



DO YOUNG PEOPLE FEEL WORSE IN A DIGITAL WORLD?

A Research Review on How Digital Media Affects the Mental Wellbeing of Young People

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Foreword

Today, children and young people spend a large part of their waking hours in different digital worlds. Since the smartphone has become their primary companion, more young people report mental health issues and consume both more healthcare and antidepressants. Digital media gives all of us unimagined possibilities to express, educate and entertain ourselves. However, it is important that phenomena and activities that have such a widespread impact are studied closer. It is the adults' responsibility to make sure that young people are allowed to grow up and develop into confident individuals who can fulfill their potential, handle adversity and contribute to society.

With this research review, Mind wants to increase the understanding and awareness of parents, policy makers and tech developers so that they promote using digital media in a way that strengthens the mental wellbeing of children and young people. Our focus has been young people's use in Nordic countries. The report is published in Swedish, Norwegian, Danish and Finnish, as well as English, with specific sections with data pertaining to each country.

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We have been helped by an advisory expert group, a round table discussion with interested parties and a focus group with young people. We have also cooperated with representatives from other non-governmental institutions in the Nordic countries, such as Mental Helse Ungdom, Det Sociale Netværk, MIELI Mental Health Finland.

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Abstract

In just a short time span, digitalisation has changed our lives. Digital media is a natural part of life for most young people. Despite the fact that clinical psychiatric conditions, like depression and anxiety disorder, have not increased in the Nordic countries, several reports show that more young people struggle with mental health issues. The question is what role digital media plays in this development. This report aims to provide a research review surrounding three main questions: What is the relation between mental wellbeing in young people and the time spent on 1) digital media in general, and the two specific activities 2) social media and 3) gaming? There is a need for further research investigating causal relations for all questions.

Time Spent on Digital Media

Studies show that young people who spend a limited amount of time with digital media are more likely to report higher mental wellbeing compared to young people who spend no time at all with digital media. Conversely, those who spend substantial time on digital media are more likely to report lower wellbeing. So far, the question of causality still remains unanswered.

There are indications that the negative effects can be a result of lack of sleep, lack of exercise, and less time for schoolwork. Underlying factors that are associated with an increased risk for lower mental wellbeing linked to digital media use are: female gender (especially in relation to social media); being younger; neurodevelopmental disorders; and low socioeconomic status.

Social Media

At a group level, research shows that children and youths who spend a substantial amount of time on social media have a tendency to feel slightly worse over time. However, the effect is small. The association can be explained by the fact that high

users of social media as a group sleep less (indirect effect) and have an increased risk of being subject to online harassment (direct effect). How social media is used seems to be an important factor. Among adults, passive usage of social media seems to have a negative impact on wellbeing by adding to jealousy and feeling low, whereas an active usage can have positive effects like strengthening relations. It is likely that the same is true for young users too. Young people who suffer from mental health issues can utilize social media to find support, information and share experiences. However, there is a risk of getting caught in an environment which normalizes mental health issues and gives inaccurate advice, which can exacerbate issues like deliberate self-harm. Several other factors seem to play a part in the effects of social media. Female users, users with low self-esteem, users who compare themselves to others, or already feel despondent, are affected more negatively by using social media than other users. It can be especially important to get support promoting a healthy usage for people with these types of vulnerabilities.

Gaming

Research on young people and gaming has largely been focused on other effects of gaming rather than mental wellbeing, for example how gaming affects cognitive functions or tendencies for violence. Among older children, there is no apparent link between gaming and mental wellbeing. However, among children below the age of 11, there is some support for a negative association between gaming and mental wellbeing. For many, gaming is associated with positive aspects, such as entertainment, a sense of development and as a way to socialize. Games which involve physical activities, so called exercise games, seem to promote movement and exercise. Users who



You sit on the couch and scroll social media for some relaxation, but is it really relaxing? You get very stimulated.

play as a way to avoid life problems and difficult emotions can get a temporary sense of relief, but research shows that this can become problematic and have long term negative effects. A minority of gamers develop gaming disorder, where the user loses control over their gaming, despite serious negative impact on other parts of their life, such as relationships, schoolwork and sleep. Vulnerabilities such as difficulties handling emotions, neurodevelopmental disorders, difficulties in school, being socially excluded, and/or limited support from parents are all factors which increase the risk of developing gaming disorder.

Conclusion

Today, digital media is a central part in the lives of both young people and adults. However, so far the knowledge about the effects on young people's wellbeing is limited and there is a need for further, clarifying research assessing cause and effect. The current state of research shows that the impact of digital media depends on who you are, how you use it, how much you use it, as well as other aspects of your life. There is an increased

vulnerability for young users and children with existing issues (neurodevelopmental disorders, low self-esteem, feeling low, low socioeconomic status etc) warranting a particular need for support and promotion of sound media usage in these children. When it comes to social media, there is a weak negative association between time spent and wellbeing, as well as for particular content and wellbeing. Besides the risk of dysfunctional usage which can become a problem, gaming seems to have a limited impact on young people's wellbeing.

Research informs us about evident patterns for groups of people as an average, and can therefore guide which efforts, initiatives and decisions that are likely to affect, in this case, wellbeing on a societal level. With regards to the individual level, it is important to consider the whole picture for each specific individual in order to promote wellbeing rather than strictly applying the general research findings. One of the main conclusions from this report highlights the importance of fulfilling the basic human needs in order to create the best possible conditions to face the inevitable challenges of life.

1. Introduction

The digitalisation brought on by the Internet has undoubtedly been extremely rapid and today many traditional media are also found online or have even been replaced by online versions. Out of the Nordic populations, between 81 and 91 percent are online daily¹ and the smartphone has become the most used tool for these online activities. Over the course of less than ten years, the smartphone penetration rate among young people between the ages of 13 and 18 has gone from 0 to more than 95 percent in the Nordic countries, and a clear majority now use their smartphone more than two hours each day. For example, two out of five in Sweden and Finland report spending more than four hours per day with their smartphone^{2,3} – in other words, more than a fourth of their waking hours. Considering all the functions available on a smartphone, this scope is in no way difficult to understand. Constant and immediate access to all the information in the world, entertainment, contact with friends and strangers, or perhaps just a moment of undemanding escape from reality – right at our fingertips. This technological development creates new opportunities for us to interact, learn, explore and express our identity, or just observe. However, this rapid technological development/innovation also creates new uncertainties, and scientists, tech companies, parents and medical professionals all over the world are now asking the same question: What impact does our digital media usage have on our mental wellbeing?

This impact is of particular importance for young people that are growing up in a time with rapid technological progress coupled with little informed involvement from adults and lack of evidence from research providing knowledge on what signifies healthy usage. Over the last few years, there has been a growing number of reports on the negative impacts of digital technology on young people's mental health. Media has reported on studies which show a correlation between young people's screen time and symptoms of depression, anxiety and sleep problems, yet often the message is contradictory. Does social media make us happy or sad, and



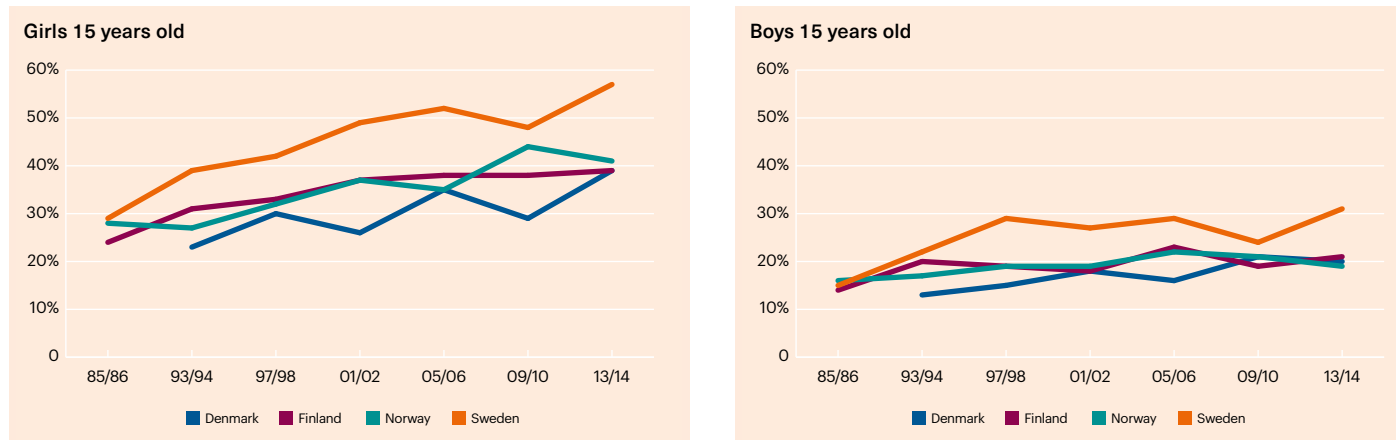


Figure 1 Compilation of the development of psychosomatic symptoms done by the Public Health Agency of Sweden, based on the World Health Organisation’s study of school children’s health habits. The chart shows that the proportion of 15-year-olds who reports a minimum of psychosomatic symptoms (such as headaches, sleep problems, irritability, feeling low etc) per week over the last six months.

is it the time spent or the type of content which decides the outcome? When a research field is both complex and new – not least because of the social media platforms constantly changing, we have to expect a period of time without absolute truths. Different research reports come to different conclusions, and as in other issues, media highlights the most extreme interpretations, polarizing the debate between being “for” or “against” digital learning tools, social media, gaming and young children using tablets. The objective of this report is to give a clear overview and conclusion of the current state of research on young people in the Nordic countries and how their digital usage is connected to their mental wellbeing and based on these conclusions provide recommendations for different target groups.

Background

Mental Health Problems and Young People in the Nordic Countries

Young people’s mental health problems are of high priority for all of society. It is of particular concern for the organization

Mind that provides support for people suffering from mental health problems. In 2018, Mind published the report *Unga mår allt sämre – eller?*⁴ (Mental health problems in youth are on the rise – or are they?) a research review on young people’s mental wellbeing in Sweden. Among other things, the report concluded that self-reported mental health problems had increased among young people in Sweden, with an increased number of young people reporting psychosomatic symptoms and sleep problems. An increasing number has also contacted primary health care for these symptoms.⁵

Internationally, anxiety and mental health issues among teenagers have increased over time, with the largest increase among teenage girls.⁶ The same difference between the genders is also observed in the Nordic countries, where Swedish girls show the largest decline in wellbeing (Figure 1). The proportion of girls who report feeling at least two psychosomatic symptoms (stomach aches, difficulties sleeping, despondency, etc.) per week during the last six months has increased. It is worth acknowledging that this negative trend started long before, for

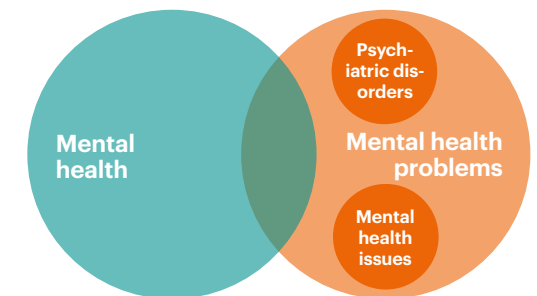
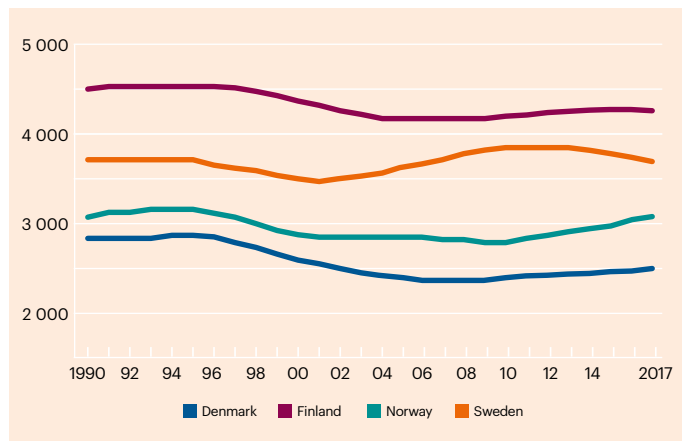


Figure 2 The Public Health Agency of Sweden’s explanation of terms connected to mental health which illustrate how mental health problems includes both mild mental health issues and more serious conditions and disorders.

example, social media, became a possible contributing factor.

When it comes to mental health, there is a need for clarity in the definitions and terms being used, and how these have been used in the scope of the research. These distinctions are important, because at the same time as national health reviews show the symptoms of mental health issues are increasing, the number of clinical psychiatric diagnosis has remained much the same since 1990. The term, mental health problems covers both less severe mental health issues as well as more severe clinical psychiatric conditions and disorders.

The general pattern of development suggests that all aspects of mental health problems have not necessarily increased among young people. However, more young people feel that they have some form of mental health issues, a trend which has to be taken seriously. There is a need to increase our understanding of the underlying factors contributing to young people's mental wellbeing in order to provide sufficient support, regardless if it concerns mental health issues or clinical conditions.



