factors can potentially bolster the ability of youth to adapt, cope, and thrive in the face of life's challenges, including those experienced

during the COVID-19 pandemic (Waters et al., 2010). By looking at the protective factors of social connectedness, the present research seeks to provide a nuanced understanding of the social dynamics at play in the lives of youth. Social connectedness are not mere counterweights to mental health concerns, but represent essential elements of resilience and mental well-being in the emerging digital generation. Social connectedness has garnered attention in the present study as a potential protective factor among adolescents during the global pandemic.

Technology Use among Youth

Although the vast amount that adolescents spend online is worrisome for parents and educators alike (Subrahmanyam & Greenfield, 2008), technology also offers a means of social connection and entertainment. Indeed, technology played critical role in helping adolescents' meet their social needs during the COVID-19 pandemic. For example, a Canadian study indicated that young people connecting with others online was a beneficial way for them to cope with feelings of loneliness during the initial COVID-19 lockdown (Ellis et al., 2020). This is in line with previous study findings that indicate young people often utilize social networking sites to foster a sense of social connectedness (Michikyan & Suárez-Orozco, 2015). However, despite these protective factors, extreme technology use may exacerbate young people's feelings of social disconnection. More specifically, *problematic technology use* refers to a compulsive pattern of device use that is associated with shame and guilt, interferes with school and/or work, and increases the likelihood of negative psychological consequences (Horwood & Anglim, 2018). To this end, research evidence has shown an association between internalizing mental illnesses, such as depression and anxiety, and maladaptive technology use (Elhai et al., 2017). These types of mental health concerns can have profound, long-lasting consequences for youth who are grappling with the pressures of education and peer relationships in online and offline contexts

Therefore, while technology use may be a protective means for adolescents to enhance a sense of social connectedness during the COVID-19 pandemic, the increased screen time may have elevated feeling socially disconnected.

Current Study

The COVID-19 pandemic restricted in-person social interactions, which hampered the developmental need for social connection among adolescents in an unprecedented way. This work aims to better understand adolescents' sense of social connectedness during the COVID-19 pandemic. In addition, given the potential role for technology to both be adaptive and maladaptive in terms of social connection, a secondary aim was to explore the role that technology played during the pandemic. Quantitative research has revealed that the COVID-19 pandemic increased internalizing mental health problems among adolescents (Miao et al., 2023), but to date, there is yet to be a qualitative exploration of diverse adolescents' lived experiences of social connection during the COVID-19 pandemic. This research aimed to fill this gap by exploring qualitative self-report data about young people's social connections in the time of the COVID-19 pandemic. The main research question that guides this exploratory work is: What was the lived experience of connection with others for a group of racially diverse high school students during COVID-19 pandemic?

Method

Study Context

Data for the present study was drawn from one wave of data collected as part of a larger longitudinal research project, The CyberTeens Research Project, which was conducted in British Columbia (BC), Canada. Participants for the current study were from two secondary schools across two public school districts. One school was located in a large urban city while the other

was located in a rural community. Pseudonyms were used in the writing of this study to protect the anonymity of the respondent. The institutional ethics review board approved the research design and protocol for this study.

Participants

The study sample was comprised of 3216 secondary students (44.6 % identified as female, $M = 15$, $SD = 1.47$,) in Grades 8 to 12 between ages 11 to 18. A passive parental consent procedure was used to assist with obtaining a representative sample within each school (Shaw et al., 2015). For the purpose of the present study, only participants who provided a response to the open-ended question were included in the analysis. Of 3216 completed surveys, 2669 students answered the open-ended question, yielding a response rate of 82.9%. Participant characteristics are shown in Table 1.

Table 1
Sociodemographic Characteristics of Participants

Baseline characteristic	<i>n</i>	%
Gender		
Girl	1433	44.6
Boy	1507	46.9
Transgender	64	2
Non-binary	97	3.0
Two-spirit	18	.6
Not sure/I don't know	98	3.0
Not listed	79	2.5
Grade		
Grade 8	640	19.9
Grade 9	635	19.7
Grade 10	686	21.3
Grade 11	602	18.7
Grade 12	540	16.8
Ethnic Background		
Indigenous	119	3.7
South Asian	177	5.5
East Asian	1248	38.8
Southeast Asian	665	20.7
West Asian	69	2.1
White	794	24.7
Latin American	183	5.7
Black	74	2.3
Other	134	4.2

Note. *N* = 3216. Number of participants identifying with the characteristic, percentage of sample identifying with the characteristic.

