Discussion paper:
Digital technologies and youth mental health

Contents

1. The current youth mental health and wellbeing landscape

The purpose of this paper

This paper intends to serve as a discussion starter. The National Mental Health Commission (the Commission) wants to deepen the conversation around digital technologies and mental health so that we can better understand what components of technology are helpful or harmful. Where digital technologies simultaneously present opportunities and challenges, we hope to develop recommendations that maximise potential benefits and minimise potential harms for young people.

We want to hear about your experiences with digital technologies and how they have impacted your mental health. We'd especially like to hear from young people, parents, educators, and experts in youth mental health and digital technologies. While we note there are many positives to digital technology, this paper deliberately explores the issues young people are experiencing so that we can develop solutions and provide robust policy advice to Government and the mental health and suicide prevention sectors. We will deliver this advice in a publicly released report in September 2023.

We invite you to **share your views via the survey** available through the Commission's *Have Your Say* platform, which you can find here.

The short survey asks you to:
- **Share your reactions** to the ideas we put forward throughout this paper on how digital technologies help or hinder young people's mental health and wellbeing.
- **Consider what should be done** about the potential mental health and wellbeing impacts we have highlighted.

When the Commission uses the term digital technology, we are referring to the electronic tools, systems, devices, and resources that generate, store, share or process data.[1] Digital technologies includes digital environments, services, and platforms – these are online spaces that may allow access to and uploading, distributing, and sharing of content, such as social media services and gaming platforms.[2] Social media refers to any online social network, which is a website or app that allows a user to create and share content online (e.g., TikTok, Instagram).[3]

Research into the ways young people engage with digital technologies and the positive or negative impacts this can have is still in early stages. As technology constantly evolves, research in this area can become quickly outdated. As a result, the ideas we put forward in this paper should be thought of as hypotheses, drawing conclusions based on currently available evidence. This is to help spark new ideas that support young people as well as possible and as early as possible. Where there is only early evidence available to support a concept, this is highlighted in the paper.

We recognise that this paper cannot speak to the diverse experiences of all young people in Australia, and there may be further evidence we have not fully captured. We welcome you to share additional research with us alongside any other insights you might have, and we will seek to incorporate this into our thinking moving forward.

Background

The Commission provides cross-sectoral leadership on policy, programs, services and systems that support better mental health and social and emotional wellbeing in Australia. There are three main strands to our work: monitoring and reporting on Australia's mental health and suicide prevention

systems; providing independent advice to government and the community; and acting as a catalyst for change.

In 2021, the Commission began exploring the decline in young people's mental health over recent decades, focusing on those aged 13-25 years. Over the last fifteen years, a number of indicators of psychological distress have been increasing at a higher rate for this age group compared to others in Australia. Indicators include measures of self-reported distress,[4] self-harm hospitalisations,[5] rates of anti-depressant use and Medicare Benefits Schedule (MBS) mental health service usage,[6] together with service providers saying that young people have been presenting to services with increasingly complex problems.

To investigate why this was occurring, we undertook desktop research as well as consultation with a Youth Advisory Group convened through headspace National, alongside a Technical Advisory Group comprised of experts in children and young people's mental health. This process highlighted six highly complex and interrelated drivers of increased distress, each reflective of significant cultural changes to the world in which young people live. Figure 1 below provides an overview of some of the documented changes that may be contributing to increased distress.
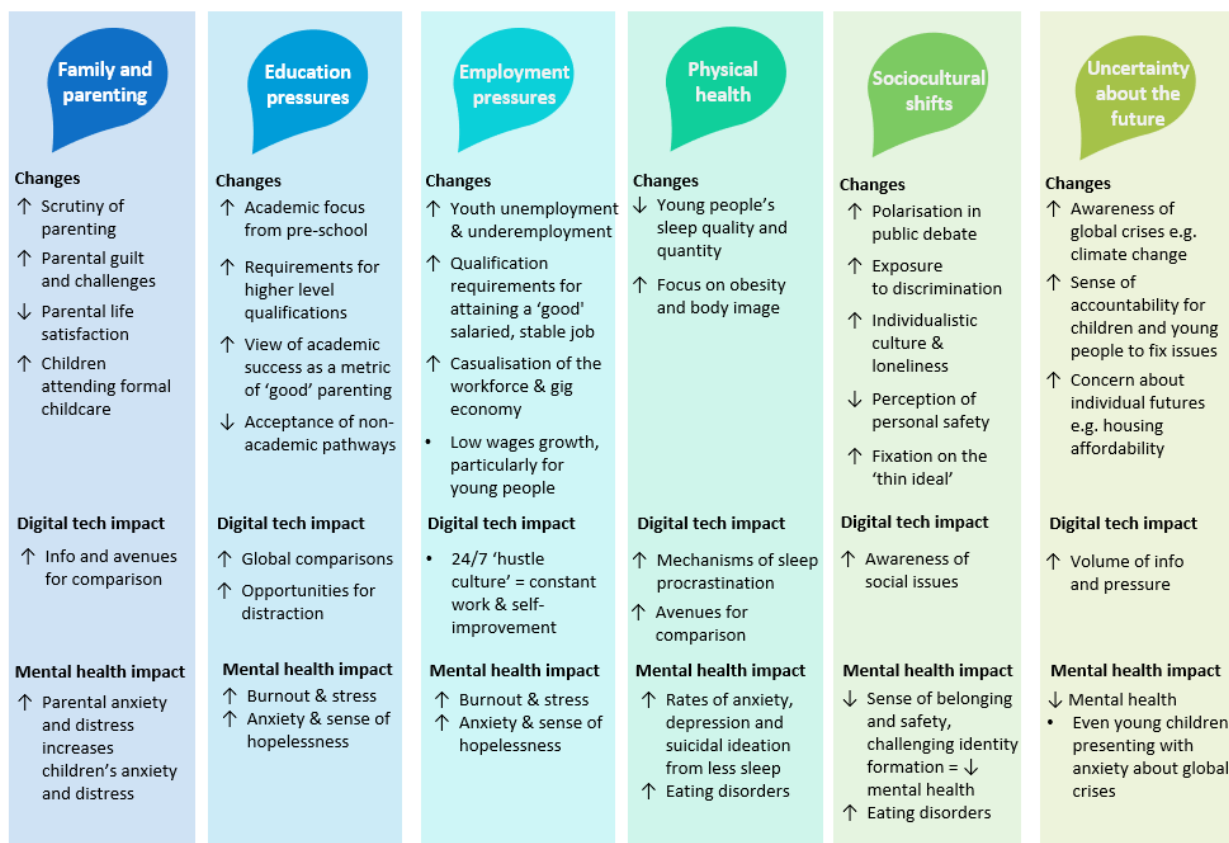
Family and parenting	Education pressures	Employment pressures	Physical health	Sociocultural shifts	Uncertainty about the future
Changes	**Changes**	**Changes**	**Changes**	**Changes**	**Changes**
↑ Scrutiny of parenting	↑ Academic focus from pre-school	↑ Youth unemployment & underemployment	↓ Young people's sleep quality and quantity	↑ Polarisation in public debate	↑ Awareness of global crises e.g. climate change
↑ Parental guilt and challenges	↑ Requirements for higher level qualifications	↑ Qualification requirements for attaining a 'good' salaried, stable job	↑ Focus on obesity and body image	↑ Exposure to discrimination	↑ Sense of accountability for children and young people to fix issues
↓ Parental life satisfaction	↑ View of academic success as a metric of 'good' parenting	↑ Casualisation of the workforce & gig economy		↑ Individualistic culture & loneliness	↑ Concern about individual futures e.g. housing affordability
↑ Children attending formal childcare	↓ Acceptance of non-academic pathways	• Low wages growth, particularly for young people		↓ Perception of personal safety	
				↑ Fixation on the 'thin ideal'	
Digital tech impact	**Digital tech impact**	**Digital tech impact**	**Digital tech impact**	**Digital tech impact**	**Digital tech impact**
↑ Info and avenues for comparison	↑ Global comparisons	• 24/7 'hustle culture' = constant work & self-improvement	↑ Mechanisms of sleep procrastination	↑ Awareness of social issues	↑ Volume of info and pressure
	↑ Opportunities for distraction		↑ Avenues for comparison		
Mental health impact	**Mental health impact**	**Mental health impact**	**Mental health impact**	**Mental health impact**	**Mental health impact**
↑ Parental anxiety and distress increases children's anxiety and distress	↑ Burnout & stress	↑ Burnout & stress	↑ Rates of anxiety, depression and suicidal ideation from less sleep	↓ Sense of belonging and safety, challenging identity formation = ↓ mental health	↓ Mental health
	↑ Anxiety & sense of hopelessness	↑ Anxiety & sense of hopelessness	↑ Eating disorders	↑ Eating disorders	• Even young children presenting with anxiety about global crises

Figure 1. Overview of possible drivers of increased mental ill-health across six domains

A focus on digital technologies and youth mental health

Our deep dive led us to conclude that one of the most dynamic, impactful and unexplored facets of young people's developmental experience relates to the significant expansion of digital technology. We know this is just one of many components affecting youth mental health, but it is one we are seeking to understand more deeply. More than simply a mechanism or tool for doing things, digital technologies are an intrinsic part of the environment in which we all now live, learn, relate, and grow,[7] with schools, workplaces, and communities all increasingly reliant on digital technology to

function. Given the significant expansion of digital technologies into all areas of our lives, the Commission is exploring how digital technologies are impacting young people's mental health and wellbeing.

We acknowledge that social media is only one element of our increasingly digitised world, and a small component of what young people engage with on a regular basis. Schools, workplaces, community spaces, and even our homes are increasingly digitally connected. While it is often suggested that social media is the main cause of the decline in youth mental health, we believe it is important to explore the impact of digital technologies more broadly.

Many people are concerned about the impacts of digital technologies on young people, including young people themselves.[8] Young people have been subject to significant scrutiny about their use of digital technology, and in response, there has been considerable work done to support young people to be safe online (see the work of the eSafety Commissioner). However, the responsibility does not sit with users of digital technology alone – some apps and platforms are designed specifically to limit our ability to self-regulate our usage, particularly when we are unaware of how we are being influenced.[9]

A wide range of factors are thought to affect whether digital technology use has a positive, neutral, or negative impact on mental health – for example, the type of technology used, the nature of that usage, the frequency of use, as well as individual characteristics such as personality and gender identity. While the evidence base is rapidly emerging, large scale, longitudinal studies are limited on this topic[10,11] making it difficult to draw conclusions around causation. Further research into all areas of digital technologies will be critical in continuing to strengthen our understanding of these emerging issues. However, based on the available evidence, we theorise that the harmful elements of digital technologies discussed in this paper are one component contributing to increased mental ill-health of young people.