Figur 3 Rate of clinical depression among young people ages 10–24 in the nordic countries, spanning from 1990 til 2017. Data from Institute for Health Metrics and Evaluation 2019.⁷

Factors for Mental Wellbeing

There are a number of different factors explaining the development of mental health problems and the opposite, mental wellbeing. Some of these explaining factors are genetic and thus hard to change. Other explanations can be the result of a life situation which pose a difficult challenge to mental wellbeing. This could be issues like chronic disease, economic vulnerability, or having a close family member struggling with addiction. These types of challenges can also be very difficult, or even impossible, for the individual to change themselves. However, there is also a wide range of basic needs and functions for mental wellbeing which are possible for all individuals to alter. In the section below we will look at some of the most important lifestyle factors which have a well established impact on our wellbeing.

Sleep

During sleep, many of the body's and the brain's maintenance processes occur including restoration, memory storage, as well as growth processes and processes which help our immune system. Sleep deprivation is connected to emotional vulnerability and attention difficulties after just one night, and in the long term an increased risk of anxiety issues, depression and suicidal thoughts.^{8,9,10} These are the World Health Organization's (WHO) recommended hours of sleep based on age.

- **1–3 years old:** 12–13 hours per day
- **3–6 years old:** 11–12 hours per day
- **6–12 years old:** 10–11 hours per day
- **12 years old and up:** 8–9 hours per day, though some children need more sleep during puberty
- **Adults:** 7–9 hours per day

Exercise

Daily exercise has been shown to prevent depression, anxiety as well as working as an effective stress inhibitor.¹¹ This can be explained in how exercise sets off several of the body's

processes that are beneficial both for our physical health and our mental wellbeing.¹² Physical activity leads to the release of substances linked to wellbeing into our bodies. One such example is endorphins, which is often described as the body's own opium since it has effects which makes us calm, satisfied and less sensitive to pain. Exercise also has positive effects on our immune system, the brain's plasticity and our stress levels, through its regulating effect on the stress hormone Cortisol. All things taken into account, exercise has a strong positive effect on how we feel and a lack of exercise play part in explaining some of the major health issues of our age, like Cardiovascular diseases and Diabetes type 2. These are the World Health Organization's (WHO) recommendations for exercise based on age.

- **0–5 years old:** Exercise should be encouraged and facilitated
- **6–17 years old:** 1 hour per day
- **Adults:** 2.5 hours per week

A Sense of Belonging

To feel that one is important in other people's lives is crucial for mental health. The opposite – perceived loneliness – has a strong connection to both poor physical and mental health.¹³ A lack of social belonging even increases the risk of dying prematurely.¹⁴ Feeling alone during childhood is connected to an increased risk of developing depression and suicidal thoughts¹⁵ and should thus be taken seriously.

Meaningful Activities

Regularly participating in activities which make us feel good seem to help us build a buffer against feeling low. Studies into activities like singing in a choir, playing sports, dancing, playing an instrument, doing volunteer work, being in book clubs, and so on, show that there is a strong connection between wellbeing and spending more time doing activities which we perceive as self-developing, joyful and meaningful.¹¹

Mental Presence

There seems to be a link between being able to regularly and daily having time for mental recovery and being able to gain perspective, build resilience and self-reflection. Finding a way of being mentally present (for example through mindfulness or meditation) has also been identified as crucial for relieving stress related symptoms, exhaustion, anxiety and depression.^{12,16} It has also been shown that mindfulness training for parents reduces both their own stress levels, as well as showing positive effects on their children.¹⁷

Academic Achievement

Doing well in school appears to be one of the most important factors as a prevention against mental health problems. Studies into the connection between grades and future mental health problems show that the subjects who had the lowest grades in the Swedish school year 9 were at a substantially increased risk of mental health problems at age 30 compared to those with the highest academic achievement, regardless of socioeconomic factors or gender.¹⁸

In conclusion it is clear that there are a number of lifestyle factors that impact wellbeing. Some of these factors have gone through dramatic changes over the past few years. For instance, there is an increased lack of sleep among 11–15 year old compared to 30 years ago, and today all studied age groups sleep for fewer hours per night and go to bed later than previous generations.¹⁹ Sedentary behaviour has increased steadily and the physical fitness has declined substantially in all age groups since the 1990's.²⁰ From 2000 to 2017 there has been a 24 percent decrease in physical activity for 14-year-old girls, and for boys the same age, it was observed to be 30 percent, something scientists speculatively ascribe to increased screen time.²¹

Digital Media Use and Mental Health Problems

Since digital platforms have become a more and more prominent feature in modern day life, new and important questions have been raised as to how the psychological wellbeing of



If you get that symbol that shows you that your best friend on SnapChat is also someone else's best friend, it feels like crap.

young people is affected by different types of digital activities. The public discourse has had a tendency to revert to alarmism and highlighting the most polarized interpretations. In a number of studies, Professor Jean Twenge has shown the connection between digital media activities and altered behaviour across generations, concluding that young people's deteriorating mental health most likely can be partly explained by their increased time spent with digital media.

Other scientists come to completely different conclusions. Professor Andrew Przybylski and his colleagues have studied the connection between screen time and feeling low and they have reached the conclusion that the correlation is so weak that eating potatoes has a bigger impact.²³ This disparity in results depending on the study is partly the result of how data is analyzed, which other factors that have been measured, and how reliable the data is.

The studies mentioned above have only measured digital usage and wellbeing at one single point in time and based on

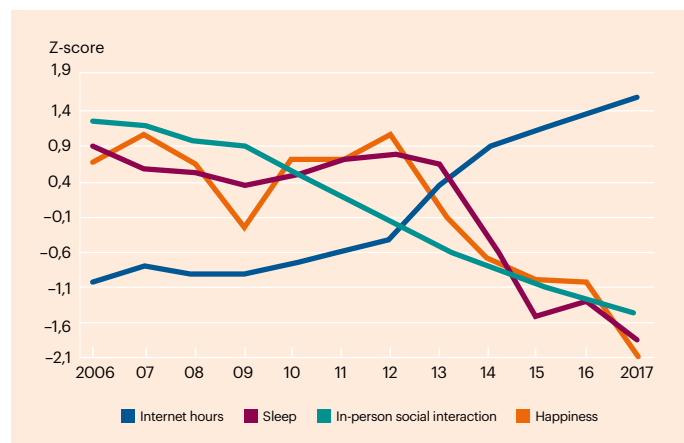


Figure 4 The chart shows self-reported data, in the form of a standardised Z-score, on time spent online, sleeping, in-person social interaction and self-perceived happiness for 8th and 10th graders between 2006 and 2017 in USA. Figure from World Happiness report, 2019.²²

that reviewed any potential correlations. This is often done in the early days of a new research field as a way to explore whether or not it is worth doing further research into the field. In other words, the graph above can not be used to understand whether increased digital usage explains the decrease in self-perceived happiness, physical activity or sleep – the graph only shows that they correlate in time. By now, more or less the whole scientific community has agreed that this is a field worth researching, and despite the short time since the first smartphone was launched, more studies of higher methodological quality are now being published.

Experimental studies provide more reliable results and there have been a few such published with adult subjects. One randomized, controlled study on adults showed that after three months of using a smartphone, including social media, the smartphone users showed elevated levels of social anxiety compared to the control group.²⁴ In studies where consenting participants were randomly selected to either quit using social media or continue as usual, the group who stopped/took a break showed small positive effects on self-reported increased wellbeing.^{25,26} Whether or not these findings can be generalised to children and young people is today not known which highlights the purpose of this report. However, from neuroscience we do know that the brain is at its most plastic and adaptable stage during childhood and adolescence, which means that any substantial amount of time spent during virtually anything has an impact on the brain and its further development. Thus, research into these age groups should be prioritized in the future.

In their report, *Why has mental health issues increased in children and young people?*, the Public Health Agency of Sweden concludes that the current scientific literature is limited and insufficient to draw clear conclusions about digital media usage and trends in wellbeing.²⁷ Despite the limitations, it is a rapidly growing field of research and from Mind's perspective there is a clear need to summarize this research and make it available to more people.

Purpose and Problem Statements

With the world changing, and digitalisation spreading at an increasingly faster pace, there is a great need to increase the speed at which we both acquire and apply knowledge to ensure that we innovate in a way that supports and benefits human needs and wellbeing.

Children and youth are especially vulnerable groups and are for a number of reasons the focus of this report. Firstly, because there is a demand for more knowledge from parents, schools, policy makers and other actors involved in securing young people's development and wellbeing, all of which have a great responsibility. This responsibility is further clarified by The United Nations Convention on the Rights of the Child (UNCRC) becoming law in Sweden in the year 2020. The same steps are being explored in Denmark. In Norway and Finland, the UNCRC has been law for a long time and in these countries it has the highest authority when it comes into conflict with other laws. Among other things the UNCRC states that: "In all actions concerning children [...] the best interests of the child shall be a primary consideration." which also includes digital media usage. How to define what is in the best interest of the child, who is responsible, and how to also enable a children's right to a digital life (which is also a part of the UNCRC) is likely both complex, difficult to assess and implement, based on the current state of research, as well as each child's specific situation. To this end, this report could possibly provide perspectives of the issue.

Secondly, there are many pervasive misconceptions and simplifications regarding these issues, which are likely to do more harm than good unless they are replaced by a more nuanced understanding.

Thirdly, today's digital tools and services, as well as the areas for using them are in constant change and we have the opportunity to influence and improve the technology of tomorrow. In other words, this report can have several functions relevant to our society.

The purpose of this report is to provide a cohesive overview of the current state of research investigating whether young people's mental wellbeing is affected by using digital media and based on this overview provide recommendations for steps which can help promote young people's mental wellbeing in relation to digital technology. The aim is to define what characterises a digital usage which promotes mental wellbeing among young people, age 0 to 18, in Nordic countries.

This research review addresses at the following questions:

1. How is digital media in general, and social media and gaming specifically, used among young people?
2. In what way is there a connection between digital media usage and wellbeing?
 - a. Is there a connection between time spent on digital media and wellbeing?
 - b. Is there any support for crowd-out effects of digital media usage on other important factors (so called indirect effects) affecting wellbeing?
 - c. Are there any underlying factors of importance partially explaining these connections?
3. How do the specific digital activities (social media and gaming) affect young people's mental wellbeing (so called direct effects)?
 - a. Do certain aspects of digital usage play a more important role?
 - b. Are there any underlying factors of importance partially explaining these connections?
4. What measures should invested parties (legal guardians, young people themselves, policy makers and tech developers) take to promote young people's mental wellbeing in relation to their use of digital media?



Anonymous online bullying is worse, since it can be anyone who's written it. There's no one to confront. There's no one to blame besides yourself.

The reason for focusing this research review on social media and gaming is that these are the activities which have been most studied to date.

Target Audience

The target audience for this report is primarily organisations and persons with a specific responsibility to promote a healthy digital usage among young people (age 0–18) in the Nordic countries. This includes legal guardians, professions working with young people (for example, schools and health care providers), policy makers and tech developers. Secondly, this report is directed to young people and others who are interested to learn more about how digital usage has an effect on young people's mental wellbeing.

Since these questions pertain to most people in society in one way or another, it is worth reminding that science reaches conclusions based on patterns on a group level. This means that the conclusions presented here relate to the average of a group and it is completely reasonable that some conclusions are not applicable to you, your experiences or the experiences other young people near you seem to have. There will be examples which seem to be in direct contradiction to the report's main findings, as well as examples where an effect in real life is stronger than the average reported in research. The recommendations at the end of this report are thus written based on how policies and guidelines can be constructed on a group level. However, it is important that anyone who wants to use these recommendations when making decisions or taking actions which concern a child or teenager adapt them with the specific individual in mind.