Procedure and Data Analysis

After obtaining youth assent, participants completed the CyberTeens survey during school time using their own personal mobile devices. The CyberTeens survey was self-administered using an online software tool called Qualtrics (www.Qualtrics.com) and took participants approximately 30-45 minutes to complete. Teachers oversaw the data collection process, and research assistants were accessible to address survey-related queries through Zoom, Microsoft Teams, and/or text messages. The full CyberTeens questionnaire included approximately 180 items consisting of questions about their online life, wellness and learning, and socio-demographics. As a thank you for completing the study, every student from each school involved was included in a draw for an opportunity to win a smartphone. Data for the current study was collected independently at each school during the period from October to December 2022. The current research examined open-ended question related to COVID-19. This open-ended and topic-based question was presented in a fixed and standard order to all participants. The open-ended survey question was, "Given the ongoing context of COVID-19,

tell us in your own words how you feel personally and how you get along with and connect with others since the start of this school year?" This qualitative question captured COVID-19 experiences in participants' own language and terminology. As such, participants' responses were brief and simple as observed in short text messages.

Reflexive thematic analysis, as articulated by Braun and Clark (Braun & Clark, 2006), was applied to the qualitative data. The first author analyzed the data and the rest of the team provided analytical input. To begin the analysis, the authors reflected on their positionality in relation to the research. The first author identified her positionality to the research topics pertinent to this research, namely connectedness to others during COVID-19 and the use of digital technologies:

As a first-year doctoral student, having worked remotely and then in hybrid arrangements for nearly three years, I was slowly learning how to be social again and was very glad about the opportunities for socialization provided by my department. Being the sole caregiver to a young child during the COVID lockdown was challenging due to the lack of opportunities for connections with colleagues and friends, and I begrudgingly used social media, texting, media and the old-fashioned phone calls to stay in touch with friends and family. I was waiting for normal life to return, where loneliness and boredom were not daily struggles. Upon reading the responses to the survey, I was attracted to youths' statements that mirrored my existence. I was very surprised to learn that most young people endured COVID restrictions with little disruption to their social lives and sense of connectedness. I tried to uncover why some youth shared my doom and gloom existence, and others appeared to even thrive in our digitally-imposed reality. Having never analyzed open-ended survey responses using thematic analysis and needing a

greater sense of coherence in the data that I was used to, I attempted to bin the myriad of individual and often contradictory experiences into meaningful categorical units of analysis.

The second author is a Masters graduate student in the Human Development, Learning and Culture program. Her research interests include technology use, suicide ideation, resiliency and internalizing mental illnesses amongst the undergraduate university population. She has experience working in a variety of higher education roles including student housing, health and wellness, recruitment, as well as academic and career development. She hopes to use her educational and career background to advance mental health and well-being for young adults to be more resilient to life's stressors. The third author is an assistant professor and Michael Smith Health Research BC Scholar. She works in the Department of Educational and Counselling Psychology, and Special Education (ECPS) with the Faculty of Education. She is interested in life-course perspectives to promote the wellbeing of diverse adolescents in offline and online spaces. The fourth author is a postdoctoral fellow in ECPS. Her program of research is focused on socio-emotional functioning and developmental psychopathology. The final author is the Primary Investigator of this study. Her program of research is in the area of developmental psychology, and she is particularly interested in the impact of what it means to grow up with technology by examining the impact of the internet on social and cognitive development.

The second step involved becoming familiar with the data. To do this, all open-ended responses were alphabetized by first letter to identify one-word answers or short responses, such as 'good,' 'I don't know,' and 'I'm fine' and to account for any grouping of responses by school. These statements were included in the preliminary analysis. Statements not yielding informative data or data that did not answer the question, such as 'cheeseburger', descriptions of irrelevant

events (i.e. conquering the world) and answers yielding only visual elements like emojis were set aside (n = 22). Initial impressions of the data were recorded which, in addition to very individual descriptions of their experiences during and after COVID-19 lockdown, youth wrote of change and getting back to normal, striving for connection, the importance of friends over family, finding one's 'tribe'. Youth also wrote of loss of connections, and loss of self. A total of 2669 responses were analyzed.