Public discourse often focuses its concern about two factors – excessive use and harmful content. This typically leads to calls for use of digital technologies to be restricted or reduced. Restrictive approaches tend to be ineffective at reducing harm as they do not inform young people on what components of the digitised world may be harmful, nor do they empower young people to utilise techniques for reducing safety risks. Attempts to quantify what constitutes 'excessive' or 'too much' use have been challenging, given this is often dependent on the type of use as well as the context of the individual – what is 'too much' for one person could be completely different for another.[12]

It is important to consider the positive potential of digital technologies, [7,13,14,15] as well as the rights and agency of young people, when exploring their impact on mental health and wellbeing. For example, social media is a powerful tool for connection and has been particularly critical in keeping young people informed and connected throughout the COVID-19 pandemic.[9] Young people are also adept at building their own digital skills and put in significant efforts to manage online risks.[16]

When approaching this issue, we should acknowledge that it is not just young people who are reliant on these technologies in everyday life – many adults are likely to also experience negative impacts of digital technologies, and so restriction approaches targeting young people may prove misguided. We should also be mindful of the varying levels of connectivity across groups and consider how policy approaches are ensuring fair and equitable access to the digital technologies that are required for success in today's everyday life.

Available data confirms that Australian children and young people are high users of digital technologies. An estimated 97% of households with children aged under 15 years are connected to the internet.[17] Time spent online tends to involve researching topics of interest, listening to music, watching videos, movies or TV, chatting with friends and gaming online.[18] Teenagers use an average of four different social media services, and 12-year olds report using these services despite age limits for most services being 13 years.[18] Despite Australia's high levels of connectivity, there are some groups who are less likely to be digitally included – this is sometimes referred to as the 'digital divide'. Levels of digital inclusion increase with education, employment, and income.[19]

2. Exploring the impacts of digital technology on youth mental health

Based on the available peer-reviewed literature, grey literature, and input from our consultation with experts and young people, we have mapped out the various ways digital technologies negatively impact young people's mental health and wellbeing. These have then been broadly themed into three domains (see *Figure 2* below) and explored further in the following section. This discussion paper largely focuses on the negative impacts to assist us to understand the nature of the problem. Throughout each section, the positive impacts are also noted, and these will be a key consideration when the Commission is developing policy advice.
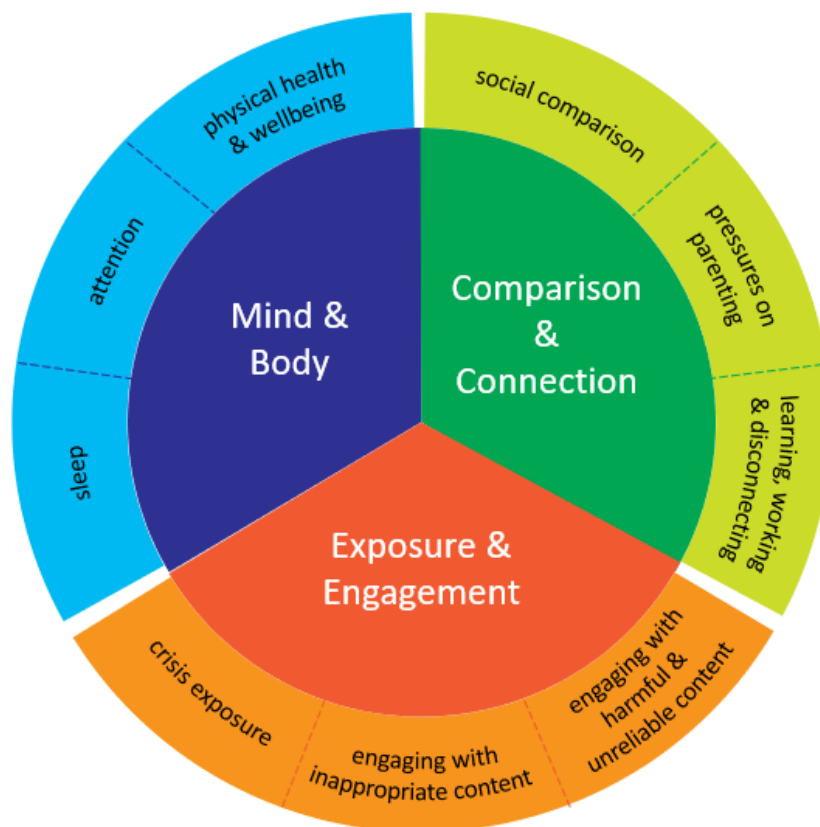

Figure 2. Overview of domains

Mind and body

This domain discusses how digital technologies are impacting sleep, attention, and physical health and wellbeing.

Sleep

Poor sleep has been linked to poorer physical and mental health outcomes – it is a risk factor for development of mental health conditions such as depression and is associated with heightened risk of suicidal ideation.[20,21] For young people, sleep disturbance can affect the ability to regulate emotions and increase the risk of anxiety, low self-esteem, disturbed mood and fatigue. The relationship between sleep and mental health is bi-directional, in that sleep is both a symptom of, and a contributing factor for, mental ill-health.[22]

Those aged 14-17 years in Australia are often not obtaining the recommended hours of sleep during the school week, while 18-24 year olds are on average obtaining the lower end of the recommended sleep length.[1,20] Through the 2021 Australia Talks National Survey, 89% of respondents agreed that technology was having a negative effect on their sleep. This sentiment was strongest among young people, with 94% of 18-29 year olds endorsing the negative association.[23] It is common for young people to use digital technology directly before bed, and this has been found to lead to later sleep onset and less overall sleep.[20] Young people have noted that they sometimes engage in prolonged evening digital technology use as part of relaxation given this is often the only time in which they do not have other responsibilities such as school, work or domestic duties (sometimes referred to as 'revenge bedtime procrastination').[24] It is also common for young people to use digital technology to help them fall asleep.[25] Evidence suggests using meditation and mindfulness apps[26,27,28] or white noise[29] to assist falling asleep appears to improve sleep outcomes. In contrast, the use of television, computer games and music to fall asleep are less beneficial for young people's sleep length and quality.[25]

A meta-analysis found that children and adolescents who used a portable screen-based media device (including smartphones and tablet devices with internet and social networking capabilities) at least three times per week had inadequate sleep duration and poor sleep quality compared to those who did not have access to a portable screen.[30] Similarly, a number of systematic studies have noted an association between engagement with digital media, including social media, gaming and internet use, (particularly high rates of use and use before bedtime) and poor sleep quality for young people.[31,32,33,34] Sleep quality generally refers to the satisfaction of the sleep experience, including in relation to the time it takes to fall asleep, sleep disruption/awakening, and feeling refreshed when waking.[35,36] Restricting mobile phone use in the hour before a young person's bed time has been shown to assist earlier sleep and increase total sleep time.[37] Research also indicates active screen time has a greater impact on young people's sleep than passive screen time.[38] Active screen time includes engaging in activities that facilitate direct exchanges with others, like video gaming and posting, commenting and liking other posts. Passive screen time refers to the consumption of information without direct exchanges, for example scrolling app 'newsfeeds'.[39]

It has been well established that young people tend to stay up later due to biological delays in sleep onset during adolescence,[40] nonetheless the amount of sleep young people are getting has been declining since the late 1990s.[41] Digital technologies provide a convenient and engaging mechanism

---

[1] 8-10 hours of sleep per night is recommended for 14-17 year olds, with the average amount of sleep during the school week for this age group varying between 6.5-7.5 hours. For 18-24 year olds, the average weeknight sleep is estimated to be 7 hours 14 minutes, with the recommended sleep length for this age group being 7-9 hours.

by which to stay up late, which are likely exacerbating existing tendencies for later sleep onset in adolescence.

Hypothesis 1: Digital technology use, particularly before bedtime, is negatively impacting young people's mental health and wellbeing by reducing overall amount of sleep and the quality of that sleep.

Attention

There is considerable speculation about how digital technologies may be impacting our cognitive abilities. Research is still evolving in this field, with gaps particularly in longitudinal studies that would demonstrate lasting impacts.[42] Attention is one aspect of cognition critical to our learning and functioning[43] that is thought to be impacted by digital technology. On a fundamental level, attention refers to the capacity to process targeted information while tuning out other details. The nature of this impact on attention is debated however, likely due to the number of variables that play a role (such as individual characteristics and type of tasks tested). Research that links impacts on attention to mental health and wellbeing, is particularly new.

Nonetheless, it is evident that digital technologies can attract and retain attention, not just due to the content they present, but also because of how the digitised world is designed.[44] Current research proposes that characteristics of digital technologies encourage us to engage with a wide range of information and to be readily distracted. For example, the 'attraction mechanism' is where algorithms propel a self-reinforcing reel of appealing content to the forefront of digital platforms, where the more you interact, the more content is tailored to you.[44] 'Checking behaviours' involve quick frequent use of devices to get a gauge on new information from news and social media, reinforcing us with quick rewards that draw us away from other tasks.[44] This can include at times when we aren't directly engaged with a device. For example, when hearing an alert or seeing a notification pop up on your phone.[42,45,46] Just noticing someone else using their mobile device or being reminded of an activity that can be completed on one's mobile phone (email, information search etc.) can also trigger subsequent mobile phone use.[46] These behaviours are examples of ways in which digital technology is designed to demand a shift in our attention, ultimately bleeding into many aspects of our lives.

Frequent shifting of attention is referred to as 'media multi-tasking' and has implications for our ability to sustain attention. Some research has demonstrated that 'heavy' media multi-taskers had greater vulnerability to being distracted by irrelevant information in their environment and in their own memory,[47] however this finding has not been consistently replicated.[48]

These impacts on attention present particular challenges for learning environments. Despite the benefits digital technologies are thought to have brought to young people's education[49,50] (see section on '*Learning, working, and disconnecting*'), there are also concerns that these technologies impact students' ability to focus and learn effectively. Educators surveyed for the Gonski report found that 84% believed that digital technologies were a growing distraction in the learning environment and 78% believed that students' ability to focus at school had decreased.[51] Parents are also noticing the effects of digital technologies with over 90% of Australian parents feeling that they themselves are negatively distracted, at least to some extent, by digital technologies. Three in four believe that this distraction is growing.[52]

Activities that feel meaningful to us, or are known to foster a sense of self, purpose and wellbeing[53] often require sustained attention or the maintenance of goal-directed activity. For example, things like finishing a project you've worked really hard on, building relationships with loved ones, solving a

school or work problem, or a creative hobby. However, when we experience frequent distractions or interruptions, often facilitated by the design of digital technologies, we are less likely to be able to sustain our attention on those meaningful activities that require longer periods of focus or deep thought. Some studies have begun to demonstrate that this has an indirect impact on young people's mental health and wellbeing – media multi-tasking was found to reduce engagement with academic and social activities as well as impacting sleep length and onset (as discussed above).[54]

Given some digital technologies have been found to be a pervasive source of distraction and interruption[46] which therefore reduce our ability to focus on other important aspects of life,[44] we theorise this is ultimately affecting mental health and wellbeing. Young people may be experiencing a reduced ability to engage in activities that foster a sense of self, mastery, meaning and purpose, aspects that are critical for good mental health and wellbeing. While this impacts everyone, young people are exposed to this from a younger age, during key developmental periods and at a time critical to the formation of identity (a foundational developmental component of maturing into an adult).[55] While some forms of digital technologies can promote achievement and mastery (e.g. a qualitative study found online game play could lead to benefits for players including offering a sense of meaning, personal growth and skill development)[56] – we theorise that the way in which young people are engaging with some forms of technologies, and the ways in which these technologies are designed, are not consistently promoting these critical components of wellbeing.

