

The use of digital technology and its impacts on subjective wellbeing of adult populations

[1] Dr Sabitra Kaphle and [2] Alejandra Fernandez Torres

Affiliation: Central Queensland University, Melbourne, Australia

Appleton Institute

Centre > Health Equity in Regional and Remote Communities

Corresponding author: s.kaphle@cqu.edu.au

ORCID ID: orcid.org/0000-0003-2350-6568

Abstract

Subjective wellbeing (SWB) reflects to how individual experience and evaluate their life and often refers as self-reported measures of wellbeing. It has been recognised that increasing use of digital technology has impacts on the sense of wellbeing. This study was operated in the course of the lockdown caused by the COVID-19 pandemic which aimed to investigate the outcomes of the utilization of digital technologies on SWB among the adult populations residing in Metropolitan Melbourne areas of Victoria region in Australia.

This study used a mixed-methods approach for data collection which incorporated an online survey and Semi-structured in-depth interviews. Both survey and interviews focused on exploring the critical domains that included changes in use of digital technology and its relationship to life satisfaction, sense of social connection, and outcomes on mental health. The results of this research demonstrate a significant decline in SWB which was linked to hard restrictions for social movements during lockdown, increased level of stress, and changes in relationships.

While utilization of digital technologies has been beneficial to manage the work from home and social connections with families and friends, the significant increased in screen time didn't help to address the feelings of loneliness among adults. Overall, the results of this study suggest

a balance use of digital technology that helps to manage the wellbeing and social connections in the adverse life situations.

Keywords: *public health, pandemic, digital technologies, subjective wellbeing, adult populations, Australia*

Introduction

Subjective wellbeing (SWB) is based on the how people experience and evaluate their life with specific measures on the standard of life and well-being of the individual (Australian Institute of Health and Welfare, 2019). This construct of SWB goes beyond the traditional definition that refers health as a condition of physical, mental, and social health (Constitution of the World Health Organisation, 1946) and acknowledges the impacts of broader social, political, environment, and economic factors demonstrating association with a sense of self reported wellbeing (Boarini, Comola, Smith, Manchin, & De Keulenaer, 2012; Diener & Chan, 2011; Lawless & Lucas, 2011; Nikolova & Graham, 2021).

Several studies have established the interconnection between SWB and a person's wellbeing. For instance, Diener and Chan (2011) and Lawless and Lucas (2011) found that high quantity of SWB may increase an individual's life expectancy. Grant, Wardle, and Steptoe (2009) identified relationships between low SWB and behavioural probability components like smoking or acquiring low levels of physical movement. A meta-analysis conducted by Ngamaba, Panagioti, and Armitage (2017) focused on how SWB is involved in the health condition of an individual, and concluded that both hypotheses are muchly involved to one another. These researches concentrated on the life satisfaction aspect of SWB.

The utilization of digital technologies has escalated significantly in recent years, posing additional risks to SWB of populations (Madianou, 2020; Nimrod, 2018). Given the potential risks that increased digitalisation could pose to the health of populations, there is limited

evidence to understand the impacts of the utilization of digital technology use on the SWB of individuals or the consequences of increased reliance on the use of digital technologies on health and well-being (Chopik, 2016; Shah, Hess, & Goodkind, 2019). For many countries, digital technology has been the only option to abide the social distancing rules during the COVID-19 outbreaks (Madianou, 2020). In Australia, face-to-face social contacts were restricted to authorize the progress of the virus which resulted in higher reliance on digital interactions (Eedera, Kaphle, West, Lopez, & Cleary, 2022). Despite the fact that the OECD report (2019) locates Australia's preparedness for a serious move to a digital life, the forced use of technology to maintain everyday life with reduced natural social interactions could create risks to the SWB of the individuals. Studies that examined the impacts of the use of digital technology on SWB in the course of COVID-19 outbreaks highlight the further vulnerability (Chen et al., 2020) and the lower level of SWB among individuals (Möhring et al., 2021; Zacher & Rudolph, 2021).