Methodology

The material for this research review consists of published scientific studies pertaining to one of the questions above. The literature searches included studies published over the last ten years and were made up until October 2019. Studies included in this review were on children and youth aged 0–18, review studies (studies which combine data from several different

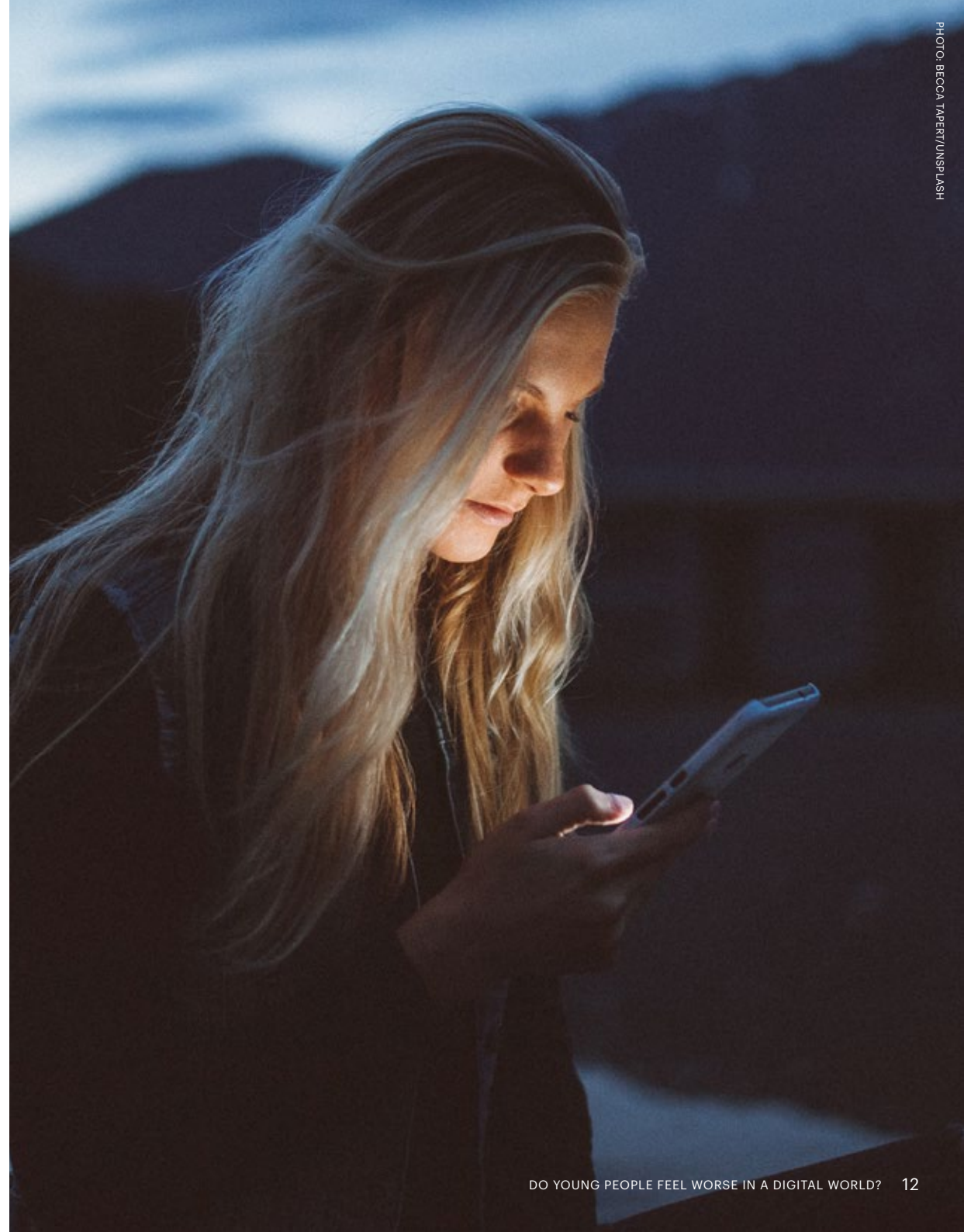


PHOTO: BECCA TAPERT/UNSP/LASH

studies) and studies with the possibility to draw conclusions of the direction of the effects, i.e. studies with an experimental method or studies which have assessed the participants over time. In cases where the before mentioned age span has limited the inclusion of studies, we have chosen to include studies which at least partially covers the age span and uses the above mentioned method. While the generalizability of these findings to younger ages is unknown, they may inform of relevant phenomena worthy of further study. When it comes to underlying factors or potential explanations of the report's main findings, studies which are not limited by the above mentioned methodology have also been included. To verify the reports scientific quality, a group of experts were involved in the project. The group of experts included representatives from several academic disciplines (Psychology, Neuroscience, Interaction Design, Pedagogy, Epidemiology, Law and Criminology, Media and Communication Science) and contributed with both scientific literature as quality control as the report took shape.

Challenges with the Current State of Research

When technological development and dissemination of digital activities occur at a rapid pace, a number of challenges arise as to how they can be evaluated for several reasons.

Firstly, because the field of research is new, few studies exist at all and, by the nature of the field being new, the studies can not include long term effects since these have not been able to occur yet. Secondly, in most cases the tools which have been used to measure, for example, time spent on digital media, have been in the form of self-report questionnaires, a method which has been shown to have a relatively low consistency with actual usage, which leads to a lack of reliability for measuring over time.²⁸ Thirdly, there is always a delay between when research is published and when the data was collected. On average, research published today will be using data collected two years ago. In a high-speed, sometimes exponentially changing, market of technology, this can lead to research being almost obsolete

even before it is published. Examples of such changes can include the users switching platform, algorithms which decides content may have changed, or a change in the users behaviour.

Fourthly, many of the studies which have been published study the participants feelings and usage of digital media at one single point in time, so called cross-sectional studies. From such studies it would be possible to conclude, for example, that there is a correlation between time spent on social media and feeling low. These studies can be a good starting point to explore whether there are any correlations worth studying further at all, but they do not inform of the direction of the effects. In other words, these studies can not inform on whether spending a lot of time on social media leads to feeling increasingly low, or if people feeling low tend to spend more time on social media. It is also not possible to determine the magnitude of the potential effect.

To be able to draw such conclusions, users need to be studied over time, measuring the mental state at several different occasions, thus being able to track any changes (longitudinal studies).

These studies also need to track other aspects of wellbeing, like a sedentary lifestyle, sleep, or major changes in other parts of the participants lives. Such factors are generally difficult to track and even if these studies can give information on possible causal relations, there is always a risk of not having been able to control or eliminate any alternative explanation. If there are associations which seem to be linked to dosage (for example, the more time spent on social media, the more participants feel low) this gives further support to possibly suggest causality. However, even then there may be other alternative explanations for example if a third and not measured variable also happens to vary in a dose related way. This could be the case if the dose-related relation between time spent on social media and wellbeing was in fact mostly explained by a corresponding reduced time spent on sleep. Some studies will have researched both factors (sleep and social media usage), others will not.

To be completely sure that what is being studied is the cause of a certain effect, studies should be constructed in a way so that the only thing that differs between the groups studied is the potential cause (in this example, use of social media.) The most reliable method to study causal relations is through *randomized, controlled trials*. Participants who have not yet been exposed to the activity or drug you want to study (in this example social media) are recruited and assessed for wellbeing. Next it is randomly decided which of the participants who will take part in the activity of interest and which that will be part of a control condition. The participants are then followed over time and their mental wellbeing measured at the end of the study. If the group which has used social media shows a less positive change in their mental state on average, compared to the group which has not used social media (the control group), the researcher can be confident in concluding it was this particular activity which caused the change.

This leads us to the biggest challenge in this field of research – there are no control groups left! When the average age to get one’s own first smartphone is 9 years old and 98 percent of all 12-year-olds uses Snapchat, it is impossible to find participants who are not involved in the activities (and that are representative of the norm). The alternative would be to use even younger participants, which is not possible due to ethical considerations, or to study users in countries where the technological development has not gone as fast. However, the possibility for general conclusions from such studies would be limited since there are so many other differences compared to the way we live in the west. The remaining possibility is to randomly select participants who stop doing the activity for a period of time. This can give an overall indication as to the effect, but it can not show the effect of starting to do the activity. To conclude, these problem statements are very difficult to study. To be able to provide support for sound digital habits for the young people of today, it is necessary to not only rely on existing research in the specific field, but to include knowledge and findings from other fields as well.

Given these challenges, this report focuses on meta-analyses to evaluate general correlations between digital media use and wellbeing, as well as experimental and longitudinal studies for the specific activities of social media use and gaming.

Definitions

In the introduction of this report, the term mental health problems was clearly defined. Our approach has been to understand correlations between digital media and our general mental state, not whether it makes us unwell or not. One exception lies in the evaluation of gaming disorder, something which is now classified as a clinical addiction to gaming. In the literature search, the term “wellbeing” (“välbefinnande”) has been used to find relevant studies. In the studies found through the literature search, wellbeing has been measured in various ways, primarily through self-report questionnaires were the young participant has responded to questions about how they feel. Sometimes, this has included questions about feeling low, depression and sometimes, wellbeing has been defined as “the absence of depression”. In other words, there are different measures of results depending on the study. Overall, however, the participants in the included studies have not been clinically diagnosed patients, but instead participants have been recruited based on other criteria (primarily age).

Digital Media Use

Just like analog media use, digital media use includes a number of different activities which can be developing, entertaining, inspiring or harmful. Depending on other aspects of one’s life the extent of use can be too little, just enough or too extensive. Digital media use can be anything from chatting with a friend, streaming video, creating movie clips, doing homework, looking at the weather forecast, gaming, doing online bank errands or sending threatening messages. The term digital media use includes a number of different things. Each of these activities most likely has a different effect depending on how much we



In secondary school, you asked yourself questions if no one else did. Just as a way to get some affirmation – even negative attention is better than nothing at all. Later you realize it wasn’t that fun.

Said about anonymous questions in social media apps

do them, who we are and what we do with the rest of our time. There are thus a number of parameters to take into account to adequately study these activities and we attempt to outline some of these based on the findings reviewed. In this research review we refer to digital media use as assessed with the (mostly self-reported) questionnaires used in the studies included. To map young people's digital media use we have used the definition put forth by the Swedish Media Council. This includes media use on the participants free time using digital tools, for example like when a child streams movie clips, uses social media or is gaming.

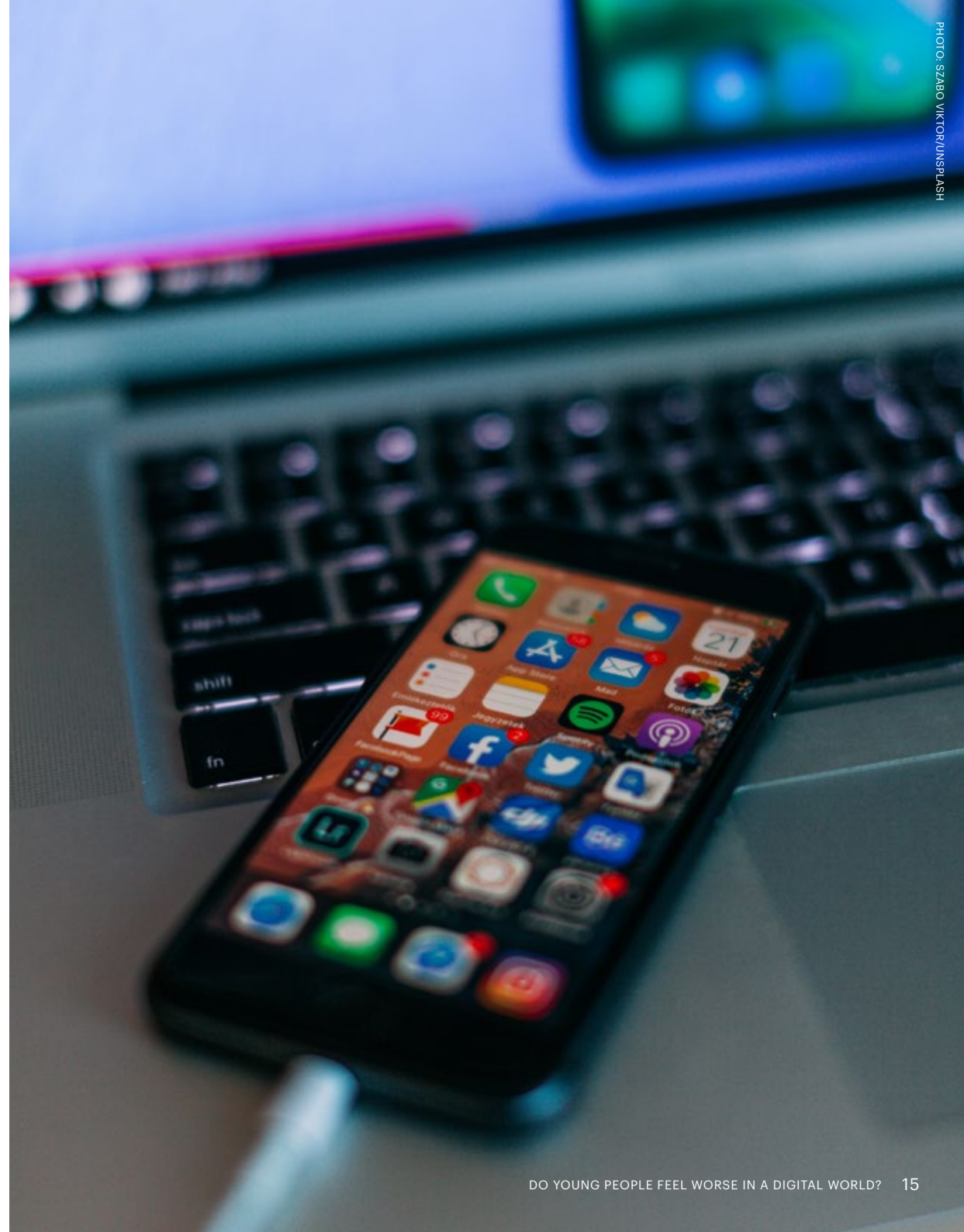
Time

A common term used in the current discourse of digital media use is “screen time”. There is so far no definition on the term agreed upon by the scientific community.²⁹ In this report, screen time is defined as the time spent with different screens, TV, computers, tablets and smartphones, on one's free time.

The impact of screen time is likely different depending on what content that screen time is filled with, and the impact of doing an hour of either: schoolwork, video chat, or posting hateful comments on social media, is likely very different. The different studies in this report have included a variety of digital media use which will be highlighted to the extent the original study makes this clear. Social media use and gaming has been reviewed separately due to the prevalence of these activities among young people, as well as these activities having been studied more in depth so far (compared to, for example, streaming).