Hypothesis 2: Digital technologies that are designed to capture and hold attention (such as social media and other mobile apps) are negatively impacting young people's mental health and wellbeing by making it harder to pay attention to other meaningful activities that encourage a sense of self, purpose and meaning.

Physical health and wellbeing

Time spent on digital technology is thought to be increasing, with research from the USA indicating that the share of teenagers aged 13-17 years who say they use the internet almost constantly has increased from 24% in 2014-15 to 46% in 2022.[57] If time spent online is increasing, it is reasonable to infer a corresponding decrease in time spent on other activities, including components beneficial to mental health. This concept, referred to as the 'crowding out' hypothesis, has been proposed as a plausible explanation of a causal relationship between internet usage and reduced wellbeing outcomes.[58] In support of the 'crowding out' hypothesis, an increase in sedentary lifestyles has been associated with technology use, amongst other factors (such as television viewing, office work and limited available spaces for exercise).[59] Sedentary behaviour refers to being physically inactive, either sitting or lying down for long periods, excluding when sleeping.[60] Parents are concerned about the health impacts of excessive digital technology use, including negative impacts on their child's physical activity levels, attention span and time spent doing other activities such as being creative, playing and spending time with friends and family.[52,61] These activities are known to be protective factors for mental health and wellbeing.[62,63,64] Thus young people's mental health and wellbeing is likely to be impacted by lower levels of engagement with these activities.

There have been suggestions that the use of digital technology is associated with a variety of health risks, such as developmental problems, physical inactivity, and obesity among preschool and school age children.[65] However, experimental studies that reduced screen time revealed only a small increase in physical activity among participants, while other studies found positive physical health behaviours stemming from interventions that use social media to encourage physical activity.[66,67] There are more extreme examples of impacts on physical health where digital technologies are used in excess. One study examined the consequences of excessive computer game use for young people

who self-identified as addicted to computer games and found heightened risk of obesity, back and neck pain, orthopaedic and joint problems, eyesight and hearing problems.[68]

There is growing speculation around the relationship between increased time spent on screens and a decrease in time spent outdoors or in nature.[69] An Australian study investigating childhood interaction with nature found that 73% of adults played outdoors more often than indoors when they were young compared to only 13% of their children.[70] However, evidence of a causal relationship (i.e. whether increased screen time is causing a decrease in time spent outdoors) is mixed.[69]

We suspect that activities beyond just physical activity or time spent outdoors are being impacted by an increase in the time spent on digital technologies. For example, time spent on creative activities and time spent socialising with friends and family face to face. A study conducted in 2010 in the USA found a significant decrease in creative thinking scores since 1990 across all ages, but in particular for children in the early primary school years.[71] However, this could be reflective of a number of factors including but not limited to digital technology, like increasingly busy lifestyles with limited outlets for creativity or leisure. This could also be said for changes in levels of physical activity and time spent outdoors.

The development of digital technology that is tailored to improve physical health outcomes adds another perspective to the relationship with young people's physical and mental health. Wearable fitness devices (such as Fitbit's and Apple Watches) have emerged as a way to promote healthy levels of physical activity. While there is some indication that wearable technology can be effective in reducing sedentary behaviour, there are concerns that for adolescents, the technology may contribute to increased negative emotions such as experiences of guilt, competition and internal pressure.[72] In addition to negative emotional consequences, the use of fitness wearables may exacerbate harmful compulsions and have the potential to trigger, sustain or worsen eating disorders.[73] This is one example that highlights the complexity of the relationship between physical activity and engagement with digital technologies as it is possible to do both at the same time.

Physical and mental health are fundamentally connected. People with lived experience of mental ill-health have an increased risk of developing a chronic physical health problem, while those with a physical health condition are more likely to develop a mental health condition.[74] As young people spend increasingly more time engaged with digital technology, research on the corresponding physical impacts of usage is closely tied to current and future mental health outcomes.

Hypothesis 3: Increased use of digital technology is negatively impacting young people's mental health and wellbeing by decreasing time spent on other activities such as physical activity, and increasing negative emotions and behaviours associated with the use of wearable devices.

Comparison and connection

This domain discusses how digital technologies are impacting young people's and their families' perceptions of and connections to themselves and others.

Social comparison

Comparing our situation, abilities, opinions and appearance against others has always been used as a way of making sense of ourselves and the world around us.[75] However, with the advent of social media we are now being offered ever-present opportunities for comparison and more accessible avenues for feedback compared with offline settings, with likes, comments and number of friends or

followers all being able to be used as metrics of success.[76] People also tend to selectively present the best or idealised version of themselves on social media.[77]

Young people see their peers on social media as realistic comparisons, however they may be comparing themselves to highly edited or curated images resulting in comparison to unrealistic standards.[78] More frequent use of social media has been associated with greater levels of primarily negative social comparison, promoting the user's perception that other people are better off than they are, or have better lives than they do.[79,80] However this effect appears to be influenced somewhat by individual factors such as self-esteem, self-consciousness[80] and levels of happiness.[81] Similarly, Instagram use has been found to increase the internalisation of professional, social, sexual, and romantic ideals, and Facebook has been found to negatively affect mental health due to increased internalisation of social and romantic ideals.[82] A 2021 examination of Facebook's internal research data indicated that the company was aware that their products may negatively impact the mental health of young people, particularly teenage girls.[83]

The expansion of digital technologies has also increased exposure to targeted advertising and harmful messages around body size and shape as well as introduced the ability to digitally alter bodies through tools such as Photoshop and Facetune (sometimes referred to as 'photo manipulation'). Body image is critical to the health and development of young people; contributing to the formation of identity, the building of family and peer relationships, and influencing how young people navigate the physical and psychological changes of adolescence.[84] Online peer feedback (e.g., likes and comments) and messaging that reinforce the value of thin or muscular bodies are associated with an increase in body dissatisfaction for adolescents (and increasingly for younger children), which increases the likelihood of experiencing an eating disorder.[78,84,85,86] The use of social media sites such as Facebook and Instagram have been associated with increased body dissatisfaction for young people, especially for young women. Specifically, greater engagement in appearance-focused activities on social media, such as photo-related Facebook use (but not general Facebook use), is associated with greater body-image related thoughts such as thin-ideal internalisation, and body surveillance behaviours.[87,88]

The 'body positive' movement evolved in resistance to narrow conceptualisations of beauty that media outlets traditionally perpetuate and reinforce,[89] and was popularised through sharing on social media.[90] Body positive content on social media typically consists of photo sharing that promotes more diverse and 'natural' portrayals of bodies.[91,92] This content has been linked to positive effects including increased body satisfaction and improved mood. However, there are also concerns that this content can mirror the messaging it is attempting to negate, as it has also been found to increase self-objectification and can be highly sexualised.[89,91] In recent years, the term 'body neutrality' has gained popularity, focusing on accepting your body, rather than aiming to 'love it'. Although research is lacking, this concept is becoming frequently discussed online. These movements, typically popularised and often led by young people, demonstrate the power of digital technologies to drive social change, with impacts directly linked to mental health and wellbeing. As understanding grows around the effects of digital technologies on body image, consideration should be given to the messaging young people are absorbing, and what can be done to mitigate harm.

While there are challenges with the pressure to be 'perfect' online, connecting through digital technologies can also increase social capital, facilitate more diverse social networks and increase intercultural engagement.[93,94,95] There is some indication that some forms of online engagement can support identity development among young people. In one example, interaction when using multi-player games demonstrated the ability to engender a sense of belonging, connection and agency among players.[96] Online platforms can be even more critical for social connection among

marginalised groups – for example, it is well documented that young people who identify as LGBTIQA+ find a strong sense of belonging online.[97,98] For Aboriginal and Torres Strait Islander young people, research highlights that social media is vital for building community where there are geographical distances between family and Country.[99] When exploring ways to reduce self-comparison online, solutions should be mindful of the sense of connection and belonging that young people also find online.

Hypothesis 4: Digital technologies (mainly through social media) are negatively impacting young people's mental health and wellbeing by increasing how often young people compare themselves to unrealistic standards.

Pressures on parenting

Digital technologies have significantly shifted the way families interact and the expectations of and on parents and carers. As parental mental health strongly impacts youth mental health,[100] these shifts are important to explore. Parenting has been described as being harder now than it was 20 years ago, with a negative impact of parental mental health. The University of Melbourne collected data in 2011, 2014 and 2017, and found that parents' life satisfaction had declined overtime.[101] One of the top challenges identified by parents is digital technology.[102]

Digital technologies have resulted in a significant increase in the information available for families to consider when making parenting decisions, as well as intensifying the way families are being observed and held accountable for those decisions. This increased availability of information and resources can be beneficial for decision making, but it can also lead to increased pressure, stress and self-comparison. A 2019 survey found 60% of Australian parents expected weekly communication from their child's school, with 7% expecting daily communication.[103] Although some parents wanted this contact, a significant portion (30%) were feeling overwhelmed by the amount of information they received. Social comparison through social media has been found to lead to higher levels of parental role overload, lower levels of parental competence and higher levels of maternal depression.[104] Concern about judgement from others about parenting practices has also increased stress.[105] Despite this, digital technology can be a beneficial tool for parents to maintain social connections and reduce social isolation, as well as providing access to peer support.[106,107,108]

Parents are also concerned about managing their child's use of digital technology both in relation to online safety[109] and the impacts of excessive screen time.[101] A 2021 Australian poll of parents of children aged one month to less than 18 years found that parents' number one health concern for their children was excessive screen time.[61] Parents also acknowledge a need to manage their own digital use. The Gonski Institute for Education found that 72% of parents, carers and grandparents believed that their own technology habits influenced the habits of their children, with 73% of parents and grandparents reporting it was harder to control their child's digital habits due to their own use of screen-based devices.[52] In relation to online safety, parents and carers are typically the first place young people will go to seek support if they experience something negative when online.[110] ReachOut's research exploring parents' perceptions of social media found that despite a majority believing that it was a parents' role to keep their teenager safe on social media, almost 40% weren't sure what to do if their child experienced a safety issue and 40% felt they needed more support to know how best to talk to their teenager about social media safety.[111]

These increased pressures on parenting presented by digital technologies are occurring within a context of increased pressures on parents more broadly. For example, increased numbers of working parents[112] and use of formal childcare,[113] alongside the rising costs of childcare[114] and costs of living,[115] are all contributing to increased pressures on families. Research has highlighted that having to manage the logistics of both parents working at the same time as worrying about children contributes to increased parental stress.[102,105,116] In addition, digital technology has facilitated work demands bleeding into home hours for working parents, further adding to household stress[117] (discussed further in '*Learning, working, and disconnecting*'). Given families have a significant influence on young people's lives, family relationships and environments can contribute to the challenges young people experience. Therefore, these pressures on parents and carers are likely to have an impact on children and young people.