Evidence links high SWB to increased life expectancy and low SWB to negative health behaviours (Diener & Chan, 2011; Grant et al., 2009; Lawless & Lucas, 2011). However, the proliferation of digital technologies introduces new variables, with both positive and negative implications for SWB (Madianou, 2020; Nimrod, 2018). The digital platforms became essential parts of life (Madianou, 2020; Eedera et al., 2022), but the impact of this shift on SWB remains underexplored, especially in the context of increased digital reliance (Chen et al., 2020; Möhring et al., 2021; Zacher & Rudolph, 2021). Using the results of the study conducted during the hard restrictions associated with COVID-19 pandemic in metropolitan Melbourne area, this paper reports the impacts of the use of digital technology on SWB among adult population.

Methods

Study design

This research employed a mixed-methods perspective (Shorten & Smith, 2017) that included an online survey which was designed in Qualtrics and semi-structured in-depth interviews (Legard, Keegan & Ward, 2003) which was conducted using preferred virtual methods. In the context of lockdowns that restricted personal social contact with participants, an online mixed method approach enabled researchers to gather meaningful data that based on lived experiences.

Recruitment of participants

Participants in this study involved adults aged 18 years and over, who were living in metropolitan Melbourne area during the time of data collection. We used purposive and snowball sampling approach to recruit the participants using personal, professional and social networks (Thomas, 2017). For snowballing, recruitment information was shared via email and LinkedIn asking contacts to share the information in their networks.

Data Collection

Online survey

We designed an online survey in Qualtrics adapting the domains based on the Life Satisfaction Scale (Diener et al., 1985), the New Zealand Treasury framework (2018), and OECD guidelines (2019), and we developed 35 questions. Those questions comprised both open ended and closed ended options and organised under the areas of demographics, life satisfaction, digital technology use, social connections, and digital safety.

In-depth interviews

We developed the online survey allowing respondents to express their interest to participate in interviews. Out of the 58 respondents who completed the survey, 12 expressed interest to participate in the in-depth interviews. During the follow up contact with 12 participants, only five participants confirmed their willingness to involve in the interviews. Using a semi-structured interview guide (DiCicco-Bloom & Crabtree, 2006; Thomas, 2017) that included

questions to pandemic experiences, digital social connections, work and financial satisfaction, sense of wellbeing, and digital safety, interviews were carried out via teleconference and held between 40–60 minutes.

Data Analysis

We exported survey data from Qualtrics to SPSS Statistics for Windows (Version 24) for the analysis of demographics and other SBW themes. These are presented in the results using tables, charts and graphs to demonstrate the associations of different factors on the level of SBW. We examined interview data applying thematic evaluation (Braun & Clarke, 2006) and identified the key themes that are included in this paper.

Ethical Approval

This research obtained approval from the Human Research Ethics Committee of Central Queensland University (Approval Number: 2020-091). Following the ethical guidelines, all participants involved in this study provided informed written consent for their involvement in survey and interviews.

Results

We incorporated the responses from 56 survey participants to draw results for this paper. When designed survey, we allowed options for respondents to skip questions, that demonstrates differences in reported results between the total number of responses and the results included. In terms of demographics, 28 survey respondents were within the age range of 30 to 40 years, two respondents reported between 60 and 80 years of age. In relation to the work, 38 participants reported working full-time, in which 21 participants were aged between 30 and 40 years. Out of 56 participants, 17 lived in a single-person household, while other 30 live in a shared house with families or friends.

Additionally, the biggest household sizes (4 to 7 people), constituting 25% (14) of the entire respondents, disclosed staying with family. Participants of the research were requested to indicate the sort of internet access available in their households. Total 59 participants reported

having internet access at home, while one participant only had access through a mobile connection. Out of the 55 respondents who answered this examination, 27% had altered their internet access at home during the lockdown to get better connectivity.

Quantitative Results

Life satisfaction

Three main interrogations were asked to calculate the entire life contentment of the respondents. Among 53 respondents, 60% reported an elevated level of life satisfaction (a score of seven or more). Additionally, six participants (11%) reported a life satisfaction score of five, with an average score of 6.5 for all respondents. The first interrogation utilised the happiness measure from the OECD (2019) SWB guideline. Participants were questioned, “taking all things together, how happy would you say you are?” They responded on a measure from 0 to 10, where zero denotes “not happy at all” and ten suggests “could not be happier”.