Social Media

The comparison of social media between different studies is made complicated by different studies having different definitions of social media. In this report, social media is defined as websites or apps which enables users to interact in social networks and to contribute user generated content. Examples of social media are Instagram, Snapchat, Twitter and Facebook. Platforms which are only chat based, like WhatsApp and Facebook Messenger, are



often included in the definition, as are streaming sites where user interactions are possible and common, like YouTube, TikTok and Twitch. Combined, this makes social media a broad term where one user might use it to chat with friends and someone else uses social media to watch movie clips.

Gaming

Gaming can be defined as interactive games which are played using, for example, a smartphone, a computer or a gaming console. Generally there is no distinction between what kind of game it is (genre), if they are played online or offline, and if the games are played individually or together with others (single-player/multiplayer games). Examples of genres include puzzle video games (Candy Crush, Tetris), simulation video game (The Sims, FIFA), action games (Counterstrike, Grand Theft Auto) role-playing video game (Fortnite, Minecraft, League of Legends), exergames (Wii Fit, Dance Dance Revolution) and educational video games. New genres are on the rise, for example augmented reality games (Pokémon Go).

Underlying Factors

Many behaviours and events that occur on digital platforms are mirrored in the analog world, and there are often underlying factors explaining an occurrence regardless of where it happens.³⁰ If mental health problems already exist, it is likely that using, for example, social media either exacerbates or alleviates the symptoms of this mental state, compared to a person who does not have mental health problems. In other words, the effect would be different depending on each person's prior condition. There are a number of possible different ways in which digital media use could have an effect on the mental wellbeing of young people (and adults).

Indirect Effects

An indirect effect is when digital media use has an impact on wellbeing via its effect on other factors.^{31–33} It could be that an

increased use of digital media crowds out other activities which have beneficial effects on mental wellbeing, for example staying up late and thus sleeping less. Other protective factors for wellbeing which could be crowded out includes exercise, socializing with other people, or spending enough time and effort on school work. Conversely, increased digital media usage can also replace and crowd out problematic behaviours and thus have *indirect* positive consequences. Examples of such behaviours could be isolation, arguing with other family members, drug use or fighting. When analyzing this theoretical explanatory model the total time spent on these activities as well as other aspects of life need to be taken into account. It is possible that there are more clear effects for certain groups depending on underlying factors here as well. For example, the impact of social media use will have different effects for a person with high energy levels or hyperactivity who's usage leads to becoming more sedentary, compared to someone who has a naturally lower need for physical movement. Another possible outcome could be that someone in a vulnerable socioeconomic state has a stronger positive effect than the average, as digital media use can be a way to do less destructive things with their time.

Direct Effects

A direct effect is when the specific digital activity has an effect on mental wellbeing.^{34,35} Examples of activities which could lead to negative consequences include unrealistic beauty ideals on social media, online hate speech, radicalization, desensitization for violence or online bullying. However, it could also be things with a positive impact on mental wellbeing, such as getting in contact with likeminded people or getting your opinion heard. The type of content combined with underlying factors could also have an effect. For example, a person with an eating disorder who has their social media feed filled with content focused on looks, could likely experience a greater impact than someone without an eating disorder who has the same social media feed. Conversely, someone who has trouble finding



I guess my “screen addiction” is pretty normal, but my sister is 13 and she follows all the influencers and has a really hard time putting away her phone and she gets very affected. She doesn't know that much about life outside the Internet, so that sort of becomes everything to her...

like minded people in the physical world could get a sense of belonging in a digital context – something which is likely to have a greater positive effect on their mental state than for those groups who already have this sense of belonging “offline”.

In other words, usage of digital media is complex and likely linked to the below listed factors:

- underlying factors
- the proportion of our time spent on digital media
- the content we experience during that time
- other lifestyle conditions

As everyone who uses digital media knows, the content changes from day to day, or even from one minute to the next, and is usually not exclusively negative or positive. Figure 5 shows the ways different factors and digital media usage might have an effect on mental wellbeing.

The next section reports findings from studies on general use of digital media, i.e. studies which explore associations with wellbeing from any indirect effects. Effects from the specific activities social media and gaming are then reported in their own sections.

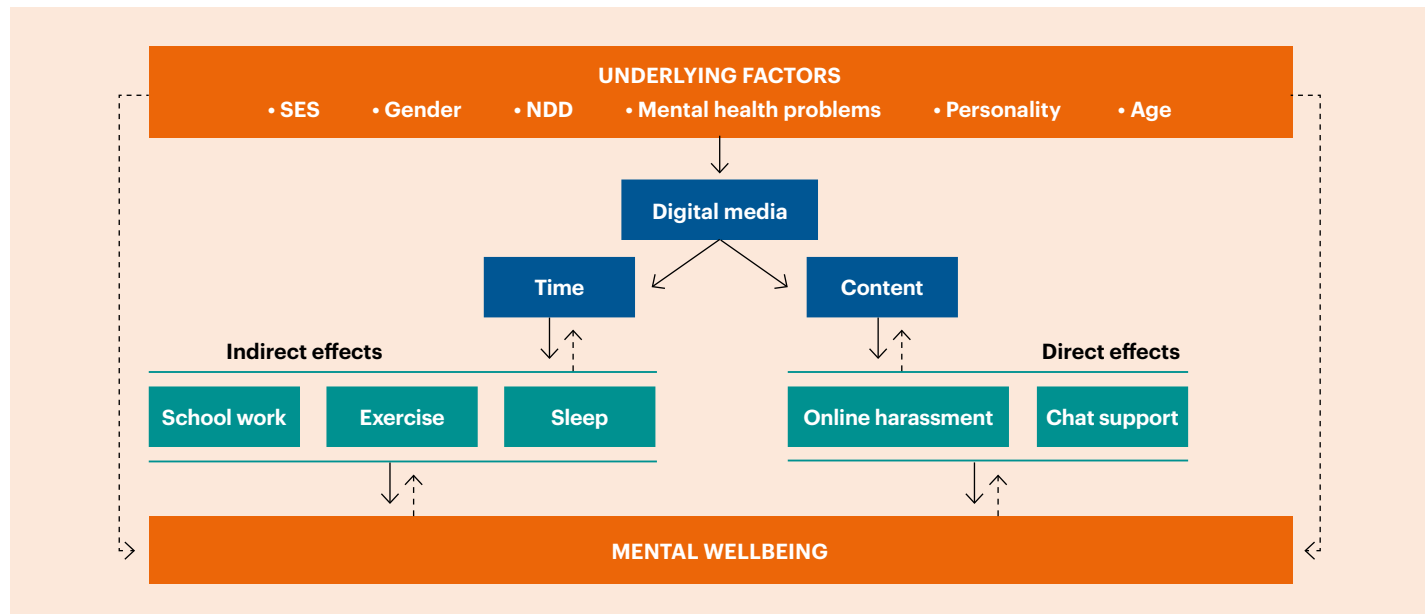


Figure 5 Theoretical model for how different types of digital media use could have an effect on mental wellbeing. Depending on multiple different underlying factors, such as socioeconomic status (SES), neurodevelopmental disorders (NDD), gender, personality etc the use of digital media could have an impact on our mental wellbeing, either as a direct effect based on content (social media, YouTube etc) or through indirect effects such as crowd-out effects. Crowd-out effects happens when the time spent on digital media affects the time spent on other activities which have an effect on mental wellbeing, such as sleep, and thus has an indirect effect on wellbeing. In turn, these effects could have an impact on how we consume digital media (both in time spent and type of content), which is represented by the dotted lines in the figure to show the effect can go in both directions. As an example, someone who is depressed could be drawn to digital media with negative as well as spending more time on digital media and thus exacerbate their negative emotions.

2. Results

Digital Media

Statistics on Young People's Use of Digital Media

Sweden

Today it is common that use of digital media begins at an early stage in life with more and more children using the Internet for several hours per day. Studies show that the proportion of infants (children less than one year) who use the Internet has increased steadily, from six percent in 2016 to 15 percent in 2018.³⁶ This use revolves primarily around watching video clips or other moving images, but 14 percent of infants also play games on smartphones daily. Four out of five two-year-olds use the Internet, which is the same level four-year-olds used the Internet in 2015. From the age of two, apps becomes part of the daily activities with 11 percent gaming more than one hour per day, and 40 percent gaming less than an hour per day. The

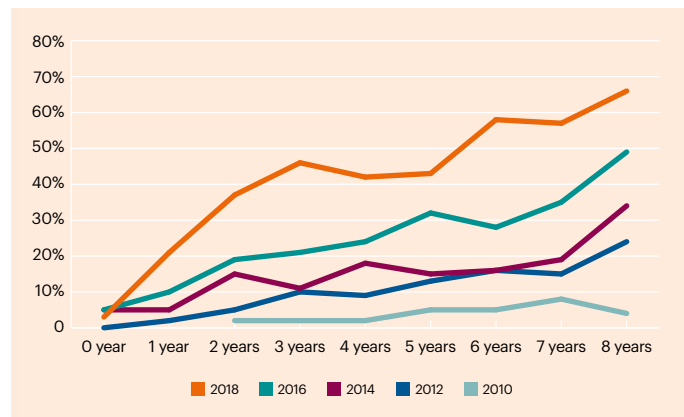


Figure 6 Change of proportion of children age zero to eight who uses the Internet daily over the span from 2010 through 2018. Graph from Småungar & medier, 2019.³⁶

proportion of 2–4 year-olds who uses the Internet more than one hour per day has increased from 15 percent in 2012 to 43 percent in 2018. In children between the ages five and eight, the current use of the Internet is almost twice that of 2016. From 36 percent using the Internet more than one hour per day in 2016 to 63 percent today. And the proportion of users that spent more than three hours per day has tripled.

One out of five of children age five to eight has their own smartphone, and the average age for getting their first own smartphone is nine.^{3,36} From the age of 12, the average boy starts to actively seek out online porn, but many have been unintentionally exposed to online porn at an earlier age.^{3,37} It is now common place that the first exposure happens through pop-up ads, adverts in gaming apps, “porn bots” or that friends show each other on their smartphones or digital tools in school. From the age of 13, the amount of time spent on social media

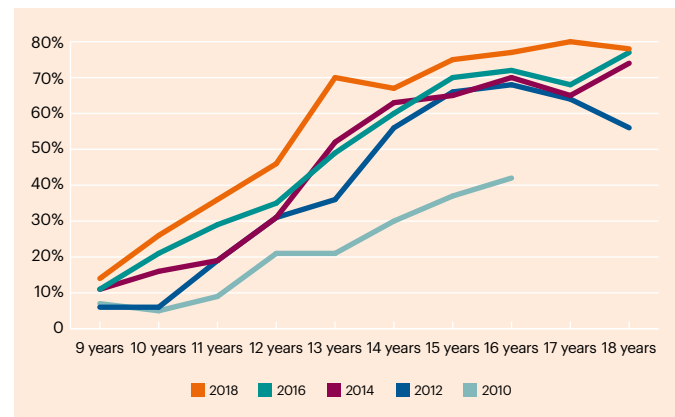


Figure 7 Change in the group 9–18 who uses the Internet more than 3 hours/day spanning 2010 through 2018. Graph from Ungar & medier, 2019.³

and gaming increase substantially, and from age 14, the average girl also started to search for online porn.^{3,37}

The time spent on digital media is also the cause of conflicts in many families with more than half of the parents to children ages 9–18 feeling they lack guidelines, or are unsure about what the guidelines are, for digital media use.³ One out of four children ages 9–12 feel that they spend too much time on YouTube, and the share of young people displeased with the amount of time they spend on digital media increased with age. It is worth noting that more than half of young people ages 9–18 think that their digital media use crowd out other things they should have spent time on, such as exercise, sleep and reading. 73 percent of 17–18 year-olds feel that this happens every week. Among teenagers, a third or more (even more common with girls) feel that their sleep is negatively affected by their digital media use. An opinion shared by their parents.

Underlying Factors and Digital Media Use

There are underlying factors that are differently linked to the way digital media is used which can pose an increased risk or alternatively, greater benefits than for others. One example is children with neurodevelopmental disorders which in general both have greater access to, and spend more time on digital media compared to their peers.^{38,3} The type of digital activities also differs between certain underlying factors, with differences between the sexes starting at the age of five with boys using gaming apps to a larger extent than girls.³⁶ From age 13, girls spend more time than boys on social media, whereas boys spend more time gaming. The type of use also differs throughout children’s development. Generally it goes from passive consumption (watching TV/videos) at younger ages to increasingly more interactive or productive forms with increasing age.

Digital Media and Mental Wellbeing

The following paragraphs summarize findings from compilations of cross-sectional studies which have studied the connection between general use of digital media and young people’s wellbeing (in the form of meta-analyses). Conclusions regarding causal directions can not be drawn based on these studies. Furthermore, these studies do not consider which specific content the time has been spent on, but simply assess the amount of time spent and the levels of wellbeing. A few studies assessing participants media usage over time will also be summarized below.

In what way is there a connection between digital media usage and wellbeing?

The main findings from published meta-analyses show evidence of a strong negative correlation between digital media use and wellbeing, quality of life, and strong correlation for symptoms of depression among young people.^{39,40} There is also moderate support for a correlation with other aspects such as self-esteem (negative), sleep problems, anxiety, attention deficits, hyperactivity and behavioural issues.^{40,41} This means that it is more common to report decreased mental wellbeing when spending more time on digital media.