Hypothesis 5: Digital technologies have increased parental stress by increasing monitoring responsibilities and self-comparison, which is negatively impacting families and young people's mental health and wellbeing.

Learning, working, and disconnecting

The way in which young people engage with education and employment settings has been dramatically impacted by digital technologies. Digital delivery of material allows young people to learn about an almost inexhaustible range of topics, and proficiency with technology and learning digital skills is widely accepted as being necessary to prepare for the 'future of work'.[118,119] Eight out of 10 Australian parents believe that children need to be educated in digital skills as part of schooling.[120]

Educators recognise that the introduction of digital technology in schools brings significant benefits. In 2019, the Gonski Institute for Education surveyed educators across primary and secondary schools and found that 43% believed digital technologies enhanced their teaching and learning activities and 60% believed technology has increased accessibility and positively impacted learning experience for students with disabilities.[51] Including digital game-like elements in education has also been found to increase student participation, help develop collaboration, and encourage self-regulated learning and creativity.[50]

A major impact of digital technologies is the blurring of lines between school, work and home. As our world has become increasingly digitised, things that previously might have stayed in one life domain are easily crossing into others. One such example is exposure to bullying. Bullying is defined as "an ongoing, deliberate misuse of power in relationships through repeated verbal, physical and/or social behaviour that intends to cause physical, social and/or psychological harm".[121] Bullying has significant negative impacts on the mental and physical health of young people. Cyberbullying refers to intentional and repeated harm that others inflict via a digital device, and cyberbullying can occur through varied platforms such as texts, apps, videos, online games, and social media platforms. Cyberbullying differs from traditional bullying in that bullies can reach a larger audience, be anonymous, and have less awareness of the potential damage they inflict on victims.[122] Negative content can also be created and distributed quickly and widely, making it hard to remove from the online record.[123] While measuring the prevalence of cyberbullying is challenging due to varying definitions and interpretations, one in five young Australians aged 8 to 17 years have reported being socially excluded, threatened or abused online.[124] One in five young people also admitted to behaving in a negative way to peers online, including by name calling, deliberate exclusion or spreading lies or rumours.[124] As availability of digital technologies has increased, the potential for

cyberbullying has also increased, along with its negative impact on young people's mental health.[125] Depression, suicidality, anxiety, self-harm, low self-esteem and loneliness have all been associated with cyberbullying, however the extent to which mental health outcomes are consequences or precursors to cyberbullying is difficult to establish.[125] Evidence indicates that mental health concerns are both occurring as a result of cyberbullying, and that people who have existing mental health concerns are more likely to be bullied.[122] As digital technologies have provided an additional mechanism for bullying, this is likely to be negatively impacting young people's mental health, particularly where cyberbullying is occurring in addition to in-person bullying. It is important to note that most children and young people are adept at handling incidents they experience online. Almost all children take action when they encounter a negative experience online, with 67% of children telling their parents about the incident, 63% unfriending or blocking someone, and 41% changing their privacy or contact information in response to an incident.[126] The impact cyberbullying can have on a personal level depends on several factors, including personality traits, resilience, and contextual factors such as the social support available to victims.[122]

Another example of digitisation increasing integration of life domains is the influence on workplaces. Digital technologies have enabled more flexibility for many workplaces, but this has also made it harder to disconnect by weakening the boundaries between work and non-work time.[127] Increased workplace expectations regarding availability and correspondence have been linked to increased stress.[117] This was intensified during the COVID-19 pandemic when many organisations shifted to fully remote work. Physical tiredness, stress, anxiety, and interference with personal life and relationships are all negative consequences associated with overtime.[127] Given young people are one of the groups most likely to perform overtime in Australia, it is important to explore how organisations can promote meaningful work life balance.[128] The 'right to disconnect' refers to establishing a right for employees to cease work outside of their scheduled hours, including not responding to calls and emails that occur outside of regular hours with an expectation of reply.[127] Enforcement of this right has been explored in many countries, and more recently it has been discussed in Australia following implementation by the Victorian Police. Such policy strategies may be valuable to consider as our ways of working continue to evolve.

Hypothesis 6: Digital technologies are negatively impacting young people's mental health and wellbeing by prolonging contact with stressors (e.g. being bullied online after being bullied in school) and increasing the requirement to be accessible at all times (e.g. the expectation to spend time with friends online through apps, video chat or gaming after school).

Exposure and engagement

This domain highlights how digital technologies are increasing exposure to crisis information and inappropriate content, and discusses how young people choose to engage with this online.

Crisis exposure

Digital technologies have changed the way we access information, and the frequency with which it is available. With many disturbing crises occurring at any one time, global news can be consumed 24/7, significantly increasing our exposure to crisis events and contributing to increased stress and 'compassion fatigue'.[129,130] Young people prefer to access news through social media according to Australian research, with 75% of respondents aged 13-16 years using it to access news *often* or *sometimes* in 2020. Compared to similar research from 2017, more young Australians in 2020 said that the news made them *often* or *sometimes* feel afraid (62%), angry (60%), sad or upset (75%), with these results likely influenced by the focus on the COVID-19 pandemic in the media.[131]

Increased consumption of news around disaster events has been linked to poorer mental health outcomes in young people.[132] This can be due to the media amplifying the uncertainty felt by viewers, with uncertainty consistently being shown to contribute to increased psychological distress or anxiety.[133,134]

Information overload in and of itself can lead to 'information anxiety', the sense of feeling overwhelmed with a loss of control over situations.[135] The COVID-19 pandemic has been described as the most publicised health crisis in modern times, with pervasive and continuous information being shared globally.[130] The World Health Organization declared an 'infodemic' following concerns that people were being exposed to an excessive amount of both accurate and misinformation about COVID-19, which made it difficult to determine the accuracy of information.[136] Early findings indicate that increased consumption of news around the pandemic negatively impacted the mental health and wellbeing of young people.[129,130,132] Interestingly, one meta-analysis found that while social media was associated with increasing psychological distress, traditional news media was not.[133] Social media also had a significant association with uptake of preventative health measures whereas traditional news media failed to influence people's health behaviours.[133] This suggests that the way young people engage with social media is different than other forms of media. Australian research indicated that social media was reported as the main source of COVID-19 misinformation.[136] This research also highlighted that young people aged 18-22 were the most likely age group to fact-check news about COVID-19, suggested to be a reflection of greater levels of digital literacy.[136]

Young people have also become more aware of the discrimination that occurs locally and globally, with digital technologies providing a pathway for online activism that has varied effects on mental health and wellbeing.[99,137,138,139] Recent large social movements with a prominent online presence (such as *Black Lives Matter*, *MeToo* and *March for Our Lives*) have increased the desire, and pressure, to engage in activism, which have occurred during key developmental periods for today's young people.

Climate change is another issue that young people have passionately engaged with online, with concern escalating in both urgency and intensity in recent years. A 2021 survey of 10,000 young people (aged 16-25 years) across ten countries found that 84% were at least moderately worried by climate change, with 59% very or extremely worried.[140] Digital technology has increased the amount of information about climate change that young people can access, and it has also affected the way in which conversations about climate change happen. Social media is a major forum for climate change discourse, which allows young people to participate in public debate on a much larger scale than would have previously been possible, in an instantaneous environment.[141]

Feeling pressure to carry out activism can increase risk of mental distress,[133] and this is likely to be amplified through constantly engaging with these spaces online. However, it should be noted that young people can also feel empowered through activism. Climate change activism has been associated with building resilience and hopefulness, noting this doesn't occur exclusively online.[137,138,139] Research has also highlighted that Aboriginal and Torres Strait Islander people see social media as a source of empowerment and unity, and as an important tool for promoting heightened visibility of Indigenous activism.[99]

Having information about crises and global events is important – it informs behavioural responses and can empower young people.[142] However, when these crises are complex and there are no clear solutions, the responding anxiety can be overwhelming and make young people feel confused or hopeless.[142] It is clear there is a need to balance young people's desire and need to understand global crises and issues of concern with the burden of over-consuming information on these issues.

Hypothesis 7: Digital technologies are negatively impacting young people's mental health and wellbeing by increasing young people's exposure to information overload and crisis events, which is in turn increasing their feelings of uncertainty about the future.

Engaging with inappropriate content online

One mechanism for understanding online risk is the 4Cs framework developed by Children Online: Research and Evidence (CO:RE), which classifies content as one of four risk areas for children.[143] The eSafety Commissioner defines inappropriate content as "an image, video or written words that can be upsetting, disturbing or offensive".[144] This can be encountered intentionally or by accident, and can include content such as sexually explicit, violent, extremist or hateful material. A high proportion of young people aged 12-17 years in Australia have encountered inappropriate or hateful content online, with 57% reporting they have seen real violence that was disturbing, and nearly half of children between the age of 9-16 experience regular exposure to sexual images.[144] There are also significant gaps in parents' awareness of what their children engage with online. For example, eSafety found that despite 62% of young people aged 14-17 being exposed to negative online content, only 43% of their parents were aware.[145]

Recommender systems and algorithms play a role in young people's exposure to inappropriate content. Search engines use recommender algorithms to prioritise and serve results that match the queries of users, and social media and streaming services use recommender algorithms to personalise what is suggested and promoted to users.[146] This means that if a user spends time engaging with potentially harmful content or harmful content is going viral, they may be recommended more of the same material or increasingly harmful material in their feeds.[2]

Engaging with inappropriate content can affect mental health and wellbeing. For example, exposure to pornography has been found to contribute to unsafe sexual health practices and influence a young person's expectations around sex, subsequently contributing to sexual dissatisfaction, anxiety and fear.[147] Global research suggests lower levels of happiness with life, previous offline and online victimisation and lack of social support can increase young people's exposure to negative online content, including by increasing a tendency to seek out this content.[148]

Given that many young people are being exposed to inappropriate content regularly and at an early age,[144] it is likely this is having a negative impact on mental health and wellbeing. We theorise that digital technologies have also decreased the age at which children and young people are routinely exposed to inappropriate content, although longitudinal data isn't available to confirm this. Further research is also needed to explore the differences in mental health impacts between accidental and intentional engagement with inappropriate content. We acknowledge that different types of inappropriate content (for example, sexually explicit vs. violent material) can be encountered for different reasons, have differing impacts on the individual, and therefore require tailored policy responses. These will be further explored in our final report and advice to Government.

Hypothesis 8: Digital technologies are negatively impacting young people's mental health and wellbeing by increasing how often they interact with inappropriate content (such as sexually explicit, violent, or hateful material) and exposing them from an earlier age.