The second question was adapted from the Satisfaction with Life Scale (SWLS) to count both positive and negative affections (Diener et al., 1985; OECD, 2019). Participants selected from seven options on a measure (firmly agree, agree, vaguely agree, neither agree nor disagree, vaguely disagree, disagree, firmly disagree) for given statements. All statements were phrased to reflect positive affection. For the first four statements, more than 50% of participants reported agreement (strongly agree, agree, or slightly agree). These results reported here adds to the responses from the first question that demonstrates an elevated level of life contentment. However, an fascinating inspection was that more than 50% of participants disagreed with the statement, “If I could live my life over, I would change almost nothing”.

The third question consisted of multiple-choice items adapted from the New Zealand Life Satisfaction Framework (New Zealand Treasury, 2018) and the Victorian Happiness Report (Department of Health, 2015). Respondents were requested to reflect on the range of positive and negative emotions they felt the day before the survey. The results showed an equal balance and spread of positive and negative emotions, with 26% experiencing negative emotions, which is concerning.

Changes, accomplishments, and struggles

Within the life contentment portion of the survey, four interrogations aimed to grab the alterations that the survey participants had before and after the lockdown. The results captured positive and negative instances from the participants' perception of their lives.

Relationship changes

The first interrogation aimed on social connections and interrelations. The participants were queried if they had any alterations in their relationships. For those who reported changes in relationships were given the option to specify how and why these changes occurred. Out of 55 responses received, 35 reported no changes but nineteen reported changes in their relationships. The reasons for reported changes were - ending their relationship with partner, changes in friendships and changes in relationship with their children.

Routine changes

To capture the data on alterations in routine, participants were asked if their everyday life routine changed notably. Respondents who answered yes were given the option to explain the causes for this alteration. Significantly high numbers of respondents (48) confirmed the changes in their routine where 38 participants reported working from home being the main reason for change.

Accomplishments and struggles

Respondents of the research were required to mirror on their biggest achievements and hardships in the course of the lockdown durations and only 42 responses were received (Figure 1).

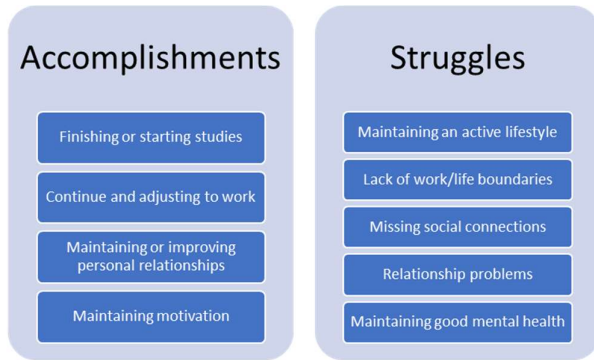


Figure 1: Accomplishments and struggles during lockdown.

Use of Digital Technologies

Frequency of use of digital devices

Two questions were asked to identify changes in the use of digital devices using scaled options for responses. The results showed that 40 and 50 respondents used the technology daily or every day before and after the COVID-19 pandemic respectively (Figure 2).

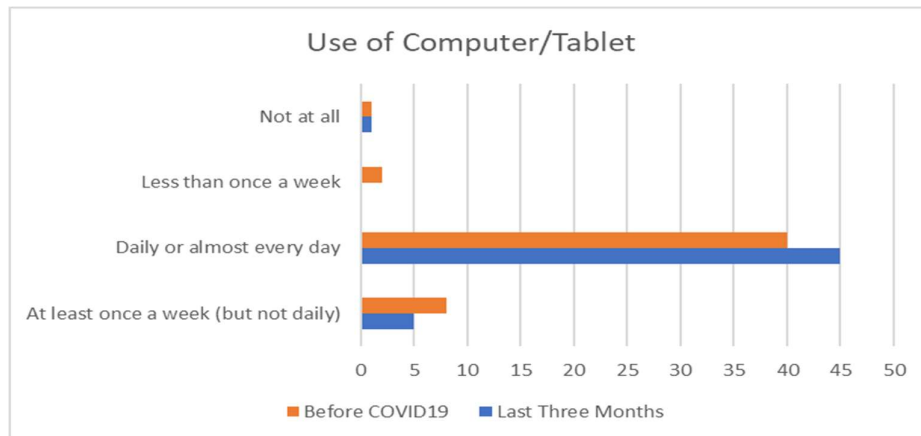


Figure 2: Use of digital devices before and after COVID-19

Usage of Internet since the start of the COVID19 pandemic.