When studying the effects of different activities, treatments or pharmacological substances, it is often expected that the amount of something (dosage) should correspond with the effect it has on whatever it is you want to affect (pain, symptoms, learning etc) which is called “response”. It may seem strange to apply this logic for digital media and wellbeing considering the complexities of the content and the person interacting with that content. Digital media is thus not an isolated active ingredient to be given in a specific dosage. However, the effect can still follow a similar pattern between dosage and its response, for example, crowd-out effects: that is time being spent on digital



There have been times when I deleted Insta, and I do alright, but you still feel sort of left out when everyone is talking like “Did you see this?” or like “What’s your username on Insta?”.

media use instead of activities which have a more positive impact on wellbeing such as sleep.

There are reported linear associations between time spent on digital media and the result of different aspects of children's attainments (for example, likeliness to do their homework, to stay focused during challenges, finishing started activities or projects) where an increased use of digital media was associated with worse results in all measures.⁴² It is worth noting that the smallest unit of time categorized was 0–2 hours per day, which means that all who had a digital media use less than two hours per day were bundled together.

One meta-analysis covering studies which categorized time with greater accuracy reported a (non-linear) dose-response relation between digital media use and symptoms of depression.⁴³ These findings showed that the risk for depression syndromes increased with digital media use exceeding two hours

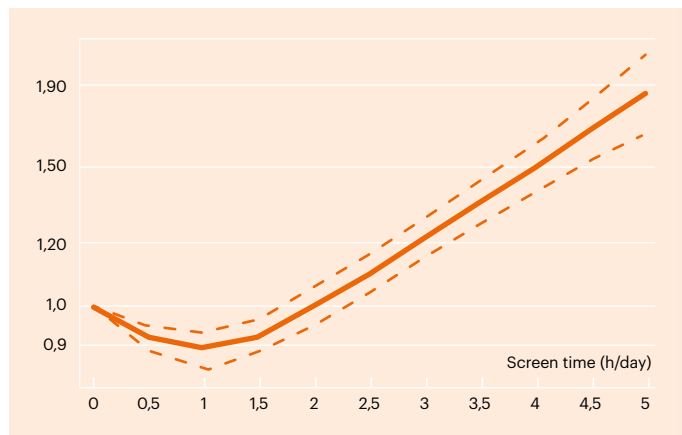


Figure 8 The graph shows the correlation between risk (odds ratio) for depression (Y) in relation to no screen time (OR=1) and the average amount of time per day spent on digital media (X axis). The dotted line represents the 95% confidence interval for the final statistical model. Figure from Liu et al, 2016.⁴³

per day, but that those who spent an average of approximately one hour per day showed a lower risk of depression compared to participants who spent no time on digital media at all (see figure 8). Compared to those who did not use digital media, the participants who spent between 30 and 90 minutes per day had a reduced risk of depression with circa ten percent. Participants who spent more than two hours per day had an increased risk of depression by 8, 19, 46 and 80 percent respectively for 2,5 hours, 3, 4 and 5 hours, compared to those who spent no time on digital media. The study was however not able to assess cause and effect, but simply observed a correlation between the extent of depression symptoms and the amount of time spent on digital media.

In summary, several studies have shown a correlation between digital media use and decreased wellbeing, but the causal relations are still uncertain.

Indirect Effects

In the following two sections we try to answer the question; is there support for crowd-out effects on important factors for wellbeing caused by digital media use (so called indirect effects)? We have divided these into negative and positive indirect effect. The direct effects (which are caused by the content of an activity) are described in the sections for social media and gaming respectively.

Negative Indirect Effects

The following sections summarizes studies which support theory in which digital media use crowds out health beneficial activities such as sleep, exercise, or hanging out together (see the background covering the connections between each respective activity and wellbeing).

■ **Sedentary Lifestyle.** Meta-analysis which have compiled results from cross-sectional studies show a clear negative association between time spent on digital media and being sedentary^{39,41,44,45} which could lead to missing out on the positive effects that exercise has for wellbeing. Furthermore, studies assessing long term effects of sedentary screen time (watching TV and gaming specifically) also report a negative link between screen time and mental wellbeing for children over time.⁴⁶ For younger children (aged 6), the amount of sedentary screen time predicted the development of emotional problems two years later. For slightly older children (aged 10), sedentary screen time predicted problems with hyperactivity and behavioural problems. For slightly older children ages 12-16, one longitudinal study on digital media use did not find sedentary lifestyle to be a significant factor explaining the increasing levels of feeling low observed over time.⁴⁷

■ **Problems with Sleep.** There are clear negative correlations between time spent on digital media and sleep⁴⁸. One longitudinal study of the connection between the use of social media and symptoms of depression among young people showed that much of the effect was explained by the lack of sleep⁴⁹. We will look at this study more in the section on social media

Using digital media in the evening seems to have a particularly negative effect on sleep. A meta-analysis reviewing the effects of digital media use specifically in the evening showed a clear link to fewer hours of sleep, less sleep quality and more tiredness during the day⁵⁰. This connection is also valid for children who had their smartphones in their bedrooms during the night, even though they were not using it. Exercise, positive family relationships and pre-decided bedtimes have been shown to have a positive effect on sleep, whereas screen time in the evenings, tobacco and negative

family relationships seem to have a negative impact on sleep.⁵¹

■ **Hanging Out.** Much of the social interactions which used to take place in the physical world or in real time now happen digitally, with youth reportedly preferring to text and chat instead of, for example, calling.⁵² Also, youths who have grown up with digital technology seems to socialize in the physical space one hour less than previous generations (though this does not have to be a result of technology).⁵³ Similar patterns can be seen for physical social interactions in Sweden when viewed over time.⁵⁴ One study of usage over a one year period, found that physical socializing had a protecting effect on wellbeing, but that the effect was equivalent to, or weaker than, the negative effect that social media had on wellbeing.⁵⁵ In two of the experimental studies where adult participants took a break from social media, it was observed that the group which were not on social media began to spend more time socializing compared to the group who continued their use of social media.^{26,56} Equivalent studies with young participants have not been found for this research review.

■ **Academic Achievement.** Doing well in school emerges as one of the factors with special significance as a protection against mental health issues. There is a negative correlation between time spent on digital media during weekdays, but not weekend, and academic achievement.^{57,58} Time spent on digital media has been shown to predict lower academic achievement in longitudinal studies too.⁵⁹ However, the causal relationship is still not clear. It is likely that digital media use is something you start to occupy yourself with when you have already failed at school, rather than it being the primary reason for that failure.⁶⁰



When I sit just scrolling, I get so tired I can't be bothered doing anything else, so I just continue scrolling.

Positive Indirect Effects

Digital media usage could theoretically have positive effects on wellbeing by replacing activities which have harmful effects on wellbeing, such as ruminating or risk behaviour like alcohol consumption. Studies addressing these theoretical pathways have not been identified in the scope of this research review. However, studies exploring alcohol consumption among teenagers over time observe that the proportion of young people who abstain from alcohol has increased since 1988⁵⁴ and from 2003 to 2015 has more than doubled.⁶¹ One explaining factor put forth in these studies was that young people meet less often which could be a result of young people spending more of their weekends with digital activities. However, this is something for future studies to research.

Underlying Factors Important for the Connection between Digital Media Use and Wellbeing

Are there any important underlying factors partially explaining the connections between digital media use and wellbeing?

Neurodevelopmental Disorders

Studies show that children and young people with neurodevelopmental disorders (such as ADHD) on average spend more time sedentary doing digital activities compared to others.^{62,63} This pattern seems to be stronger for older youth, than for younger ages.⁶² It also seems that young people with neurodevelopmental disorders are more often subjected to online harassment than other children.³

Low Socioeconomic Status

There is support showing that children in families with low socioeconomic status, and parents with lower education levels, are particularly vulnerable when it comes to the connection between digital media use and wellbeing.⁴⁶ For example, there

are indications that the connection between screen time and less sleep might be largely explained by contextual factors which leads to both less sleep and more screen time.⁶⁴

Age

The effects of digital media use seem to be different depending on the age of the child. For children under two years, longitudinal studies show a connection between time spent on digital media and delayed language acquisition⁶⁵, social-emotional development^{66,67}, attention deficits and impulse control⁶⁸ one and two years later.

One large study of 2,400 families with children showed that the amount of screen time predicted cognitive development at three and five years old respectively, even when factors such as socioeconomic status, depression symptoms in the mother, sex and how much the parents read aloud to the child were taken into account.⁶⁸ The amount of time watching TV at age two has also been shown to predict the impact of a number of negative aspects on health, including academic achievement, overweight, sedentary lifestyle and unhealthy eating habits.⁶⁹ It is also worth mentioning that there are studies showing that parental use of digital tools in the presence of the child affects the quality of the interaction between parent and child, which in the long term also could affect the child's development.^{70,71} These effects on the young child could possibly be explained by the unique plasticity of the brain during the child's first years, which then decreases. These early years are when the environment has the greatest impact on the brain's development.⁷² It has been shown that infants and toddlers have a selectiveness for social learning with eye contact, mimicking and active interaction with other humans⁷³ which means that time spent on digital media at this stage of development is mostly wasted time. This in turn crowds out other activities, which would be more beneficial for the brain. If this happens to a large extent during the brain's so called

critical or sensitive periods, it becomes much more difficult, or even impossible, to compensate for this lost social learning at a later stage⁷⁴, which could possibly explain the findings mentioned above.

There is also support from studies on slightly older age groups for an increased sensitivity on wellbeing related to younger age. Time spent watching TV and gaming at six years of age compared to ten years of age predicted the development of more emotional problems two years later for the younger group, whereas this was not apparent for the older group (where digital media use instead predicted hyperactivity and acting out).⁴⁶ There is also support that the dose-response relation between time spent on digital media that was previously mentioned is stronger in the younger age groups (under 14).^{11,43} There is also an increased risk of gaming becoming problematic with younger users compared to older users.⁷⁵ Besides the brain's plasticity being different at different ages, part of the explanation could be that crowd-out effects on, for example, exercise could have a stronger negative impact on younger children than older ones, since they have a physiologically greater need for physical movement.

This section covered the effects of time spent on digital media in general and the so called indirect effects. However, the effects are not only influenced by the amount of time spent in front of a screen, but also what the activities on that screen are. The next section explores the effects of social media, followed by gaming.



Social Media

Statistics on Usage Among Young People

Sweden

From 13 years of age, almost all young Swedes use social media, most of them daily. It is slightly more common that girls use social media compared to boys. From 13 years of age, high frequency usage (more than three hours per day) is much more common among girls than boys (figure 9). In comparison to earlier studies, many children in all age groups between 9 and 18 report that they have been harassed online (figure 10) and children with neurodevelopmental disorders are more often subjected to online harassment than children without neurodevelopmental disorders (figure 11).³

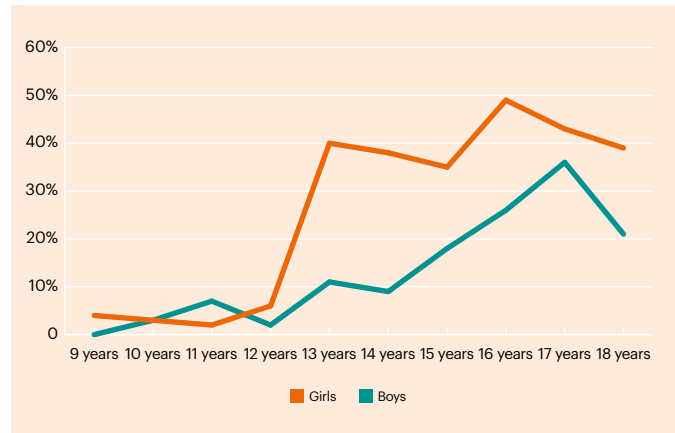


Figure 9 Proportion of young people ages 9 to 18 who spend more than 3h/day on social media. Graph from Ungar & medier, 2019.³



It feels so bad when you suddenly notice you've been sitting for hours without realizing it.