---

[2] More information about the benefits and risks of these systems is available through the eSafety Commissioner's position statement on recommender systems and algorithms, available at: https://www.esafety.gov.au/industry/tech-trends-and-challenges/recommender-systems-and-algorithms/full-position-statement

Engaging with harmful and unreliable content online

Digital technologies have changed the way mental ill-health is discussed, how support is accessed, and how health information is shared. It is increasingly common for young people to communicate their distress online, particularly to their peers. Sharing stories of mental ill-health, suicide and self-harm, when done safely, can encourage a sense of hope as well as promote help-seeking behaviours (for example, see Orygen's #chatsafe guidelines).[149]

Research exploring self-harm has highlighted that young people accessing online content about self-harm were likely to already be engaging in self-harm behaviours.[150] Young people were found to be using the internet to find support from other people who had lived experience of self-harm. They found this helpful due to the immediate nature of support available online, the stigma encountered when seeking support face-to-face, and the long wait times associated with accessing professional support.[150] Similar findings have been highlighted for social media use amongst people living with a mental health condition.[151] Social media platforms have become even more important to young people for support, community and self-expression in the wake of the COVID-19 pandemic, in particular for those experiencing depression.[9] Additionally, while online posts may express distress and potentially intensify this distress, there is currently little evidence to suggest social media causes this distress.[152,153]

However, sharing unsafe stories, can cause emotional distress or worsen existing behaviour and some young people do actively seek out online content that is harmful for their mental health.[149] Well known examples of this behaviour include 'pro-ED' or 'pro-ana' communities online that encourage and reinforce behaviours associated with eating disorders such as anorexia nervosa.[154] These groups have been found to lower social self-esteem, and sustain anorexic behaviours and beliefs.[155]

Research focused on eating disorders has also identified that it is possible to predict severity of mental ill-health up to eight months in the future based on what is being shared on Instagram.[156] This presents the possibility to predict a person's need for support via an algorithm. It is important to consider how online tools can be used to support earlier intervention, beyond redirecting to resources when someone is already in crisis.

With the growing use of social media to communicate health information, concerns are rising around the quality and reliability of information being shared. The nature of social media means that almost anyone has access to a platform to post information without verification, which can result in unreferenced or incomplete information being shared, at times by unknown authors, or with hidden conflict of interests unknown to the reader.[151,157,158]

While it is evident that young people use digital technologies to find resources that support their mental health and wellbeing, there are also communities that actively promote harm. In addition to these communities, there is also potential for unchecked or unreliable health information, no matter how well intended, to be shared widely online.

Hypothesis 9: Digital technologies are negatively impacting young people's mental health and wellbeing by increasing exposure to groups and communities that promote harmful and unreliable information about mental ill-health, self-harm and suicide.

3. Summary

There are many factors (see *Figure 1*) contributing to the increased rates of mental ill-health and distress for young people. The expansion of digital technologies is one particularly pervasive factor

that has caused significant changes across life domains for all Australians, but particularly for young people.

We know that digital technologies have become fully integrated in modern life and are here to stay. Given this, simply restricting usage is unlikely to be effective in addressing mental health concerns. Therefore, the challenge is to support and prepare young people to mitigate the potential for harm of digital technology while maximising the potential benefits, such as connection, innovation, and enjoyment.

This paper has focused on distilling the components of digital technologies which may cause harm, to ensure we have a good understanding of the problem that needs to be addressed. Please see *Table 1* for a summary of the hypotheses included throughout this paper.

Table 1. Hypotheses exploring the impacts of digital technologies on mental health

Domain	Topic	Hypotheses
Mind and body	Sleep	**Hypothesis 1:** Digital technology use, particularly before bedtime, is negatively impacting young people's mental health and wellbeing by reducing overall amount of sleep and the quality of that sleep.
	Attention	**Hypothesis 2:** Digital technologies that are designed to capture and hold attention (such as social media and other mobile apps) are negatively impacting young people's mental health and wellbeing by making it harder to pay attention to other meaningful activities that encourage a sense of self, purpose and meaning.
	Physical health and wellbeing	**Hypothesis 3:** Increased use of digital technology is negatively impacting young people's mental health and wellbeing by decreasing time spent on other activities such as physical activity, and increasing negative emotions and behaviours associated with the use of wearable devices.
Comparison and connection	Social comparison	**Hypothesis 4:** Digital technologies (mainly through social media) are negatively impacting young people's mental health and wellbeing by increasing how often young people compare themselves to unrealistic standards.
	Pressures on parenting	**Hypothesis 5:** Digital technologies have increased parental stress by increasing monitoring responsibilities and self-comparison, which is negatively impacting families and young people's mental health and wellbeing.
	Learning, working, and disconnecting	**Hypothesis 6:** Digital technologies are negatively impacting young people's mental health and wellbeing by prolonging contact with stressors (e.g. being bullied online after being bullied in school) and increasing the requirement to be accessible at all times (e.g. the expectation to spend time with friends online through apps, video chat or gaming after school).
Exposure and engagement	Crisis exposure	**Hypothesis 7:** Digital technologies are negatively impacting young people's mental health and wellbeing by increasing young people's exposure to information overload and crisis events, which is in turn increasing their feelings of uncertainty about the future.
	Engaging with inappropriate content online	**Hypothesis 8:** Digital technologies are negatively impacting young people's mental health and wellbeing by increasing how often they interact with inappropriate content (such as sexually explicit, violent, or hateful material) and exposing them from an earlier age.
	Engaging with harmful and unreliable content online	**Hypothesis 9:** Digital technologies are negatively impacting young people's mental health and wellbeing by increasing exposure to groups and communities that promote harmful and unreliable information about mental ill-health, self-harm and suicide.

References

[1] Victoria Department of Education. Teach with digital technologies [Internet]. 2019. Available from: https://www.education.vic.gov.au/school/teachers/teachingresources/digital/Pages/teach.aspx

[2] eSafety Commissioner. Glossary of terms [Internet]. Available from: https://www.esafety.gov.au/about-us/glossary

[3] Office of the Australian Information Commissioner. Social media and online privacy [Internet]. Available from: https://www.oaic.gov.au/privacy/your-privacy-rights/social-media-and-online-privacy

[4] Wilkins R, Vera-Toscano E, Botha F, Wooden M, Trinh TA. The Household, Income and Labour Dynamics in Australia survey: Selected findings from waves 1 to 20 [Internet]. Melbourne Institute: Applied Economic & Social Research, the University of Melbourne; 2022. Available from: https://melbourneinstitute.unimelb.edu.au/__data/assets/pdf_file/0009/3963249/HILDA-Statistical-Report-2021.pdf

[5] Australian Institute of Health and Welfare. Intentional self-harm hospitalisations by age groups [Internet]. 2021. Available from: https://www.aihw.gov.au/suicide-self-harm-monitoring/data/intentional-self-harm-hospitalisations/intentional-self-harm-hospitalisations-by-age-sex

[6] Australian Institute of Health and Welfare. Mental health services in Australia [Internet]. 2021. Available from: https://www.aihw.gov.au/reports/mental-health-services/mental-health-services-in-australia

[7] Harris A, Lam K, Hartup M, Collin P, Third A, Quek S. Social cohesion and participation in a digital age for diverse young Australians [Internet]. Melbourne: Centre for Resilient and Inclusive Societies; 2022. Available from: https://static1.squarespace.com/static/5d48cb4d61091100011eded9/t/624a9cef65050e3b7eecba39/1649057019276/Social+cohesion+and+participation+in+a+digital+age+Final.pdf

[8] Headspace. Insights: Youth mental health and wellbeing over time [Internet]. 2020. Available from: https://headspace.org.au/assets/Uploads/Insights-youth-mental-health-and-wellbeing-over-time-headspace-National-Youth-Mental-Health-Survey-2020.pdf

[9] Rideout V, Fox S, Peebles A, Robb MB. Coping with COVID-19: How young people use digital media to manage their mental health [Internet]. San Francisco: Common Sense and Hopelab; 2021. Available from: https://www.commonsensemedia.org/sites/default/files/research/report/2021-coping-with-covid19-full-report.pdf

[10] Dienlin T, Johannes N. The impact of digital technology use on adolescent well-being. Dialogues Clin Neurosci. 2022;22(2):135-42. DOI: 10.31887/DCNS.2020.22.2/tdienlin

[11] Jensen M, George MJ, Russell MR, Odgers CL. Young adolescents' digital technology use and mental health symptoms: Little evidence of longitudinal or daily linkages. Clin Psychol Sci. 2019;7(6):1416-33. DOI: 10.1177/2167702619859336

[12] Turel O, Ferguson C. Excessive use of technology: can tech providers be the culprits?. Communications of the ACM. 2020 Dec 17;64(1):42-4.

[13] Third A, Collin P. Rethinking (children's and young people's) citizenship through dialogues on digital practice. In: McCosker A, Vivienne S, Johns A. Negotiating digital citizenship: Control, contest and culture. United Kingdom: Rowman & Littlefield; 2016. p. 41-59.

[14] Third A, Collin P, Walsh L, Black R. Young people in digital society: Control shift. United Kingdom: Palgrave Macmillan; 2019.

[15] Livingstone S, Third A. Children and young people's rights in the digital age: An emerging agenda. New Media Soc. 2017;19(5):657-70. DOI: 10.1177/1461444816686318

[16] Livingstone S, Stoilova M, Stänicke LI, Jessen RS, Graham R, Staksrud E, et al. Young people experiencing internet-related mental health difficulties: The benefits and risks of digital skills. 2022. DOI: 10.5281/zenodo.7372552

[17] Australian Institute of Family Studies. Online safety [Internet]. 2018. Available from: https://aifs.gov.au/cfca/publications/online-safety

[18] eSafety Commissioner. Digital lives of Aussie teens [Internet]. 2020. Available from: https://www.esafety.gov.au/research/digital-lives-aussie-teens

[19] Australian Digital Inclusion Index. Explore the interactive data dashboards [Internet]. 2022. Available from: https://www.digitalinclusionindex.org.au/interactive-data-dashboards/

[20] Bartel K, Richardson C, Gradisar M. Sleep and mental wellbeing: Exploring the links [Internet]. Melbourne: Victorian Health Promotion Foundation; 2018. Available from: https://www.sleephealthfoundation.org.au/files/Sleep_and_Mental_Well_being/Sleep_and_mental_wellbeing_exploring_the_links_full_report.pdf

[21] Short MA, Chee MW. Adolescent sleep restriction effects on cognition and mood. Prog Brain Res. 2019;246(1):55-71. DOI: 10.1016/bs.pbr.2019.02.008

[22] Kahn M, Sheppes G, Sadeh A. Sleep and emotions: Bidirectional links and underlying mechanisms. Int J Psychophysiol. 2013;89(2):218-28. DOI: 10.1016/j.ijpsycho.2013.05.010

[23] Purtill J. Millions of Australians aren't getting enough sleep – and they say phones are to blame [Internet]. ABC Science; 2021. Available from: https://www.abc.net.au/news/science/2021-06-09/australia-talks-not-getting-enough-sleep-phones-to-blame/100161686

[24] Suni E. What is "revenge bedtime procrastination"? [Internet]. Sleep Foundation; 2022. Available from: https://www.sleepfoundation.org/sleep-hygiene/revenge-bedtime-procrastination