To explore the patterns of internet use during COVID-19, a list of commonly performed internet activities was provided using the OECD Model Survey on ICT Access and Usage by Households and Individuals (2015) for respondents to select from, in which five most used activities were messaging, mobile phone usage, online shopping, social networking, and banking (Figure 3).

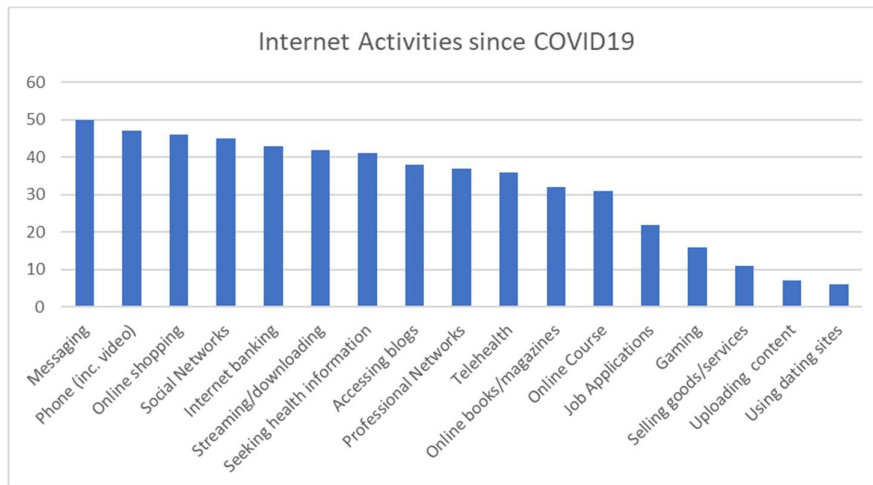


Figure 3: Uses of the Internet during COVID-19

Likelihood of using the technology

Table 1 shows that 30 respondents used the technology for job interviews, and 86% of them will continue to use the technology. Technology for remote work at home was used by 27 respondents, and 89% will continue to use the technology for the same purpose. Other reasons for using the technology for the first time and for continued use were reported by the respondents.

Online Activities	Did for the first time	Will like to continue doing	Percentage Will Like to Continue Doing
Worked remotely	27	24	88.89%
Did a job interview	30	26	86.67%
Movie Streaming Service	11	8	72.73%
Online Dating	7	5	71.43%
Remote learning	21	14	66.67%
Used a meditation app	12	8	66.67%
Physical Activity Programs	23	14	60.87%
Video chat to talk to family	23	14	60.87%
Open Social Network Account	2	1	50.00%
Had a telehealth consultation	22	10	45.45%
Online Shopping	14	5	35.71%
Other	3	0	0.00%

Table 1: First time activity using digital technology and likelihood of continuing the pattern.

Social Connection

According to the OECD protocol (2013), social connections are a significant variable that can influence personal evaluations of life contentment. Survey respondents were required to figure the regularity of contact they had with friends and family. This interrogation was tailored from the New Zealand Treasury's Living Standards Framework (2019). The scale utilized ranged from zero to ten, with zero indicating no contact at all and ten depicting excessive contact. The average regularity of contact with friends since the initial of the COVID-19 pandemic is 4.56, which is below the mid-range but not low enough to form issues. Conversely, the average regularity of contact with family was 5.82, a 1.6-point variation from contact with friends, but still not high enough to generate issues.

Frequency of loneliness

The loneliness question was adapted from the Life Satisfaction Scale from the New Zealand Treasury (2018). To measure the frequency of loneliness, the question included was, "Since March 2020, did you ever feel lonely?" where respondents were requested to answer on a scale from zero (all the time) to ten (never). Out of 50 recorded responses, 22 participants reported low frequency of loneliness compared to 19 who reported the higher frequency of loneliness. Additional six participants reported in the middle of the scale and three participants stated that they never felt lonely.