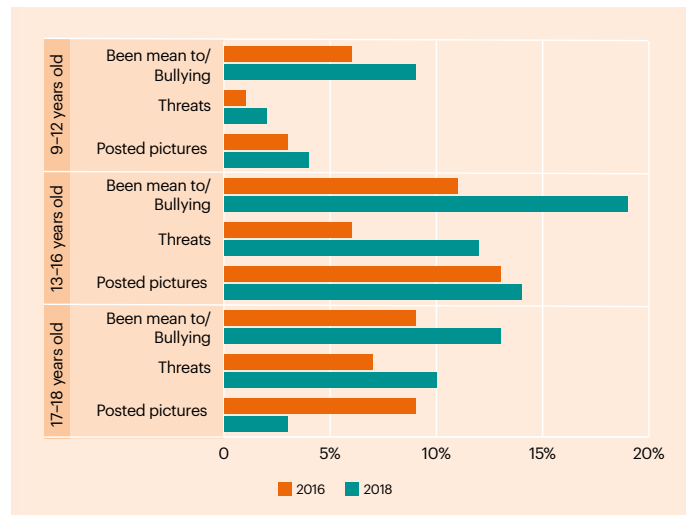


Figure 10 Proportion of young people ages 9 to 18 who report being subjected to online harassment in 2016 and 2018 respectively. Graph from Ungar & medier, 2019.³

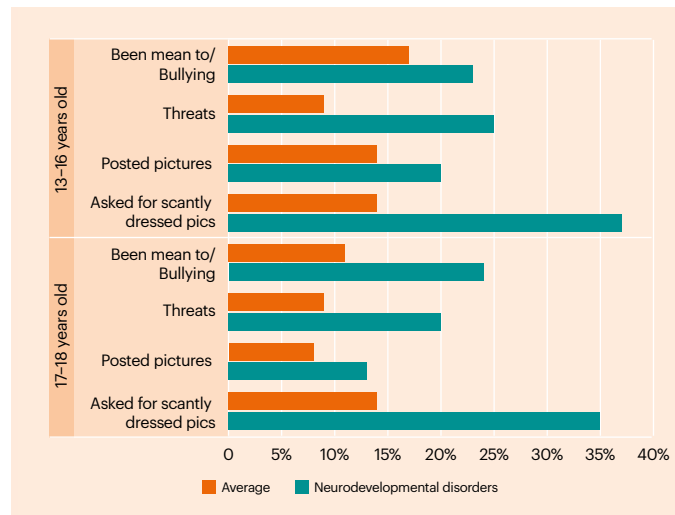


Figure 11 Proportion of young people ages 9 to 18 with and without neurodevelopmental disorders who report being subjected to online harassment. Graph from Ungar & medier, 2019.³

Social Media and Wellbeing

This section covers meta-analyses, studies which have followed the participants over time, and experimental studies. For underlying factors, cross-sectional studies are also included.

How does the use of social media affect young people's mental wellbeing (i.e. direct effects)?

For young people, there are both risks and possibilities associated with the use of social media. Some of the advantages include: an increased social support, increased social capital, improved self-confidence, and a possibility to safely open up and explore new identities. Disadvantages which have been observed are: an increased risk of online bullying, social isolation, depression and being exposed to harmful content.⁷⁶

Time Spent on Social Media

The compilation of published studies generally seems to show a small, negative correlation between social media use and young people's mental wellbeing.^{77,78} Young people who spend a lot of time on social media seem to generally have lower levels of wellbeing than those who spend less time. However, the direction of the effect is not clear: is it social media which leads to less wellbeing or does low sense of wellbeing lead to increased use of social media?

We have not been able to identify any randomized, controlled studies for the studied age groups, neither when it comes to starting, nor quitting social media (see former sections on page 10 on such studies with adult participants which showed a small negative effect on wellbeing). Studies of young people over time show partly contradicting results.

Two studies that followed 6,600 and 3,800 young people respectively, over three and four years, showed that more time spent on social media could predict decreased mental wellbeing over time.^{47,146} One study saw effects that social media seemed to reinforce negative feelings in participants who were already feeling low⁴⁷, whereas the other study found no support for the

effects being different depending on how the participants felt before.¹⁴⁶ Conversely, a study following 500 teenagers over eight years was not able to show that time spent on social media predicted symptoms of depression or anxiety on the individual level.⁷⁹ However, at a group level the connection between time spent on social media and anxiety still remained.

This could be interpreted as the time spent on social media not being a reliable indicator as to whether one single individual is more likely to suffer decreased mental wellbeing, but on a group level, time spent on social media seems to partly predict the groups decreased wellbeing over time. There are a number of other factors which have a greater impact on mental wellbeing than time spent on social media, yet these studies show that it still seems to have some kind of effect. Furthermore, it is likely that not only the time spent on social media, but the content interacted with, plays a part in this connection. Something we will look into in following sections.

One extensive questionnaire study that followed young people over time showed minimal effects on wellbeing, and only on girls.⁸⁰ The study also supported previously mentioned findings that those who are already unhappy with their lives will use social media more and report lower levels of wellbeing over time. One British longitudinal study concluded that, lack of sleep, being sedentary and an increased risk of online harassment completely explained the connection between social media and less wellbeing for girls.⁴⁹ The negative association between social media use and increased levels of anxiety however, still remained significant after taking these factors into account.

The Role of Social Media

It is easy to see the possibilities of social media, and there are indications that these platforms function as extensions of human relational behaviours and motivations in general. Social media primarily fills two social functions: to be in contact with other people and to make an impression on other people. The platforms enable contact where there used to be physical barriers, or

limits to how many it was possible to interact with at a time. The natural need for humans to feel a sense of belonging is partly fulfilled through social media. However, depending on a number of different factors, which we will look into in the following sections, social media also seems to lead to increased pressure of unrealistic ideals, resulting in social comparison and envy.⁸¹

Different Types of Usage

Social media can be used in a variety of ways. There are few studies on different types of social media use among children and young people, but studies of adult social media users show that the mental state of the participants has differed depending on what they did on social media platforms. There is, for example, a difference between passive use (reading posts, clicking on links) and active use (writing comments, chat with friends). Studies show that passive use can lead to decreased wellbeing since it triggers social comparison and envy for the user scrolling through its feed, whereas active use can increase wellbeing as it helps to strengthen social ties and creates a sense of belonging.⁸¹ In a study where the adult participants had to stop using Facebook for one week, the greatest positive effects occurred with passive users who normally spent a lot of time on the platform, and were easily made to feel envy.²⁵ Studies of adult Facebook users show an increased sense of wellbeing connected to personal communication with people the users feel close to (through chat for example), whereas “one click” interactions and impersonal communication did not have a positive effect.⁸² On expansive cross-sectional study of more than 10,000 Icelandic youths, recently reported that active social media use had a neutral correlation to symptoms of depression and anxiety and passive users showed a negative correlation. This was found even when taking into account the amount of time spent on social media and other factors.⁸³ However, this study did not follow the participants over time and thus it cannot be concluded what is cause and effect. The proportion of time spent on social media is individual, but one study showed that

the participants spent an average of 50 percent more time on passive activities.⁸⁴

With young users, it seems that the number of different platforms they are active on makes a difference. One study of 11–14 years old was able to identify several subgroups of low and high frequency users. Among the high frequency users, the study could identify two types of users who spent a similar amount of time on social media with the difference between them being how they divided their time between the different platforms. The subgroup which used several different platforms showed more symptoms of depression and reported panic attacks one year later as well as decreased levels of support from their friends.⁸⁵ The group which only used two platforms (Instagram and Snapchat) did not experience any change in symptoms and an increased support from friends (but were more prone to act out and avoid school). These results match a previous cross-sectional study which identified a correlation between number of platforms, symptoms of anxiety, depression and increased feelings of, so called “fear of missing out” (FOMO).⁸⁶ How time is divided between different platforms seems to be important, yet there is not enough research to explain how, and why, it is important.

Another question is how social media affects body image and being content with one’s own body. There is a correlation between having a self-image of being an “object” for others to judge and posting more self-objectifying selfies on Instagram. This has also been connected to a reinforcing effect – the more likes these types of selfies get, the more such pictures will be posted.⁸⁷ One longitudinal study of Dutch teenagers, showed that participants who used social media more were slightly more dissatisfied with their bodies over time.⁸⁸ In one similar experimental study with girls ages 14 to 18, the participants were randomly shown selected manipulated photos from Instagram, as well as original photos, of female bodies and then had to answer questions about self-image and compare themselves to the images viewed. The participants were told that the aim of



The bully think they have a whole army on their side, but really everyone thinks they’re a f***ing clown, but still no one says anything.

the study was about facial expressions, rather than body image. The results showed that the participants who looked at the manipulated photos reported more dissatisfaction with their own bodies than the participants who had looked at the undoctored, original photos. The effect was strongest with participants who were more inclined to compare themselves to others.⁸⁹ In general it seems like there is an effect on both the person who publishes these kind of photos through the feedback received (for example, number of likes), and the person who looks at the posted pictures through comparison with their own body.

The Role of Social Media in Mental Health Conditions

In general, people with several symptoms of anxiety and depression seem to spend more time on social media.⁷⁸ The correlation seems to be largely explained by the fact that high frequency users of social media also sleep less and are more at risk of being subjected to online harassment.⁹⁰ However, the results diverge when looking at the individual, rather than group, level. When individuals have been followed over time, there are indications in some studies that an increased use of social media has led to increased symptoms of depression and anxiety,⁴⁷ where other studies do not show this pattern.⁷⁹

For young people who suffer from mental health problems, social media can have both risks and opportunities.^{91,92} Social media can be used as a way to find support which can contribute to an improved mental state. Social media is also a valuable resource for people with diagnoses that may be stigmatising. They can feel less vulnerable as social media can enable contact with others who share the same experience. Furthermore, social media can make it easier to get in contact with health care or online support forums, or alternatively find information on where to turn to.

Some studies for instance, have focused on the function social media can have for youth and young adults with self-harm problems. In general, the platforms are perceived as supportive and as contributing to a sense of community.⁹³ The support can

take the form of encouragement, advice on how to stop inflicting self-harm and information on where to turn to for help. However, there is a darker side too which includes a normalisation of self-help problems, advice on how to hide the behaviour and discussions justifying reasons to self-harm, or making suicide plans. Social media can thus both help and harm depending on the forum or platform, and what activities take place in that space.

Online Bullying

An increased presence on social media also leads to an increased risk of being subjected to online bullying.⁴⁹ As has been shown previously in this report, besides crowd-out effects on sleep, online bullying is likely one of the primary explanations for high frequency users of social media reporting more symptoms of depression.^{49,90}

Trying to put together a list of common characteristics of both online bullies and victims, it becomes apparent that there are great variations – there does not seem to be a “typical bully” or “typical victim”.⁹⁴ Some factors seem to be more common; online bullies seem to have more difficulties in school, they know their victim and are subject to bullying themselves. It is also more common that bullies are physically aggressive and also bully face-to-face.⁹⁵ The victims of online bullying tend to feel worse than the average and also be subject of face-to-face bullying.⁹⁴ Besides increasing the risk of symptoms of depression, online bullying has been shown to increase the risk of sleep issues, negative body image and lower self-esteem.⁹⁰

Online bullying seems to be slightly less common than bullying face-to-face. It is also more common to be subject to sporadic online harassment than repeated bullying, several times per week.⁹⁴ Someone talking back to the bully increases the likelihood that otherwise passive bystanders will intervene. Conversely, bystanders become more passive if there are several people attacking the victim. Good family relations and good communication between parents and child decreases the risk of online bullying.⁹⁶

Underlying Factors and Social Media

Are there any underlying factors which can help explain correlations between social media and wellbeing?

Girls use social media more than boys do.³ Gender also seems to be a factor that may affect how social media use makes you feel. Several studies have found that girls' mental state seems to be more negatively affected, whereas the impact on boys' wellbeing is smaller or non-existent.^{49,80,97} The reason for this is unclear. One hypothesis could be that certain types of use of social media could have different effects depending on the user's gender. For example, research has shown that comparing oneself to body image ideals in traditional media partially explains young women's, but not men's, self-esteem, body image and symptoms of depression⁹⁸, something which could apply to social media as well. It has also been shown to be one explaining factor in eating disorders.⁹⁹

Studies have shown that young people who feel alone, or have less social support offline, feel that they get more out of exploring identities online, than those who do not feel alone.¹⁰⁰ Thus, social media could function as a platform to increase a sense of belonging which might otherwise not be possible. However, there is also a heightened risk of increased isolation or problematic usage.

Problematic social media use, sometimes called "social media addiction", is a term which means that social media is being used in a way which has clear negative consequences for the user or their social relations, yet the user is not able to change their behaviour. It is not a clinical diagnosis, but there is research being done on the phenomena. Problematic usage has been observed to be more prevalent with people who have a psychiatric condition, like depression, anxiety and stress, especially with young users.^{77,101} Users who feel a strong emotional dependency on social media seem to experience more negative emotions in relation to their usage than users who do not feel emotionally dependent.¹⁰² It also seems that compulsive use of social media to tackle the feeling of FOMO tends to lead to

users feeling more low over time.¹⁰³

Being of young age seems to be a risk factor for developing problematic usage of social media, likely because children have yet to fully develop the abilities required to self-regulate their behaviour.¹⁰⁴ In other words, there seems to be a number of underlying factors which increase the risk of using social media in a way which has a negative impact on wellbeing.

Gaming

Statistics on the Use of Young People

Sweden

Gaming is a common leisure activity for Swedish children and teenagers, particularly for young people aged 9–12. For older groups, the proportion of people who game decreases. Boys spend more time gaming than girls, and this difference becomes most pronounced from ten years on.³ One out of three Swedish boys spends more than three hours per day gaming. Children with neurodevelopmental disorders, like ADHD, spend more time gaming and do it more often than children without neurodevelopmental disorders.