[25] Eggermont S, Van den Bulck J. Nodding off or switching off? The use of popular media as a sleep aid in secondary-school children. J Paediatr Child Health. 2006;42(7-8):428-33. DOI: 10.1111/j.1440-1754.2006.00892.x

[26] Huberty J, Green J, Glissmann C, Larkey L, Puzia M, Lee C. Efficacy of the mindfulness meditation mobile app "calm" to reduce stress among college students: Randomized controlled trial. JMIR MHealth UHealth. 2019;7(6):e14273. DOI: 10.2196/14273

[27] Neher T, Green J, Puzia M, Huberty J. Describing the use of a mindfulness-based app for sleep and mental well-being, across age, in children. Child Youth Care Forum. 2022;51(1):749-68. DOI: 10.1007/s10566-021-09651-z

[28] Bartel K, Huang C, Maddock B, Williamson P, Gradisar M. Brief school-based interventions to assist adolescents' sleep-onset latency: Comparing mindfulness and constructive worry versus controls. J Sleep Res. 2018;27(3):e12668. DOI: 10.1111/jsr.12668

[29] Cao H. Clinical effects of white noise on improving sleep quality: A literature review. Proceedings of the 2022 International Conference on Social Sciences and Humanities and Arts. 2022:476-80. DOI: 10.2991/assehr.k.220401.089

[30] Carter B, Rees P, Hale L, Bhattacharjee D, Paradkar MS. Association between portable screenbased media device access or use and sleep outcomes: A systematic review and meta-analysis. JAMA Pediatr. 2016;170(12):1202-08. DOI: 10.1001/jamapediatrics.2016.2341

[31] Alonzo R, Hussain J, Stranges S, Anderson KK. Interplay between social media use, sleep quality, and mental health in youth: A systematic review. Sleep Med Rev. 2021;56(1):101414. DOI: 10.1016/j.smrv.2020.101414

[32] Brautsch LA, Lund L, Andersen MM, Jennum PJ, Folker AP, Andersen S. Digital media use and sleep in late adolescence and young adulthood: A systematic review. Sleep Med Rev. 2022;68(1):101742. DOI: 10.1016/j.smrv.2022.101742

[33] Hale L, Li X, Hartstein LE, LeBourgeois MK. Media use and sleep in teenagers: What do we know? Curr Sleep Med Rep. 2019;5(1):128-34. DOI: 10.1007/s40675-019-00146-x

[34] Lund L, Sølvhøj IN, Danielsen D, Andersen S. Electronic media use and sleep in children and adolescents in western countries: A systematic review. BMC Public Health. 2021;21(1):1-4. DOI: 10.1186/s12889-021-11640-9

[35] Kline C. Sleep quality. In: Gellman MD, Turner JR, editors. Encyclopedia of behavioral medicine. New York: Springer; 2013. p. 1811–13.

[36] Crivello A, Barsocchi P, Girolami M, Palumbo F. The meaning of sleep quality: A survey of available technologies. IEEE Access. 2019;7:167374-90. DOI: 10.1109/ACCESS.2019.2953835

[37] Bartel K, Scheeren R, Gradisar M. Altering adolescents' pre-bedtime phone use to achieve better sleep health. Health Commun. 2019;34(4):456-462. DOI: 10.1080/10410236.2017.1422099

[38] Bartel K, Gradisar M, Williamson P. Protective and risk factors for adolescent sleep: A meta-analytic review. Sleep Med Rev. 2015;21:72-85. DOI: 10.1016/j.smrv.2014.08.002

[39] Sweetser P, Johnson D, Ozdowska A, Wyeth P. Active versus passive screen time for young children. Australas J Early Child. 2012;37(4):94-8. DOI: 10.1177/183693911203700413

[40] Bruce ES, Lunt L, McDonagh JE. Sleep in adolescents and young adults. Clin Med (Lond). 2017;17(5):424-28. DOI: 10.7861/clinmedicine.17-5-424

[41] Keyes KM, Maslowsky J, Hamilton A, Schulenberg J. The great sleep recession: Changes in sleep duration among US adolescents, 1991-2012. Pediatrics. 2021;135(3):460-8. DOI: 10.1542/peds.2014-2707

[42] Wilmer HH, Sherman LE, Chein JM. Smartphones and cognition: A review of research exploring the links between mobile technology habits and cognitive functioning. Front Psychol. 2017;8(1):605. DOI: 10.3389/fpsyg.2017.00605

[43] Slattery EJ, O'Callaghan E, Ryan P, Fortune DG, McAvinue LP. Popular interventions to enhance sustained attention in children and adolescents: A critical systematic review. Neurosci Biobehav Rev. 2022;137(1):104633. DOI: 10.1016/j.neubiorev.2022.104633

[44] Firth J, Torous J, Stubbs B, Firth JA, Steiner GZ, Smith L, Alvarez-Jimenez M, Gleeson J, Vancampfort D, Armitage CJ, Sarris J. The "online brain": How the Internet may be changing our cognition. World Psychiatry. 2019;18(2):119-29. DOI: 10.1002/wps.20617

[45] Oulasvirta A, Rattenbury T, Ma L, Raita E. Habits make smartphone use more pervasive. Pers Ubiquitous Comput. 2012;16(1):105-14. DOI: 10.1007/s00779-011-0412-2

[46] Wilmer HH, Chein JM. Mobile technology habits: Patterns of association among device usage, intertemporal preference, impulse control, and reward sensitivity. Psychon Bull Rev. 2016;23(5):1607-14. DOI: 10.3758/s13423-016-1011-z

[47] Ophir E, Nass C, Wagner AD. Cognitive control in media multitaskers. Proc Natl Acad Sci. 2009;106(37):15583-7. DOI: 10.1073/pnas.090362010

[48] Vedechkina M, Borgonovi F. A review of evidence on the role of digital technology in shaping attention and cognitive control in children. Front Psychol. 2021;12:611155. DOI: 10.3389/fpsyg.2021.611155

[49] Rockey A, Eastman S, Colin M, Merrill M. Spotlighting innovative use cases of mobile learning. The Emerging Learning Design Journal. 2019;6(1):3.

[50] Rincon-Flores EG, Santos-Guevara BN. Gamification during Covid-19: Promoting active learning and motivation in higher education. Australas J Educ Technol. 2021;37(5):43-60. DOI: 10.14742/ajet.7157

[51] Graham A, Sahlberg P. Growing up digital Australia: Phase 1 technical report [Internet]. Sydney: Gonski Institute for Education, University of New South Wales; 2020. Available from: https://www.gie.unsw.edu.au/sites/default/files/documents/UNSW%20GIE%20GUD%20Phase%201%20Technical%20Report%20MAR20%20v2.pdf

[52] Graham A, Sahlberg P. Growing up digital Australia: Phase 2 technical report [Internet]. Sydney: Gonski Institute for Education, University of New South Wales; 2021. Available from: https://www.gie.unsw.edu.au/sites/default/files/documents/GONS5000%20Growing%20Up%20Digital%20Report_FINAL.pdf

[53] Hooker SA, Masters KS, Vagnini KM, Rush CL. Engaging in personally meaningful activities is associated with meaning salience and psychological well-being. J Posit Psychol. 2020;15(6):821-31. DOI: 10.1080/17439760.2019.1651895

[54] Van Der Schuur WA, Baumgartner SE, Sumter SR, Valkenburg PM. The consequences of media multitasking for youth: A review. Comput Human Behav. 2015;53:204-15. DOI: 10.1016/j.chb.2015.06.035

[55] Klimstra TA, van Doeselaar L. Identity formation in adolescence and young adulthood. Personality development across the lifespan. Academic Press; 2017. p. 293-308.

[56] Arbeau K, Thorpe C, Stinson M, Budlong B, Wolff J. The meaning of the experience of being an online video game player. Comput Hum Behav. 2020;2:100013. DOI: 10.1016/j.chbr.2020.100013

[57] Vogels A, Gelles-Watnick R, Massarat N. Teens, social media and technology 2022 [Internet]. Pew Research Centre; 2022. Available from: https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/

[58] McDool E, Powell P, Roberts J, Taylor K. The internet and children's psychological wellbeing. J Health Econ. 2020;69(1):102274. DOI: 10.1016/j.jhealeco.2019.102274

[59] Park JH, Moon JH, Kim HJ, Kong MH, Oh YH. Sedentary lifestyle: Overview of updated evidence of potential health risks. Korean J Fam Med. 2020;41(6):365-373. DOI: 10.4082/kjfm.20.0165

[60] Department of Health and Aged Care. About physical activity and exercise [Internet]. 2021. Available from: https://www.health.gov.au/topics/physical-activity-and-exercise/about-physical-activity-and-exercise#what-we-mean-by-sedentary-behaviour-and-physical-inactivity

[61] Royal Children's Hospital Melbourne. Top ten child health problems: What Australian parents think [Internet]. 2021. Available from: https://www.rchpoll.org.au/polls/top-10-child-health-problems-what-australian-parents-think/

[62] Healthdirect. Good mental health [Internet]. 2021. Available from: https://www.healthdirect.gov.au/good-mental-health#:~:text=Tips%20for%20good%20mental%20health%201%20Build%20relationships,Spirituality%20or%20religion%20...%208%20Seek%20help%20

[63] Harris KM, King RB, Gordon-Larsen P. Healthy habits among adolescents: Sleep, exercise, diet, and body image. In: Lippman L, Moore K, editors. Conceptualizing and measuring indicators of positive development: What do children need to flourish? New York: Springer; 2005. p. 111-32.