Digital safety

We assessed the perceptions of safety among the participants when engaging in various online activities such as online transactions and sharing personal information. We used three-point scale to measure how safe or unsafe respondents felt while doing online transactions. Most respondents (76%) reported feeling safe, while 8% felt unsafe while making online transactions. Taking the pandemic into the account, we compared whether the perceptions of safety among participants changed and we found no significant changes reported. While 18% participants indicated the changes in their perception of safety, we did not capture whether these changes were positive or negative.

Strategies used to keep online information safe

We measured how participants were keeping their information safe while performing online activities. For this measure, we provided a list of commonly used strategies to choose from, with an option to indicate strategies participant used for safety. In response, 40% reported

that their strategy was to avoid using applications that made them feel unsafe, while 22% didn't use any strategy for information safety (Figure 4).

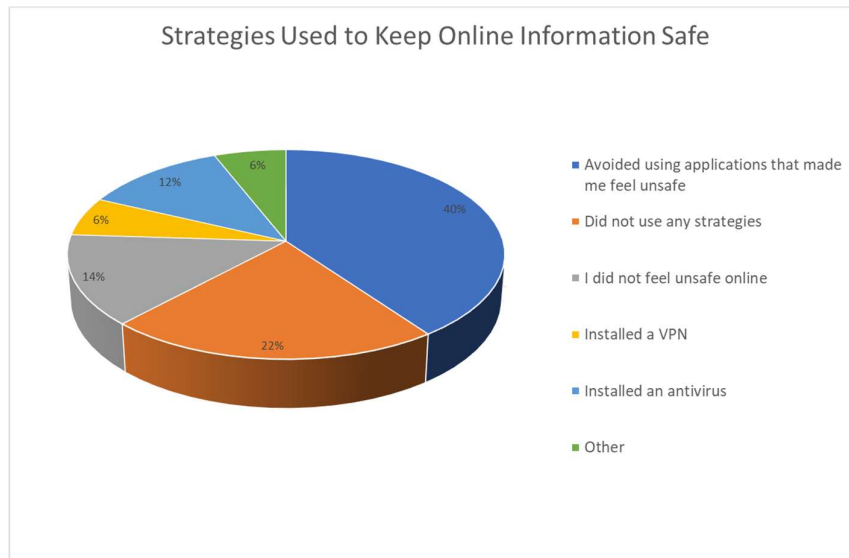


Figure 4: Strategies used to keep online information safe.

Qualitative Results

In this paper, we report the results from five semi-structured interviews to provide additional insights about the experiences of participants around the use of digital technology and the impacts on SWB. This section includes the key themes identified through the thematic analysis process.

Going Virtual: Digital Shift in Life

Participants reflected on the significant shift to a virtual way of living and working. This theme captures how the transition to digital platforms has impacted various aspects of their daily lives. Participants noted that the COVID-19 accelerated their reliance on virtual tools for both personal and professional activities. This transition has resulted both positive and negatives experiences.

On the positive side, participants appreciated the convenience and flexibility that digital engagement that allowed connections with family and friends, enabled attending virtual events, and managing work tasks from the comfort of their homes. However, some participants expressed challenges including digital fatigue, difficulties in maintaining work-life balance with the concerns around online security.

Changing living arrangements

Accommodating and rearranging their living space to manage activities during the lockdown became a challenge for most as they did not have a proper space to set up a home office, when living in a one-bedroom apartment and for those with young children.

One participant commented:

“We have a two-year-old at home who could not go out to do any of his normal activities, and that was hard. Our child was bored and anxious and you know, a lockdown with a two-year-old in a confined space. Just imagine!”

Managing small spaces to manage work from home has been challenging.

Another participant added:

“I have a one-bedroom apartment. I was staying there, but soon I realized that I could not live and work in that confined space during the lockdown. So, I came to live with my family, as they have more space in the house, a nice garden, and a park nearby. Though I miss having my personal space, this will get me through for a while.”

Keeping the balance

Maintaining their work-life balance was challenging for most participants as they had to work odd hours to get the job done while accommodating other priorities.

One participant commented:

“The good thing with my work is that when I finish for the day, my day is complete; there is no more going back. I am able to work this way because I do not have multiple projects that require additional hours these days. I used to do extra hours of work, but thankfully, not anymore.”