To see if any patterns or repeated units of meaning were emerging in the data based on ethnicity, the above analyses were redone for each ethnic group (Indigenous n = 7, East Asian n= 887, West Asian n= 879, South East Asian n= 120, White n =551, South Asian n=117, and Latin American, n=108). The data yielded the observation that some students were responding and adapting to COVID-19 restrictions as an adverse event. In contrast, others did not perceive the COVID-19 restrictions as detrimental to their wellbeing. This prompted a foray into the literature on resiliency curves, adaptation and adversity. The data, for all ethnicities, were re-analyzed based on the emotional tone of the answer provided. This approach was inspired by the various stages and emotional changes individuals often experience as they navigate change or difficult circumstances as articulated by many theories, models and empirical research such as depression or sense of loss, adaptation and growth and resolution and positive affect (Luhmann et al., 2012; Grafton et al., 2010; Taylor et al., 2010; Niemiec, 2020). The following semantic codes were created: neutral (i.e. I use social media to connect); negative (i.e. 'I felt I was going to lose my mind stuck in my house for two years'); positive (i.e. 'Covid was all right; I stayed connected to friends') and growth-orientation (ie. 'During Covid, it was really bad but it gave me a chance to learn about myself and make new connections via social media'). To reach greater analytical and conceptual clarity, responses with three words or less were excluded from this round of analysis

(i.e. I feel fine, I feel good, I feel bad, Covid is bad, etc). Specific latent and semantic codes emerged based on the remaining responses. The data across all ethnicities were re-coded based on these finalized codes, and themes linking the codes were generated based on 1633 responses.

Results

The open-ended question produced a lively response about social connectedness among participants in the COVID-19 pandemic. Grade level, ethnicity, and/or gender have been reported in the results, if demographic information was provided by participants. Brevity of responses by participants resulted in some quotes being embedded in text within the results section. Participants generally provided a single response to the open-ended question, which may have included text message slang. Typos and misspelled words have not been corrected in the reported quotes. Instead, results have been reported in the participants own words and texts. The following four themes were refined from semantic and latent codes: 1) The kids are all right; 2) Technology as essential to social connections; 3) Processing loss; 4) and, Things are getting better now.

The kids are alright

The diversity of responses among students indicated that social connectedness during and shortly after COVID restrictions were lifted was an individual experience for participants with no two experiences the same. The data set contained many contradictory statements, for example: "COVID didn't change the fact that getting along with classmates and connecting with others was easy" (Thomas, aged 13) and "Covid really did mess a lot of things, I feel that if Covid wasn't there I could have achieved more and made more strong bonds with friends" (Albert, aged 17).

There was however, an overwhelming number of positive statements (n=676), compared to negative (n=329), neutral (n=312), or growth-oriented statements, in which students describe a bad situation or their feelings that become better over time (n=316). Most youth surveyed appeared to have adapted to life under COVID-19, but for many, no adaptations were required as life went on as usual:

I feel normal, and I don't think the pandemic has affected me mentally a whole lot. At the start of the school year I would just talk to friends in my classes or people I already know (Robert, age 15).

Similarly, a young man in Grade 11 described how daily life remained relatively stable during the COVID-19 pandemic:

Nothing has changed for me. My work drive has helped me keep up with online schooling, and my friend group is a bunch of people that love school. I feel more connected at school than at home (Timothy, age 17).

Technology as essential to social connections

The majority of comments referred to peer group inclusion and the role of peers, and less importance was placed on school climate or family connections. Regardless of the source of support and connectedness, however, technology was central and strongly associated with social connections. Students who by choice did not endorse technology usage felt left out of social life:

I feel I have gotten along well with my peers and friends since the start of the school year. Although I do not use much social media to contact or communicate with people, I feel connected with them at school but sometimes feel left out of online activities (Michael, age 16).

For example, a young woman in Grade 10 described her technology use in comparison to her peers:

Sometimes, it's hard to connect with others in person because they're so used to being on their phones. I can at least stay close with my closest friends because we can stay off our phones when we're around each other (Samantha, age 15).

There was an underlying sentiment from participants that they felt socially disconnected, which was exemplified by a young man in Grade 8:

Pretty well, I find that COVID has made it more difficult to connect with people on [town] when I live on [island]. But I pretty much never connect with my friends online, so COVID has made connections more difficult (James, age 12).