[64] Heinsch M, Wells H, Sampson D, Wootten A, Cupples M, Sutton C, Kay-Lambkin F. Protective factors for mental and psychological wellbeing in Australian adults: A review. Ment Health Prev. 2022;25:200192. DOI: 10.1016/j.mhp.2020.200192

[65] Mustafaoglu R, Zirek E, Yasacı Z, Ozdincler A. The negative effects of digital technology usage on children's development and health. Addicta: The Turkish Journal on Addictions. 2018;5(2):227-47. DOI: 10.15805/addicta.2018.5.2.0051

[66] Robinson TN, Banda JA, Hale L, Lu AS, Fleming-Milici F, Calvert SL, et al. Screen media exposure and obesity in children and adolescents. Pediatr. 2017;140(2):97–101. DOI: 10.1542/ peds.2016-1758K

[67] Goodyear VA, Wood G, Skinner B, Thompson J. The effect of social media interventions on physical activity and dietary behaviours in young people and adults: A systematic review. Int J Behav Nutr Phys Act. 2021;18(72). DOI: 10.1186/s12966-021-01138-3

[68] Aziz N, Nordin MJ, Abdulkadir SJ, Salih M. Digital addiction: Systematic review of computer game addiction impact on adolescent physical health. Electronics. 2021;10(9):996. DOI: 10.3390/electronics10090996

[69] Oswald TK, Rumbold AR, Kedzior SG, Moore VM. Psychological impacts of "screen time" and "green time" for children and adolescents: A systematic scoping review. PloS one. 2020;15(9):e0237725. DOI: 10.1371/journal.pone.0237725

[70] Planet Ark. Climbing trees: Getting Aussie kids back outdoors [Internet]. 2011. Available from: https://treeday.planetark.org/documents/doc-534-climbing-trees-research-report-2011-07-13-final.pdf

[71] Kim KH. The creativity crisis: The decrease in creative thinking scores on the Torrance Tests of Creative Thinking. Creat Res J. 2011;23(4):285-95. DOI: 10.1080/10400419.2011.627805

[72] O'Keeffe N, Scheid JL, West SL. Sedentary behavior and the use of wearable technology: An editorial. Int J Environ Res Public Health. 2020; 17(12):4181. DOI: 10.3390/ijerph17124181

[73] Blackstone S, Herrmann L. Fitness wearables and exercise dependence in college women: Considerations for university health education specialists. Am J Health Educ. 2020;51(4):225-233. DOI: 10.1080/19325037.2020.1767004

[74] Harris B, Nichols T. Improving Australia's mental and physical health: A connected approach [Internet]. Melbourne: Mitchell Institute, Victoria University; 2019. Available from: https://www.vu.edu.au/sites/default/files/physical-and-mental-health-policy-evidence-brief-mitchell-institute.pdf

[75] Buunk BP, Gibbons FX. Toward an enlightenment in social comparison theory: Moving beyond classic and Renaissance approaches. In: Suls J, Wheeler L, editors. Handbook of social comparison: Theory and research. Kluwer Academic Publishers; 2000. p. 487-99.

[76] Appel H, Gerlach AL, Crusius J. The interplay between Facebook use, social comparison, envy, and depression. Curr Opin Psychol. 2016;9:44-9. DOI: 10.1016/j.copsyc.2015.10.006

[77] Vogel EA, Rose JP, Roberts LR, Eckles K. Social comparison, social media, and self-esteem. Psychol Pop Media Cult. 2014;3(4):206. DOI: 10.1037/ppm0000047

[78] Nesi J, Telzer EH, Prinstein MJ. Handbook of adolescent digital media use and mental health. United Kingdom: Cambridge University Press; 2022.

[79] Lee SY. How do people compare themselves with others on social network sites?: The case of Facebook. Comput Hum Behav. 2014;32:253-60. DOI: 10.1016/j.chb.2013.12.009

[80] Jiang S, Ngien A. The effects of Instagram use, social comparison, and self-esteem on social anxiety: A survey study in Singapore. Soc Media Soc. 2020;6(2):2056305120912488. DOI: 10.1177/2056305120912488

[81] De Vries DA, Kühne R. Facebook and self-perception: Individual susceptibility to negative social comparison on Facebook. Pers Individ Differ. 2015;86:217-21. DOI: 10.1016/j.paid.2015.05.029

[82] de Lenne O, Vandenbosch L, Eggermont S, Karsay K, Trekels J. Picture-perfect lives on social media: A cross-national study on the role of media ideals in adolescent well-being. Media Psychol. 2020;23(1):52-78. DOI: 10.1080/15213269.2018.1554494

[83] Choukas-Bradley S, Roberts SR, Maheux AJ, Nesi J. The perfect storm: A developmental–sociocultural framework for the role of social media in adolescent girls' body image concerns and mental health. Clin Child Fam Psychol Rev. 2021;25:681–701. DOI: 10.1007/s10567-022-00404-5

[84] Markey CN. Invited commentary: Why body image is important to adolescent development. J Youth Adolesc. 2010;39(12):1387-91. DOI: 10.1007/s10964-010-9510-0

[85] Uchôa FN, Uchôa NM, Daniele TM, Lustosa RP, Garrido ND, Deana NF, Aranha A, Alves N. Influence of the mass media and body dissatisfaction on the risk in adolescents of developing eating disorders. Int J Environ Res Public Health. 2019;16(8):1-14. DOI: 10.3390/ijerph16091508

[86] Rosewall JK, Gleaves DH, Latner JD. An examination of risk factors that moderate the body dissatisfaction-eating pathology relationship among New Zealand adolescent girls. J Eat Disord. 2018;6(38):1-10. DOI: 10.1186/s40337-018-0225-z

[87] Cohen R, Newton-John T, Slater A. The relationship between Facebook and Instagram appearance-focused activities and body image concerns in young women. Body Image. 2017;23(1):183-7. DOI: 10.1016/j.bodyim.2017.10.002

[88] Rodgers RF, Melioli T. The relationship between body image concerns, eating disorders and internet use, part I: A review of empirical support. Adolesc Res Rev. 2016;1:95-119. DOI: 10.1007/s40894-015-0016-6

[89] Vendemia MA, DeAndrea DC, Brathwaite KN. Objectifying the body positive movement: The effects of sexualizing and digitally modifying body-positive images on Instagram. Body Image. 2021;38:137-47. DOI: 10.1016/j.bodyim.2021.03.017

[90] Rodgers RF, Meyer C, McCaig D. Characterizing a body positive online forum: Resistance and pursuit of appearance-ideals. Body image. 2020;33:199-206. DOI: 10.1016/j.bodyim.2020.03.005

[91] Cohen R, Fardouly J, Newton-John T, Slater A. #BoPo on Instagram: An experimental investigation of the effects of viewing body positive content on young women's mood and body image. New Media Soc. 2019;21(7):1546-64. DOI: 10.1177/146144481982653

[92] Lazuka RF, Wick MR, Keel PK, Harriger JA. Are we there yet? Progress in depicting diverse images of beauty in Instagram's body positivity movement. Body image. 2020;34:85-93. DOI: 10.1016/j.bodyim.2020.05.001

[93] Culver SH, Kerr P. Global citizenship in a digital world [Internet]. Sweden: The International Clearinghouse on Children, Youth and Media; 2014. Available from: https://milunesco.unaoc.org/wp-content/uploads/2015/03/global_citizenship_in_a_digital_world.pdf

[94] Leurs K, Ponzanesi S. Communicative spaces of their own: Migrant girls performing selves using instant messaging software. Fem Rev. 2011;99(1):55-78. DOI: 10.1057/fr.2011.39

[95] Leurs, K. Digital passages: Migrant youth 2.0: Diaspora, gender and youth cultural intersections. Amsterdam: Amsterdam University Press; 2015.

[96] Granic I, Morita H, Scholten H. Beyond screen time: Identity development in the digital age. Psychol Inq. 2020;31(3):195-223. DOI: 10.1080/1047840X.2020.1820214

[97] Pullen C, Cooper M. LGBT identity and online new media. London: Routledge; 2010.

[98] Hanckel B, Morris A. Finding community and contesting heteronormativity: Queer young people's engagement in an Australian online community. J Youth Stud. 2014;17(7):872-86. DOI: 10.1080/13676261.2013.878792

[99] Kennedy T. Indigenous peoples' experiences of harmful content on social media [Internet]. Sydney: Macquarie University; 2020. Available from: https://research-management.mq.edu.au/ws/portalfiles/portal/135775224/MQU_HarmfulContentonSocialMedia_report_201202.pdf

[100] Emerging Minds. Parental mental health and parenting: how are they related? [Internet]. 2020. Available from: https://emergingminds.com.au/resources/parental-mental-health-and-parenting-how-are-they-related/

[101] Fu E, Chesters J, Cuervo H. Parenting in the twenty-first century: Preparing the next generation of Australians for uncertain futures [Internet]. Melbourne: Melbourne Graduate School of Education; 2019. Available from: https://documents.pub/document/parenting-in-the-twenty-first-century-preparing-the-availability-of-maternitypaternity.html?page=1

[102] Auxier B, Anderson M, Perrin A, Turner E. Parenting children in the age of screens [Internet]. Pew Research Center; 2020. Available from: https://www.pewresearch.org/internet/2020/07/28/parenting-children-in-the-age-of-screens/

[103] McCrindle. The future of education [Internet]. 2019. Available from: https://mccrindle.com.au/wp-content/uploads/images/Education-Future-Report_2019.pdf

[104] Coyne SM, McDaniel BT, Stockdale LA. "Do you dare to compare?" Associations between maternal social comparisons on social networking sites and parenting, mental health, and romantic relationship outcomes. Comput Human Behav. 2017;70:335-40. DOI: 10.1016/j.chb.2016.12.081

[105] Tucci J, Mitchell J, Goddard CR. The changing face of parenting: Exploring the attitudes of parents in contemporary Australia [Internet]. Australian Childhood Foundation, National Research Centre for the Prevention of Child Abuse; 2005. Available from: https://skat.ihmc.us/rid=1LHK0M4D8-VHTVWG-2H81/The%20Changing%20Face%20of%20Parenting.pdf

[106] Price SL, Aston M, Monaghan J, Sim M, Tomblin Murphy G, Etowa J, Pickles M, Hunter A, Little V. Maternal knowing and social networks: Understanding first-time mothers' search for information and support through online and offline social networks. Qual Health Res. 2018;28(10):1552-63. DOI: 10.1177/1049732317748314

[107] Johnson SA. 'Intimate mothering publics': Comparing face-to-face support groups and Internet use for women seeking information and advice in the transition to first-time motherhood. Culture, Health and Sexuality. 2015;17(2):237-51. DOI: 10.1080/13691058.2014.968807

[108] Valtchanov BL, Parry DC, Glover TD, Mulcahy CM. Neighborhood at your fingertips: Transforming community online through a Canadian social networking site for mothers. Gend Technol Dev. 2014;18(2):187-217. DOI: 10.1177/0971852414529481

[109] eSafety Commissioner. Parenting in the digital age [Internet]. Available from: https://www.esafety.gov.au/research/parenting-digital-age

[110] Moody L, Marsden L, Nguyen B, Third A. Consultations with young people to inform the eSafety Commissioner's Engagement Strategy for Young People [Internet]. Sydney: Young and Resilient Research Centre, Western Sydney University; 2021. Available from: https://www.esafety.gov.au/sites/default/files/2022-01/YRRC%20Research%20Report%20eSafety%202021_web%20V06%20-%20publishing_1.pdf

[111] Reachout. New research highlights Aussie parents' need for support when it comes to teens and social media [Internet]. 2021. Available from: https://about.au.reachout.com/blog/parents-guide-to-instagram

[112] Australian Institute of Family Studies. Work and family [Internet]. 2021. Available from: https://aifs.gov.au/facts-and-figures/work-and-family

[113] Australian Institute of Health and Welfare. Childcare and early childhood education [Internet]. 2021. Available from: https://www.aihw.gov.au/reports/australias-welfare/childcare-and-early-childhood-education

[114] Wilkins R, Laß I, Butterworth P, Vera-Toscano E. The Household, Income and Labour Dynamics in Australia Survey (HILDA): Selected findings from waves 1 to 17 [Internet]. Melbourne Institute: Applied Economic & Social Research, the University of Melbourne; 2019. Available from: https://melbourneinstitute.unimelb.edu.au/__data/assets/pdf_file/0010/3398464/HILDA-Statistical-Report2019.pdf