Additionally, participants found the digital way of living life a hard juggle.

Another participant added:

“I didn’t realize that I have the option to not engage with technology outside of work hours. I just use my phone and laptop all day long without thinking, flicking from one platform or website to another. Even though, at some point, I feel down, I didn’t realize I should or could drop the screen and do something else.”

Staying connected

Changes in connecting with friends and family during the lockdown has been another factor that influenced life for these adults. For many participants, connecting digitally was not the preferred choice due to their long hours of work involving video calls.

One participant mentioned:

“I lack social contact with people, and being connected on devices all day for work throughout the week has been exhausting. So, the last thing I wanted to do on the weekend was to go back on the computer and do video calls. I did not want to do that; rather, I preferred to stay with no contact.”

Seeking health services

Digitalisation has affected the way participants’ access to health care services.

One participant mentioned:

“I felt happy that I could still contact my GP and get advice for my health problems. I needed a referral to a specialist, and my GP was able to do that over the phone. That really helped, and I found it easy to get things done that way.”

When not all services were available digitally, participants shared the frustration of constant appointment cancellations.

“We had multiple telehealth appointments during the COVID outbreak, but we were not able to access services like immunization, dental, or specialist clinics. The government stopped all medical treatments suddenly, and my routine skin checks at the clinic could no longer be done. Things were not the same as we used to manage our appointments and healthcare.”

Lockdown further impacted access to specialised care.

“I had to see a therapist; my GP referred me. Oh, it was highly frustrating. Everybody wanted to see a therapist, so it was extremely hard to get an appointment. Once I was able to get an appointment, they cancelled three times. I felt like not trying anymore. I did not like this telehealth system. It felt extreme, and I could see myself crying. I felt helpless.”

Changes to Affective States: Sense of Wellbeing

Participants spoke about their experiences of feeling difficulties during the lockdown, highlighting significant changes in their affective states and overall sense of wellbeing. The rapid and unpredictable changes coming into the effect made navigating daily life particularly challenging. Many reported heightened levels of emotional strain and anxiety due to the

uncertainties associated with the pandemic that led to the feelings of isolation and loneliness. Despite these challenges, participants also demonstrated resilience and adaptability by finding new ways to cope with their emotions.

Loneliness

Loneliness is closely associated to the SWB of individuals and participants shared how their feelings of loneliness increased during the lockdown.

One participant commented:

“For me, finding myself in a state of loneliness was the biggest challenge during lockdown. I felt lonely, helpless, and anxious. I knew I needed to talk to people, share my feelings, and feel supported. I tried hard to escape the feeling of loneliness.”

Participants further explained the impacts of loneliness:

“Loneliness impacts us personally and socially. My housemate was alone for around seven or eight months during that long lockdown. I could see that it was extremely hard for her. She talked about being isolated and disconnected from usual life patterns, which added to her struggle with loneliness.”

Changes in lifestyle

The lockdown created the shift to the homebound life that led to the changes in lifestyles with some developing positive experiences while others struggled to maintain their healthy routines.

One participant spoke about taking unhealthy actions:

“I think my health in general deteriorated because, you know, I was eating a lot, I wasn't exercising as much, and, you know, like I said, all the gyms were closed, so we didn't have ways to exercise. It was just what you could do in the house and then

go for a walk or try to eat as healthy as possible, but that never really happened. When you are watching TV more than usual, you end up eating junk food, so I did lose a bit of will... and then definitely gave in to the alcohol and the junk food.”

In contrast, another participant was able to adapt to a healthy routine:

“There is a huge 100-acre park near my home, and I had previously walked there irregularly, but during the pandemic, it was the most I had ever seen other people in the community using the park. Sadly, even though I have continued walking there because I love it so much, the crowds have dropped. Sometimes, no one is there.”

Changes to affective states (difficulties)

In terms of varying encounters stated by the respondents, changes to their affective states and overall satisfaction were identified.

For example, one participant commented on the impact of financial satisfaction:

“We rent out the house that we own, and the tenants left just before the second lockdown, which meant we could not find people to move in quickly. As they could not look at the houses [house inspection], no one showed interest in renting it. It remained vacant for a couple of months; we lost our income. So yes, it got a bit tight during that time.”