A subset of participants answered that they stay in touch during COVID-19 with friends via social media apps, texting, messaging, and FaceTime. Some participants did so 'as usual', and others felt the need to be online more to maintain and grow connections:

I feel like it didn't really affect me because most of my friends are online, so I could still talk to them. I have gotten contacts of people that I think I can be friends with (Joy, age 16).

In other words, many of these participants remarked that connecting with others online impacted the quality of their social connections. For example, a girl in Grade 9 shared she turned to technology to help form meaningful relationships in the time of COVID-19:

Since the beginning of Covid, I began to converse with people in my classes, but we were never close. I often relied on texting people rather than talking in person because we weren't always allowed to go outside because of Covid. As time passed, I talked more and used my social media accounts to converse with more people. I think I rely much on social media platforms to communicate with people. It's sometimes easier that way because of things like projects. Right now, I think that I get along with my friends really well. We talk as much in person and online. We always try to meet up in person whenever we can because we enjoy hanging outside of school when we have free time (Mikaeila, age 15).

With restrictions lifted, youth appeared to seek a balance between online and in-person connections, often feeling relieved that in-person activities were permissible. Technology was either 'used as always' or seen as a problematic necessity during COVID-19, with some youth sharing that the use of technology made building connections more problematic:

COVID-19 has lessened human socialization. I think it would be better to try and get people off their devices and engage in activities together. I'm not exactly sure how, though (Leilani, aged 13).

Participants expressed concern about their school connectedness. For instance, one young woman shared:

Ever since COVID-19, the quality of my school experience has decreased. This is due to not only classes and school systems, but the ability to connect with others within the past few years. I feel that I no longer want to make any more friends or get myself out there, as I am accustomed to being by myself at home with my devices. I don't feel a connection with others in my class like I used to. I mostly just want to leave as soon as possible (Leanna, age 15).

Processing Loss

Regardless of technology use, some students experienced a great sense of loss and even grief resulting from the many changes the restrictions imposed on their lives and felt they had regressed socially. Loneliness, depression, anxiety and despair were articulated through painful reflections:

[A]fter covid, I think my grades have been better, but other than academics, my life has been more boring. I feel like I lost my childhood after the pandemic (Melanie, age 13).

Some participants mentioned their friendships were impacted. One young man in Grade 8 explained:

I can't make any friends because I don't have the confidence nor the skills to be able to communicate to people I don't usually talk to since COVID-19 took a portion of my time which made it hard for me to be able to talk to others again besides my close friends I was already with (Eric, age 14).

Participants expressed that they felt socially disconnected. One young man in Grade 12 expressed:

Difficult. Pre- and during the pandemic, I didn't care about socializing at all. But after we came back, I realized how lonely I was. I didn't know what it was like to be loved or liked. I became scared of people. I started obsessively trying to learn how to be like a normal person and socialize, but even after so long, I still don't get it. I'm grateful for my current friends, but I'm scared after high school, they will be gone, and I am just not ready to say goodbye yet. What if I remain isolated for the rest of my life, like a lone star in the night sky of a city? It's scary and makes me anxious, sometimes even brings me to tears. And I feel like I'm just stupid or slow, and that somewhere back then, I'd fallen behind on my social skills and now I suffer the consequences. It's all just a mess for me (Martin, age 17).

Things are getting better now

Some youth were able to rise above the 'messiness' and use their emotional and social struggles during COVID-19 for personal growth most often resulting in increased self-awareness, independence and healthier relationships:

I had horrible COVID anxiety from 2020 and I'm still getting over that, but I really tried to grow into myself and make friendships during/after COVID. Although I did have some toxic friends and my mental health was bad for a period of time... (Ali, age 13)

Participants described feeling independent but still connected to their peers. A young man in Grade 9 explained:

I think due to COVID-19, I have grown to be more independent and connected with my fellow peers, and I connect with them both online and in person. (Aaron, age 15)

Similarly, participants described becoming more socially connected during the COVID-19 pandemic. A young person in Grade 11 explained:

Ironically, I think I've been getting along with people better after the lockdown, like my brain reset, almost. I feel like I was a bit socially inept before, but it's a better now (Devon, age 16)

During this turbulent time, participants experienced 'relationship pruning', which refers to the strengthening of ties with others during adversity and the loss of weaker connections. For instance, a young women described her peer connections as follows:

I was able to reconnect and rekindle the bonds that I have with my friends. They encourage me to go out of my comfort zone and push me to do things that would benefit me and my future. I was able to form stronger bonds than I would have if I wasn't separate from my

friends for such a long time (during the pandemic). It really made the friend group treasure each other more. (Maya, age 17)

Participants provided further elaboration and described how they felt during the COVID-19 pandemic. For example, a young woman in Grade 10 explained:

Since COVID-19 started, it was very hard to make friends. However, once school started again, I felt like I could connect with others more easily. The pandemic made me very depressed, but I found out I wasn't alone when I found my new friends. I feel that the new friends I made last year have a deeper connection with each other. We tried to talk about how we felt about each other, and everyone was very understanding. We also shared our experiences during the pandemic, which gave us a deeper connection. The people I talked to since this school year started, I feel, won't last. I mostly only talk to people if I have a class with them. Outside of whatever class it is, there isn't a level of initiative that both sides take to continue talking outside of school. (Jane, age 15).

School and peer connectedness within different ethnic groups

With the varied number and depth of responses attributable to ethnic group, exploration of themes across groups proved to be problematic. The themes described were recognizable in larger datasets, with certain response trends dominating the narrative. Among self-identified Indigenous students, the responses ranged in the extremes, with most students saying they were very connected and one student describing a tragic and traumatic account of being left alone in the night after suffering an injury. Among White respondents, more references to affective states were evident than within other groups and ranging widely with terms such as 'I'm happy' and 'I wanted to kill myself' appearing in the dataset. Biomedical understandings of psychopathology

were pervasive including disclosures of mental disorders (i.e. 'I have depression'; 'I have OCD and probably autism'). Latin American respondents had overwhelmingly positive and neutral appraisals of connectedness and mental health, more so than other groups. The greatest variability in responses appeared in the largest dataset, West Asian (n = 879). All the themes elucidated in the cross-ethnic analysis were present in the ethnic groups with the exception of Indigenous students (n = 7) suggesting again the COVID-19 situation resulted in highly personal experiences for young people and the role of culture in understanding and describing those experiences.

Discussion

We found that adolescent's sense of social connectedness was drastically influenced by the COVID-19 pandemic, however, our study findings suggest that most adolescents felt connected to others during the COVID-19 pandemic. Consistent with previous work (Gadassi Polack et al., 2021), adolescents in this study turned to technology to stay connected with others, although some social connections were strengthened while others were strained. In the following discussion, we consider the significance of social connectedness and technology use among adolescents during the COVID-19 pandemic.

The main finding of this work indicated that adolescents were relatively resilient in their response to being socially disconnected during the COVID-19 pandemic. Our findings support the literature on resilience, which states that resilience is a personal resource that can be acquired through transformational thinking and social support (Grafton et al., 2012; Rutter, 2012). For the case of the current study, through the judicious use of technology use and social connectedness. Research on resiliency and 'getting through tough times' repeatedly shows a link between successfully overcoming adversity and the role of social support and connectedness. For

example, a study conducted in Australia found that young people's coping strategies in the face of 'hard times' (e.g. natural catastrophes, work challenges) included seeking social support through friends, family and neighbours and secondly relying on emotional and cognitive approaches such as positive thinking and belief things will get better were the most common (Taylor et al., 2019). Youth in our study were overwhelmingly resilient, with more positive appraisals of their connectedness than negative ones, and a sizeable number even experienced growth from adversity resulting from restrictions on social life due to COVID-19.

Findings of this work show adolescents' ability to rise above COVID-19 social struggles and interpret the restrictions as threatening their wellbeing was centred around their comfort using technology. Being digital natives, technology-use have socialized youth into creating and maintaining social realities that transcend physical time and space, affording nearly constant access to each other virtually in addition to more sporadic and organized interactions in person. For connections to thrive in this online realm, however, as our study findings indicate adolescents must be at least willing to utilize this technology to keep up with peers. As a counterpoint, however, some youth in our study observed that relying too heavily on devices to keep social connections going was also problematic and resulted in being less able to socialize without devices in person. Youth appear to be aware that a balanced use of one's technology was required for social life, which was perceived as more beneficial than being without a mobile device and relying solely on in-person interactions.