[115] Kohler A. Inflation, cost of living increases leave people struggling to afford everyday items [Internet]. ABC News; 2022. Available from: https://www.abc.net.au/news/2022-03-22/getting-left-behind-as-the-cost-of-living-goes-up/100927776

[116] Stechyson N. Yes, being a parent really is harder than ever [Internet]. 2020. Available from: https://www.huffpost.com/archive/ca/entry/parent-burnout-study_ca_5e2708dbc5b632117619de6a

[117] Eurofound and the International Labour Office. Working anytime, anywhere: The effects on the world of work [Internet]. 2017. Available from: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_544138.pdf

[118] The Royal Australian and New Zealand College of Psychiatrists. The impact of media and digital technology on children and adolescents [Internet]. 2018. Available from: https://www.ranzcp.org/news-policy/policy-and-advocacy/position-statements/media-digital-technology-impact-on-children

[119] Australian Industry and Skills Committee. National overview: Digital skills [Internet]. 2022. Available from: https://nationalindustryinsights.aisc.net.au/national/digital-skills

[120] Australian Information Industry Association. Digital skills and careers [Internet]. 2015. Available from: https://aiia.com.au/wp-content/uploads/2021/03/A-Digital_Skills_and_Careers_Report.pdf

[121] Bullying No Way. Understanding bullying [Internet]. 2021. Available from: https://bullyingnoway.gov.au/understanding-bullying

[122] CORE. What is cyberbullying and how does it affect kids? [Internet]. 2022. Available from: https://core-evidence.eu/posts/what-is-cyberbullying-and-how-does-it-affect-kids

[123] Australian Institute of Health and Welfare. Bullying and negative online experiences [Internet]. 2021. Available from: https://www.aihw.gov.au/reports/children-youth/negative-online-experiences

[124] eSafety Commissioner. Cyberbullying: Factsheet [Internet]. 2020. Available from: https://www.esafety.gov.au/educators/training-for-professionals/professional-learning-program-teachers/cyberbullying-factsheet

[125] Kwan I, Dickson K, Richardson M, MacDowall W, Burchett H, Stansfield C, Brunton G, Sutcliffe K, Thomas J. Cyberbullying and children and young people's mental health: A systematic map of systematic reviews. Cyberpsychol Behav Soc Netw. 2020;23(2):72-82. DOI: 10.1089/cyber.2019.0370

[126] eSafety Commissioner. Children's online lives [Internet]. 2021. Available from: https://www.esafety.gov.au/research/mind-gap/childrens-online-lives

[127] Littleton E, Raynes L. Call me maybe (not): Working overtime and a right to disconnect in Australia [Internet]. The Centre for Future Work at the Australia Institute; 2022. Available from: https://australiainstitute.org.au/wp-content/uploads/2022/11/Call-Me-Maybe-Not-2022-WEB.pdf

[128] Littleton E. Theft by any other name: Unsatisfactory working hours and unpaid overtime 2022 update [Internet]. The Centre for Future Work at the Australia Institute; 2022. Available from: https://www.gohomeontimeday.org.au/img/materials/Go-Home-On-Time-Day-2022.pdf

[129] Holman EA, Garfin DR, Silver RC. Media's role in broadcasting acute stress following the Boston Marathon bombings. Proc Natl Acad Sci U S A. 2014;111(1):93-8. DOI: 10.1073/pnas.131626511

[130] Taylor L. Compassion fatigue: How much is too much bad news? [Internet]. 2014. Available from: https://www.sbs.com.au/news/article/compassion-fatigue-how-much-is-too-much-bad-news/je23bo0vq

[131] Notley T, Dezuanni M, Zhong HF, Chambers S. News and young Australians in 2020: How young people access, perceive and are affected by news media [Internet]. Sydney: Western Sydney University, Queensland University of Technology; 2020. Available from: https://www.westernsydney.edu.au/__data/assets/pdf_file/0009/1717875/News_and_Young_Australians_in_2020_web.pdf

[132] Strasser MA, Sumner PJ, Meyer D. COVID-19 news consumption and distress in young people: A systematic review. J Affect Disord. 2022;300:481-91. DOI: 10.1016/j.jad.2022.01.007

[133] Chu TH, Yeo TE, Su Y. Effects of exposure to COVID-19 news and information: A meta-analysis of media use and uncertainty-related responses during the pandemic. Journal Mass Commun Q. 2022;99(1):89-112.

[134] Afifi WA, Felix ED, Afifi TD. The impact of uncertainty and communal coping on mental health following natural disasters. Anxiety Stress Coping. 2012;25(3):329-47. DOI: 10.1080/10615806.2011.603048

[135] Bawden D, Robinson L. The dark side of information: Overload, anxiety and other paradoxes and pathologies. J Inf Sci. 2009;35(2):180-91. DOI: 10.1177/0165551508095781

[136] Park S, Fisher C, Lee JY, Mcguinness K. COVID-19: Australian news and misinformation [Internet]. Canberra: News Media Research Centre, University of Canberra; 2020. Available from: https://www.canberra.edu.au/research/faculty-research-centres/nmrc/publications/documents/COVID-19-Australian-news-and-misinformation.pdf

[137] Sanson A, Bellemo M. Children and youth in the climate crisis. BJPsych Bull. 2021;45(4):205-9. DOI: 10.1192/bjb.2021.16

[138] Gislason MK, Kennedy AM, Witham SM. The interplay between social and ecological determinants of mental health for children and youth in the climate crisis. Int J Environ Res Public Health. 2021;18(9):4573. DOI: 10.3390/ijerph18094573

[139] Godden NJ, Farrant BM, Yallup Farrant J, Heyink E, Carot Collins E, Burgemeister B, Tabeshfar M, Barrow J, West M, Kieft J, Rothwell M. Climate change, activism, and supporting the mental health of children and young people: Perspectives from Western Australia. J Paediatr Child Health. 2021;57(11):1759-64. DOI: 10.1111/jpc.15649

[140] Marks E, Hickman C, Pihkala P, Clayton S, Lewandowski ER, Mayall EE, Wray B, Mellor C, van Susteren L. Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon. 2021. DOI: 10.2139/ssrn.3918955

[141] Williams HT, McMurray JR, Kurz T, Lambert FH. Network analysis reveals open forums and echo chambers in social media discussions of climate change. Glob Environ Change. 2015;1(32):126-38. DOI: 10.1016/j.gloenvcha.2015.03.006

[142] Hickman C, Marks E, Pihkala P, Clayton S, Lewandowski RE, Mayall EE, Wray B, Mellor C, van Susteren L. Climate anxiety in children and young people and their beliefs about government responses to climate change: A global survey. Lancet Planet Health. 2021;5(12):e863-73. DOI: 10.1016/S2542-5196(21)00278-3

[143] Livingstone S, Stoilova M. The 4Cs: Classifying online risk to children. CO:RE short report series: Key topics [Internet]. Hamburg: Leibniz-Institut für Medienforschung, Hans-Bredow-Institut; 2021. Available from: https://doi.org/10.21241/ssoar.71817

[144] eSafety Commissioner. Inappropriate content: Factsheet [Internet]. Available from: https://www.esafety.gov.au/educators/training-for-professionals/professional-learning-program-teachers/inappropriate-content-factsheet

[145] eSafety Commissioner. Parental awareness [Internet]. Available from: https://www.esafety.gov.au/research/mind-gap-parental-awareness-childrens-exposure-risks-online/parental-awareness

[146] eSafety Commissioner. Recommender systems and algorithms [Internet]. Available from: https://www.esafety.gov.au/industry/tech-trends-and-challenges/recommender-systems-and-algorithms

[147] Quadara A, El-Murr A, Latham J. The effects of pornography on children and young people: An evidence scan [Internet]. Melbourne: Australian Institute of Family Studies; 2017. Available from: https://aifs.gov.au/research/research-reports/effects-pornography-children-and-young-people

[148] Stoilova M, Livingstone S, Khazbak R. Investigating risks and opportunities for children in a digital world: A rapid review of the evidence on children's internet use and outcomes [Internet]. Unicef; 2020. Available from: https://www.unicef-irc.org/publications/1183-investigating-risks-and-opportunities-for-children-in-a-digital-world.html

[149] Thorn P, McKay S, Hemming L, Reavley M, La Sala L, Sabo A, McCormack T, Battersby-Coulter R, Cooper C, Lamblin M, Robinson J. #Chatsafe: A young person's guide to communicating safely online about self-harm and suicide [Internet]. Melbourne: Orygen; 2023. Available from: https://www.orygen.org.au/Training/Resources/Self-harm-and-suicide-prevention/Guidelines/chatsafe-A-young-person-s-guide-for-communicatin

[150] Lavis A, Winter R. #Online harms or benefits? An ethnographic analysis of the positives and negatives of peer-support around self-harm on social media. J Child Psychol Psychiatry. 2020;61(8):842-54. DOI: 10.1111/jcpp.13245

[151] Naslund JA, Bondre A, Torous J, Aschbrenner KA. Social media and mental health: Benefits, risks, and opportunities for research and practice. J Technol Behav Sci. 2020;5:245-57. DOI: 10.1007/s41347-020-00134-x

[152] Ortiz P, Khin Khin E. Traditional and new media's influence on suicidal behavior and contagion. Behav Sci Law. 2018;36(2):245-56. DOI: 10.1002/bsl.2338

[153] Marchant A, Hawton K, Stewart A, Montgomery P, Singaravelu V, Lloyd K, Purdy N, Daine K, John A. A systematic review of the relationship between internet use, self-harm and suicidal behaviour in young people: The good, the bad and the unknown. PloS One. 2017;12(8):e0181722. DOI: 10.1371/journal.pone.0181722

[154] Wang T, Brede M, Ianni A, Mentzakis E. Social interactions in online eating disorder communities: A network perspective. PloS One. 2018;13(7):e0200800. DOI: 10.1371/journal.pone.0200800

[155] Rennick-Egglestone S, Morgan K, Llewellyn-Beardsley J, Ramsay A, McGranahan R, Gillard S, Hui A, Ng F, Schneider J, Booth S, Pinfold V. Mental health recovery narratives and their impact on recipients: Systematic review and narrative synthesis. Can J Psychiatry. 2019;64(10):669-79. DOI: 10.1177/0706743719846108

[156] Chancellor S, Lin Z, Goodman EL, Zerwas S, De Choudhury M. Quantifying and predicting mental illness severity in online pro-eating disorder communities. Association for Computing Machinery. 2016:1171-1184. DOI: 10.1145/2818048.2819973

[157] Moorhead SA, Hazlett DE, Harrison L, Carroll JK, Irwin A, Hoving C. A new dimension of health care: Systematic review of the uses, benefits, and limitations of social media for health communication. J Med Internet Res. 2013;15(4):e1933. DOI: 10.2196/jmir.1933

[158] Ventola CL. Social media and health care professionals: Benefits, risks, and best practices. Pharmacy and Therapeutics. 2014;39(7):491-9.