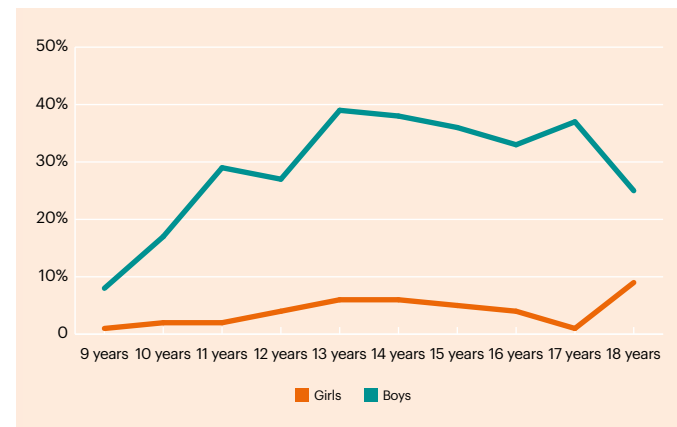


Figure 12 The proportion of young people ages 9–18 who spend more than 3h/day gaming in 2018 (Ungar & medier, 2019).

	Children with neurodevelopmental disorders	Children without neurodevelopmental disorders
Gaming every day	40%	26%
Gaming >3h/day	40%	25%

Proportion of children between ages 13–16 who spend time gaming every day with, and without neurodevelopmental disorder. From Attentions and the Swedish media Council report Nätkoll, 2016.³⁸

Gaming and Mental Wellbeing

Since the breakthrough of the home computer in the 1980's, there has been an ongoing discussion about how gaming affects children. Considering how common gaming is, there is relatively little research on the impact of gaming on the mental health. The focus has been on other outcomes, for example how gaming affects cognitive functions or aggression.

How does gaming affect young people's mental wellbeing (so called direct effects)?

There have not been any research reviews or meta-analyses identified summarizing the link between gaming in general and mental wellbeing for the age group of interest. Furthermore, we have not found any studies with randomized, controlled design on how gaming affects wellbeing. The following section describes the studies identified using a longitudinal design to investigate possible associations between gaming and mental wellbeing over time. We will also describe findings from research reviews that cover topics like gaming disorder, effects on aggressive behaviour and cognitive functions.

Time Spent Gaming

Different studies assessing young gamers over time report partially different findings. One smaller study of young children (194 children ages 7 and 11) showed that the amount of time spent gaming could predict a child developing emotional

problems one year later.¹⁰⁵ Furthermore, it showed that children who were competing in gaming were more likely to develop social problems over time – but this finding only emerged in children who spent “a lot of time” gaming (in the study defined as more than 8h/week). However, two other longitudinal studies of slightly older children have not been able to show these links. One Canadian study tracking 3,800 young people from when they were 12 years old to 16 years old found no link between time spent gaming and feeling increasingly low.⁴⁷ The same was seen in a Norwegian study of almost 2,000 participants between ages 13–17.¹⁰⁶

The Role of Gaming

There are several possible reasons to engage in gaming.¹⁰⁷ For many it has a high entertainment value, and thus naturally gives the gamer joy.¹⁰⁸ Since many games are based on tackling challenges, gaming can create a sense of accomplishment and achievement, and often this takes place gaming together with others. The social element is common in many games today: gaming together with, and against, other players, and chatting and talking with the other players while gaming. This way, gaming becomes a platform to socialize, both with friends and making contacts with potential new friends. There are indications that how you play, and who you play with, affects wellbeing more than the actual game you play.¹⁰⁹

Gaming and Mental Health Problems

Gaming can also be a temporary relief from other problems and be a way to deal with uncomfortable feelings or emotions. Studies show that there is an increased risk for developing a problematic gaming behaviour or mental health problems when gaming is used as a way to escape problems.^{110,111} One Norwegian study that followed 2,000 17-year-olds for three years showed that aggression, depression and loneliness were linked to the extent of gaming one year later, both for engaged players, problematic players, and players with gaming disorder,



You can't put the responsibility for setting boundaries on a 13-year-old. There should be an age limit so young people can't use social media. Like, you would have to verify your age with a picture of your passport or something.

compared to participants who did not play or played in a less engaged way.¹¹⁰ The study also showed an effect in both directions where those who felt more depressed or lonely were more likely to develop problematic gaming, but also that those who already had a problematic gaming were more likely to report feeling low or lonely.

Different Types of Games

Studies do not always make distinctions between different types of games. However, the effects of gaming seem to be different depending on the type of games. One popular type of games is massive multiplayer online role-playing games (MMORG), for example World of Warcraft. Negative consequences of MMORG gaming has only been observed among “addicted” or “problematic” gamers, not with other players.⁹¹ Conversely, the studies highlight the positive aspects of gaming as being challenging, a way to socialize, and that it brings joy.

Another genre is exergames (abbreviation of “exercise games”, games that includes physical exercise) which seems to have some positive effect on mental wellbeing among children and young people.¹¹² Active games can be seen as a good alternative to staying sedentary and as a compliment to physical activity like exercise and sports.¹¹³

Gaming Disorder

In July 2018, the World Health Organization (WHO) classified gaming disorder as a medical diagnosis. The criteria for being diagnosed with gaming disorder includes a consistent pattern of gaming behaviour marked by an increasing loss of control over one’s gaming, that gaming is prioritized over other interests and activities, and that gaming is continued even when it has negative consequences on school work, family, work and sleep, relationships or other important areas. The behaviour should have been ongoing for a minimum of one year, but if all the diagnostic criteria are met and the symptoms are severe, the diagnosis can be made after a shorter period of time (WHO). Longitudinal



studies show that gaming disorder is linked to increasingly feeling low, increased anxiety, social phobia and increased problems with school at a later point of measuring^{114,106,115} The measured prevalence of gaming disorder differs between studies, partly depending on how the condition is defined. One study conducted in seven European countries, reports that 1,6 percent of young people ages 14–17 have gaming disorder, with another five percent experiencing problematic gaming.¹¹⁶ The risk of developing gaming disorder seems to be associated with several bio-psychosocial factors that, in combination with some identified elements in the games, may lead to unhealthy gaming.^{117,118} Today, the economic incentives of competitions and tournaments with substantial prize money are driving factors for an increasing focus on gaming for many. But most people involved in gaming do not develop gaming disorder.

It is important to make a distinction between gaming disorder and engaged gaming. Engaged gaming, unlike gaming disorder, does not have negative consequences.¹⁰⁶ Even if having gaming disorder is associated with spending a lot of time gaming, it is possible to spend a lot of time gaming without developing gaming disorder. A young person who spends a lot of time gaming, yet still does well in school, maintains important relationships and feels physically and mentally well does not fulfill the criteria for diagnosis. It is also important to note that gaming is a different activity to gambling, that is games which include playing for money (for example casino games). Some video games have monetary elements where players can buy equipment for their avatar or pay smaller sums to advance in the game. There is criticism towards game elements that resemble gambling, such as paying to access the content of a box which sometimes contains something of value and sometimes does not (so called loot boxes). To protect children and youth in Sweden, the Swedish government has tasked the Swedish Consumer board to survey and evaluate any inadequacies in the consumer protection pertaining to lottery or casino elements in video games.¹¹⁹

The general advice is that when gaming takes over important things in everyday life, like family, friendship, school, physical activity, sleep and nutrition, it is important to acknowledge and act on it.

Violent Games and Aggressive Behaviour

One frequent question when it comes to gaming is if violent elements in video games affects children and young people in a negative way. For young people's mental wellbeing it seems that games with violent elements may have a negative effect, but the effect is minimal.¹²¹ For a long time, it has been observed that children and adults who play violent games seem to be linked to acting more aggressively.^{121–123,124,125} However, most studies that have shown this link have made the observation in a laboratory setting in direct conjunction to playing the video game, and so far it is not clear that this link would also be true for impacting behaviours in everyday life. The observed effect is small and to some extent explained by underlying factors such as male gender or previous aggressive behaviour that increases the likelihood to both play violent games and behave aggressively.¹²⁴ One longitudinal study indicates that there is no measurable effect on aggressive behaviour from violent games two years later.¹²⁶

Gaming and Cognitive Functions

Based on the rapid and information heavy nature of many action games, there has been research on what impact gaming has on our cognitive functions. A number of studies have noted a link between gaming and an improvement of primarily reaction time and spatial attention.^{127–129} However, there is a need for more studies of higher methodical standard that can explore cause and effect and potential explanations and interaction with underlying factors.^{130,131}

Underlying Factors and Gaming

Are there underlying factors that can explain links between gaming and wellbeing?

Considering how widespread gaming is among young people, there is remarkably little research into the field. There is however some support for gaming having an effect on mental wellbeing on children younger than 11 years old^{105,46} but this effect has not been reported in studies of children older than 11.^{47,106} Most existing studies focuses on risk factors for gaming becoming problematic and/or developing gaming disorder.

Underlying factors such as lower age, emotion control difficulties and impulse control issues, have been linked to increase the risk of problematic gaming.^{75,117} Also, gaming disorder is five times more common in boys than in girls.^{116,117} Differences in the frontal lobes and reward center (striatum) in the brain have been noted in young problematic gamers through brain imaging studies. These differences were also associated with difficulties controlling behaviour.¹¹⁸ If this is cause or effect cannot be conclusively determined at this point in time. However, there is a sensitivity in the development of these reward areas linked to the male hormone testosterone, which could partly help explain the large differences in gaming and problematic gaming between the sexes.¹³²

Children with ADHD or autism has been observed to have an increased risk for problematic gaming compared to children without neurodevelopmental disorders.^{133–135} This could partly be explained by the fact that the functions that are impaired in people with, for example, ADHD such as focused attention and impulse control, are the functions needed to finish a session of engaged gaming in a planned and controlled way.

Other risk factors include low self-esteem, low level social skills, few other hobbies, and poor academic achievement.^{75,117,132} Loneliness and social exclusion also increases the risk for gaming disorder as there is a risk of gaming becoming the primary source of sense of belonging. The motivation for gaming also seems to matter: gaming because it is fun and social reduces the

risk of negative effects, whereas gaming to gain status or as an escape increases the risk of negative effects.¹³⁶

Further factors that increase the risk are absent parents or insufficient parenting and economic vulnerability.¹¹⁷ The type of video game can also have an effect, with MMORPG:s (massive multi online role playing games) often containing addictive elements like rewards and punishment, the possibility for endless gaming and social pressure to play from one's team.

Summary and Conclusion

Based on the three questions addressing the association between young people's wellbeing and 1) indirect effects associated with time spent on digital media in general, and direct effects linked to the content of 2) social media and 3) gaming we can conclude the following. For all of the questions, further research investigating cause and effect, is needed and will be crucial for the field to advance.

Time Spent on Digital Media

Studies show that young people who spend a limited amount of time with digital media are more likely to report mental wellbeing compared to young people who spend no time at all with digital media. Conversely, those who spend substantial time on digital media are more likely to report lower wellbeing. So far, the question of causality still remains unanswered. There are indications that the negative effects can be a result of lack of sleep, lack of exercise, and less time for schoolwork. Underlying factors that are associated with an increased risk for lower mental wellbeing linked to digital media use are: female gender (especially in relation to social media); being younger; neurodevelopmental disorders; and low socioeconomic status.

Social Media

At a group level, research shows that children and youths who spend a substantial amount of time on social media have a tendency to feel slightly worse over time. However, the effect



I've set a time block of 2h/day for social media, but I discard that block several times each day. Only 15 minutes more, over and over again.

is small. The association can be explained by the fact that high frequency users of social media as a group sleep less (indirect effect) and have an increased risk of being subject to online harassment (direct effect). How social media is used seems to be an important factor. Among adults, passive usage of social media seems to have a negative impact on wellbeing by adding to jealousy and feeling low, whereas an active usage can have positive effects like strengthening relations. It is likely that the same is true for young users too.

Young people who suffer from mental health issues can utilize social media to find support, information and share experiences. However, there is a risk of getting caught in an environment which normalizes mental health issues and gives inaccurate advice, which can exacerbate issues like deliberate self-harm. Several other factors seem to play a part in the effects of social media. Female users, users with low self-esteem, users who compare themselves to others, or are already feeling low, are affected more negatively by using social media than other users. It can be especially important to get support promoting a healthy usage for people with these types of vulnerabilities.

Gaming

Research on young people and gaming has largely been focused on other effects of gaming rather than mental wellbeing, for example how gaming affects cognitive functions or tendencies for violence. Among older children, there is no apparent link between gaming and mental wellbeing. However, among children below the age of 11, there is some support for a negative association between gaming and mental wellbeing. For many, gaming is associated with positive aspects, such as entertainment, a sense of development and as a way to socialize. Games which involve physical activities, so called exercise games, seem to promote movement and exercise.

Users who play as a way to avoid life problems and difficult emotions can get a temporary sense of relief, but research shows that this can become problematic and have long term negative

effects. A minority of gamers develop gaming disorder, where the user loses control over their gaming, despite serious negative impact on other parts of their life, such as relationships, school-work and sleep. Vulnerabilities such as difficulties handling emotions, neurodevelopmental disorders, difficulties in school, being socially excluded, and/or limited support from parents are all factors which increase the risk of developing gaming disorder.

Conclusion

Today, digital media is a central part in the lives of both young people and adults. However, so far the knowledge about the effects on young people's wellbeing is limited and there is a need for further, clarifying research assessing cause and effect. The current state of research shows that the impact of digital media depends on who you are, how you use it, how much you use it, as well as other aspects of your life. There is an increased vulnerability for young users and children with existing issues (neurodevelopmental disorders, low self-esteem, feeling low, low socioeconomic status etc) warranting a particular need for support and promotion of sound media usage in these children.