Our study findings also showed support for the role of peers in providing a sense of connectedness and belonging. While the experience of COVID-19 restrictions varied considerably among youth, the role of peers and group norms surrounding technology-use affected participants connectedness and mental health. Our study findings suggest that youth

who can navigate peer group norms surrounding technology usage appear to benefit most positively from connectedness afforded by their peers.

Surprisingly, this study failed to show meaningful differences between technology usage and connectedness between ethnic groups. This finding may result from the number and ‘thinness’ of responses and potentially other artifacts of the survey design. However, the literature on the use of open-ended responses from survey data analyzed using reflexive thematic analysis shows that many ‘thin’ responses do create the richness in the data often seen in interviews (Braun & Clark, 2021) and in our study, the over 1600 thoughtful and often lengthy responses did spur conceptual and analytical units. As such, our findings on ethnicity may suggest that there are cultural adolescent norms to responding or thinking about peers and connectedness (Heine et al., 2010). That said, this democratizing effect of technology for racialized youth participation with peers and, thus, society is perhaps unique to the Canadian context as our findings appear to be contrary to overwhelming data from the United States shows that racialized youth are less engaged in digital spaces than non-racialized youth and experience worse mental health outcomes (Stewart et al., 2023; Everett, 2007). Further research should examine intersectionalities and technology use among racialized youth in a Canadian context.

Current research findings indicate that while most adolescents did perceive COVID-19 restrictions as a form of adversity, the psychological disorientation caused some youth to adjust to new expectations around social support, including connecting to others in new ways. Indeed, the perceived sense of loss and grief associated with the pandemic, was painfully processed but for some, resulted in personal growth and an even stronger impetus to become more social, whether that meant in the digital sphere or in-person. Many comments referred to ‘falling out of the practice’ of being social, but this changed as ‘things returned to normal.’

As mentioned earlier, some youth could still practice connectedness with peers in online spaces; some with ease and others reluctantly. Through repeated engagement with peers, some youth experienced a change in their peer group; some friends left, others joined, and the dynamic process of securing social support revolved around the use of technology and, to a lesser extent, pre-existing friendships. The limited in-person interactions and heightened developmental need to make connections resulted in more effort to evaluate one's participation in social groups. This changing peer dynamic also supports research on the effects of subjective well-being, affective well-being and cognitive well-being, where subjective well-being appears to depend on both affective and cognitive well-being (Luhmann et al., 2012). For varying life events (either deemed positive or negative), affective wellbeing is experienced sooner after an event than cognitive wellbeing, indicating a lag time during which individuals make sense of their affective states (Luhmann et al., 2012). This trend is corroborated in our study findings; youth first *felt* they were doing okay and *knew* that things would get better.

Limitations and future directions

Our study provides insight into the resiliency and connectedness promoted via technology among adolescents during the COVID-19 pandemic. However, several limitations should be acknowledged as well. A limitation of this research is that relative to interviews or focus groups (Braun et al., 2021) there is less depth to open-ended questions on a survey. Indeed, many of the responses were short and/or thin in terms of content. However, as noted above, most participants in this research provided valuable accounts of their experiences and perspectives. Moreover, qualitative survey data has been found to provide more focused, and 'on target' information than interview data (Braun et al., 2021). In addition, this research offered a high level of anonymity, which created a safe space for youth to give voice to a sensitive research

topic such as their lived experiences in the COVID-19 pandemic. Further, scholars indicate that samples over one hundred provide a rich dataset of appropriate scope to address research questions (Braun et al., 2021). By administering the survey to over 3000 participants, we were able to show that ‘thin’ survey responses can yield incredibly rich data yielding to conceptual analyses and were further able to elaborate on the complex relationship youths have with technology use, dealing with adversity and growing up into a social being.

Conclusion

In conclusion, the present study findings revealed that despite public health restrictions, adolescents remained fairly socially connected with others via technology use. Young people’s mental health was associated with their sense of social connectedness. Present study findings indicate that the global COVID-19 pandemic and public health restrictions may be linked to a unique event with a definite end (unlike the experience of bereavement, for example). The ‘definiteness’ of the event and the knowing things will be back to normal, eventually, appeared to have afforded youths much resilience and spurred them to adapt to the situation with the aid of technology use. The current research serves as a vital step in uncovering the intricate relationships among technology use, social connectedness and mental health, contributing to the ongoing conversations surrounding the well-being of diverse adolescents.

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