On top of financial struggles, the uncertainties created by the pandemic further impacted the wellbeing.

Another participant commented:

“I had mixed feelings along the way. At the start, there was just so much uncertainty about what was happening, and I was just sort of interpreting stuff. I wasn’t really listening to much of the noise other than the directives that were coming through. I

think as that progressed and people became clearer about what was happening and the stories that started to come out, I got mixed feelings, either subconsciously or consciously. I just accepted the circumstances.”

These narratives reveal changes in life satisfaction among the participants involved in the study with significant challenges emerged in maintaining wellbeing and social connections during the lockdown. Although digital platforms offered convenience and adaptability, they were insufficient to fully mitigate the psychological and social impacts of prolonged isolation. These results demonstrate the need for targeted strategies that promote balanced digital engagement, strengthen mental health support systems, and foster social connections to enhance resilience for populations going through the unpredicted situations.

Discussion

The life satisfaction scale impacts of our study indicate a significant decline in SWB of the sample adult population in Melbourne, Australia compared to the SWB reported in the Victorian Happiness Report (Department of Health 2015). Results of in-depth interview data revealed that the low SWB in our research was due to the result of the pandemic that led to the changes in their everyday movement and communication. Available evidence further supports this finding due to the impacts experienced by the adult population during COVID-19. For example, a recent study conducted among adults of the Melbourne metropolitan area reported high level psychological impacts during the pandemic with significant increase in work and family related stress (Eedera et al., 2022). Such impacts are extremely concerning to maintain optimism and wellbeing in our participants.

Our study found that everyday lifestyle routines changed dramatically because of mandatory stay home orders. Bareket-Bojmel, Shahar, and Margalit (2021) reported consistent critical

factors - health, economic, daily routine change, and social isolation contributing to the high level of anxiety. In our study, it is important to note that the struggle in maintaining social connections, relationship and mental health is crucial in terms of managing life matters.

Social connection is an essential element of life satisfaction and overall wellbeing. Since the start of COVID-19 outbreak, our study found that the frequency of contact with friends stayed the same but the contact with families increased slightly. While we didn't find any inequalities in the utilization of digital technology in the course of pandemic, Nguyen, Hargittai, and Marler (2021) reported that those with greater socio-economic and digital privilege were plausibly to maintain communication with family and friends – adding further vulnerabilities to the disadvantaged group of populations. Our study did not examine the correlation between socio-economic status with frequency of social interactions, so we are unable to explain if similar differences exist among the adult populations.

State of loneliness is linked with the experience of depression (Krendl & Perry, 2021). In our study, 50% reported high frequency of loneliness and we can assume that loneliness might have prompted more frequent contact with families for emotional support. Our study confirms that there has been significant increase in screen time and utilization of digital devices in the course of the COVID-19 pandemic. The highest use of digital devices was by all participants linked to working remotely due to the stay home orders during the lockdown. Perception of risks to engage in online environments for purchasing essential items during the COVID-19 has been debatable (Leung & Cai, 2021), as for some online options were more convenient than going to the shop. However, our participants did not express that being a concern and were comfortable sharing personal information in online spaces with no specific data protection strategies. As a common phenomenon, if anyone felt unsafe using a specific site, they avoided going to that site again to stay safe.

The results showed that the utilization of digital technologies poses both risks and opportunities to the levels of SWB of the sample adult population. In general, the sample population of Melbourne was able to adapt well to the differences in lifestyle. However, it is important to keep in mind that the risks associated with the overuse of digital technologies needs attention and more comprehensive studies in this area will help to understand the extent of impacts on SWB of adults living in the course of a pandemic.

Conclusion

Throughout the COVID-19 pandemic, this study revealed a significant decrease in SWB among adult population due to the hard restrictions on social and physical movements. The associated restrictions on movement had impact on everyday life and led to the increased sense of loneliness and social isolation. Further impacts include heightened anxiety with difficulties in maintaining social connections that are critical for wellbeing. While use of digital technology facilitated communication and connections with families and friends, it did not fully mitigate the associated risks for SWB during the lockdown. An informed and balance approach for the use of digital technology is therefore recommended to address the challenges associated with social isolation and concerns around safety.

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