When it comes to social media, there is a weak negative association between time spent and wellbeing, as well as for particular content and wellbeing. Besides the risk of dysfunctional usage which can become a problem, gaming seems to have a limited impact on young people's wellbeing.

Research informs us about evident patterns for groups of people as an average, and can therefore guide which efforts, initiatives and decisions that are likely to affect, in this case, wellbeing on a societal level. With regards to the individual level, it is important to consider the whole picture for each specific individual in order to promote wellbeing rather than strictly applying the general research findings. One of the main conclusions from this report highlights the importance of fulfilling the basic human needs in order to create the best possible conditions to face the inevitable challenges of life.

3. Being Young in a Digital World

The development of digital media creates endless new opportunities for expression, education and entertainment. Out of all human innovations, the Internet has led to one of the most radical transformations of society with consequences for how we make connections, conduct business, and gain insight and influence. Suddenly, everyone with an internet connection has a voice, a possibility to make themselves heard and actually make a difference. But as in so many times in the history of human innovation, the solutions of the first generations are trailed with flaws, unexpected consequences and unforeseen side effects. With increased knowledge and cooperation between industry, science and policy makers, the solutions of future generations will move forward to eliminate some of today's problems with the design and use of digital media.

The big question the large media platforms should ask themselves is: what impact they want to have on human wellbeing? Even if the ambition is to be neutral, large studies on Facebook users have shown that if Facebook's algorithm shows a news feed with more positive words and emotional expression, or the corresponding negative ones, the users are "infected" or inspired, to post status updates expressing more of the same emotional state.¹³⁷ The effects have been shown to be very small, yet this shows that tiny tweaks of algorithms can create micro shifts in the emotional state of Facebook's 2.3 billion users.

In studies of users who have taken a break or quit social media, the net effect seems to be positive, yet small.^{25,26} Furthermore, few people can imagine a future *without* social media, which means that the insights on how social media affects us should not be seen as a reason to quit these platforms, but rather as an encouragement to develop platforms which promote wellbeing.



No interaction design is neutral and since today's solutions encourage spending a lot of time on the platforms, there is a risk that the built-in mechanisms promote excessive usage. These mechanisms pose a challenge for humans in general, and children and youth in particular, to use these media in a balanced way. A clear sign of this is that three out of four 17–18 year-old say that the time they spend each week on digital media leads to them not having enough time for other things they should be doing.³ This is a problem which requires cooperation between several parties, especially between tech companies, scientists and policymakers who together can establish guidelines and recommendations which protect children and young people from excessive or harmful use of digital media. One of the conclusions shown in this research review is that the association between digital media use and feeling low, for young people, is partly explained by the crowding out of protective factors (such as sleep, exercise, etc). This means that there are measures which can be taken by different actors to support a healthier use of digital media. Some of these measures are to create attractive alternatives to an increasingly sedentary lifestyle, rather than being focused solely on digital media itself. For young people with underlying vulnerability factors, such as low socioeconomic status, being very young or having been diagnosed with neurodevelopmental disorders, these measures should be viewed as particularly important.

Another conclusion is from the effect of the experiences encountered on digital media, where especially online harassment plays a part in the connection between feeling low and social media in particular. To address this problem, there needs to be action taken to improve online security, ethics, legal

protection, as well as positive role models for an improved dialogue.

All institutions and actors should strive to take their responsibility to make digital usage among children something which facilitates and deepens contact with friends, leads to focused and undisturbed school work, and encourages participation in society, while at the same time making sure that fundamental needs are satisfied. The responsibility to ensure that everyone can access and take part of both knowledge and preemptive measures rest on governmental organisations and authorities, the schools, the healthcare system, legal guardians and the individuals themselves. When it comes to children and young people, the cooperation between the different actors is of utmost importance to identify environmental risks, behaviours and intervening when need be. Here too, technology can continue to fill an important function by providing easily accessible platforms for information, support and help. Interactive solutions functioning as a resource to use in vulnerable situations are already used today to give guidance on how to improve one's wellbeing.

In the next sections we look at target audience specific recommendations developed by the authors of this research review together with Mind. These recommendations are based on four identified areas from the research review: balance, content, ethics and security.

Perspectives and opinions from representatives on actions and measures that could be taken from each respective target audience have also been collected. The target audiences are: young people themselves, legal guardians, policy makers and tech developers.



You're curious by nature – if you can use it, you're gonna use it.

Said about SnapMap

Target Audience Recommendations

Young People

Digital media brings fantastic opportunities. Much of what previous generations had to do in the analog world now happens in digital media. This feels completely natural when you have grown up with digital media, but sometimes grown ups won't understand. How can you as a young person help yourself to use digital media in a way that makes you feel good?

Balance

■ **Find a digital balance.** Get a usage tracker app for your smartphone, computer or tablet to see how much you use your devices. Remember that apps and games are designed so you will spend as much time as possible using them. Make sure you have time to do those things all humans need to do to feel good, like getting enough sleep, meet other people, be physically active and being able to focus on school work when it is needed. Maybe you have others around you who can come up with ideas on how to support each other to get more sustainable digital habits?

Content

■ **Spend your time with things that make you feel good.** Think about how you use digital media. What kind of content do you experience in a normal day and how does that content make you feel? The content you spend time on affects you. Talk with your friends about which accounts you follow and how that content makes you feel.

Ethics

■ **Be nice.** The way you act online has an effect on other people. Before you post something, consider how you would like it if someone wrote this about you or to your friend. If the answer is negative, find another, better way to express yourself. If someone else is being mean, what do you do then? You also help create expectations on how we all "should" act online. That includes how quickly one needs to reply, what we post and how we treat each other.

Security

■ **Be aware of dangers.** There are a lot of people with fake accounts who are not looking out for children's best interests. These people could pretend to be someone you would most likely accept a friend request from. They often start with friendly compliments, or with threats about posting a picture of you they claim to already have and demand you to send a picture where you are scantily dressed or naked. It is against the law to ask a child for naked pictures and if this happens you should report it to the police. If possible it is best to video the conversation using another smartphone (taking a screenshot can be reported to the other user in some apps). If this happens to you, talk to someone who you think can help you, like a parent, a friend or an older sibling.

Legal Guardians

As a legal guardian you have an important responsibility for your child's wellbeing. You have a responsibility to protect your child from dangers and make sure your child does not harass or bully other children. These are general recommendations for how you can support your child to a positive and healthy use of digital media.

Balance

- **Limit screen use for small children.** Small children younger than two years old primarily need human interaction to help their development, and both the child's and grown up's use of digital devices can be an obstacle. Make sure that the child gets plenty of human stimulation, movement, attention, comfort and language training, and that screen use does not take time away from other important activities.
- **Encourage a digital balance** Support the child in creating digital habits and approaches which sees to all the child's needs. Find a balance where the digital habits still enable 8–10 hours sleep, time for homework and at least 60 minutes of physical activity every day. For children who enjoys gaming which includes physical activity, so called “exergames,” those games can be used as a complement to other exercise. Support the child to find routines which avoids long periods of being sedentary, for example by getting up and switching activity in between rounds of gaming.
- **Agree on common ground rules at home.** Get together and talk about common ground rules for using digital media. What do you do at meal time, bedtime and when you are doing activities together? Are there problems which often happen and how could you help prevent them together? If you want, you can set up a trial period and then, after a couple of weeks, evaluate how the ground rules have worked.
- **Act on problematic usage.** If you notice that the digital activities start to take over other important needs, bring it up with the child. How does she or he think about their usage? Are there other things which are affecting the digital use, such as feeling that the homework is too difficult or wanting to escape troubling feelings? Does the child have any ideas on the type of support they need? Try to solve the problem together. If the problems get worse despite repeated attempts of support, or if the problems start having an effect on the child's health, get in contact with healthcare.
- **Be a role model.** We all know the saying: “Do as I say, not as I do”. Take stock of your own use of digital media. Think about which habits and behaviours you teach your child. Also consider which pictures, and other information about your child, you share on social media. The child can have a very different perspective on the photo/information than you do, so ask before you share.



My dad is constantly on his smartphone. It is almost impossible to talk to him without him checking it. So my brother does what my dad does.

Content

- **Get engaged in your child’s digital activities.** Getting an understanding of what happens on digital media makes it easier to support a positive and healthy usage. This can be done in a number of ways. You can download the apps, games or service that your child uses and see how it works. YouTube has video clips of games, ”gameplay”, which quickly let you see a game’s content and how it works. With the youngest children, it can be a good idea to sit beside them when they play and help the child understand what they are experiencing by reinforcing messages and steering the content. For children who have their own access to technology, you need to agree on how much insight you as a parent should have. Make it a natural part of conversation by asking what is happening online and let the child show you if they want. If the child follows specific social media channels or enjoys certain games, try and make it into something you do together as a way of spending time and getting closer to each other
- **Work together with other adults.** Work together with the school, other grown ups and the parents of your child’s friends, to help each other set guidelines and support the children in their digital media use.

Ethics

- **Talk to your child about digital ethics.** When you and your child talk about digital media, take the opportunity to ask questions about how to behave online. What does the child think is okay to write, post and share? Talk about the effects it has on the person seeing it. Also, talk about how your child can act if someone else is being bullied online. For example, you can write that you do not agree, make a video of the content (this is better than a screenshot since some apps notifies the other user that a screenshot has been taken) and show it to an adult, or use the “report content” function.

Security

- **Be/stay up to date.** Read up on each digital activity you give your child access to and make a risk assessment for each based on the age of the child (for example, private or public account, chat function etc). To be engaged in, and have an open dialogue about what the child does on digital media and who the child is in contact with can make it easier for the child to tell you if something distressing happens.
- **Be aware of your responsibility.** Remember that it is the legal guardian’s responsibility to protect children under 18, and to make sure they do not commit crimes online, for example by sending threatening messages or sexual content. As legal guardian you can be financially liable for your child’s actions.
- **Talk about dangers online.** Be aware of the risks that exists online, with potential perpetrators having access to the same apps and services that children and young people use. Talk with your child about these risks and what you could do together if something upsetting happened. It is common that children are reluctant to talk about bad experiences fearing negative consequences, like the parent getting mad and/or removing the app. Reduce this risk by talking about how you would handle such a situation together, regardless of what part the child played.

Tech Developers

There are several tech developers, such as hardware developers, software developers and broadband providers, who can all be a part of facilitating a healthy digital usage. The way the services are designed to have an impact on the users behaviour. There is no neutral design. Instead, the question is what behaviours the design is made to enable the user to do. This can include behaviours in line with the user's interests (finding a support group online) or that goes against their interests (neglecting sleep to stay up gaming). Since children are in a particularly vulnerable position, services who are only, or partly, geared towards young people, should be designed with special consideration to their vulnerability, security and wellbeing.

Balance

- **Do not encourage excessive use.** Today, continuous use of digital media, both in social media and gaming, is encouraged by rewarding the amount of activity within a specific time frame (for example weekly points) or over consecutive days of use (for example Snapstreaks). This makes it difficult to take a break or quit for those who wants to. These kind of incentives should be carefully evaluated and, in cases where they have a negative impact on the users needs, be limited.
- **Help users find a digital balance.** Develop solutions that visualizes patterns of digital usage and supports sustainable digital habits. Examples of such functions could include; reminders to take a break, solutions to reduce distractions and enable focus during certain times/activities, promote sleep by automatically reducing the amount of blue and violet light when it is dark, or built-in incentives to stop use after a certain amount of time.

Content

- **Limit manipulation of pictures which promote unhealthy beauty ideals.** Manipulated images which promote unrealistic beauty ideals have been shown to have an impact on self-esteem, body image and the development of eating disorders among girls.⁹⁹ Therefore, features which encourage such image manipulation should be limited. Instagram recently removed filters which could encourage plastic surgery.¹³⁹ There are currently several initiatives related to these issues being proposed covering both policy making and social sustainability aspects.¹⁴⁰
- **Integrate online support services for children and young people into platforms.** Today, many young people turn to the internet to find information and support of their mental health. This is an opportunity for tech companies to make a difference by working together with non-governmental organizations that work to improve young people's health. There are several successful Nordic examples of such collaboration, like the Finish organization, MIELI Mental Health Finland, that have created chat rooms in the gaming forum Discord where they discuss mental health.

Ethics

- **Develop technology which promotes young people’s wellbeing.** Considering children’s distinct vulnerability, tech companies should create ethical guidelines for the interface directed to young users. The young people themselves should be included in this work. The United Kingdom has come further in this work and have, after an initial inquiry, proposed regulation to protect children and young people from harmful effects.¹⁴¹ Tech companies should also follow the ethical guidelines for behavioural design for all their users, which means that all exerted influence should be transparent and only flow in the direction the user has given their permission to.¹⁴² Read more on how to design digital services with social sustainability as the main focus on, for example, Center for Humane Technology.
- **Share available user data for research purposes.** Today, research into digital media use relies primarily on self-reported data, despite that this data in many cases is already objectively measured on the platforms.²⁸ To develop digital solutions that promotes mental wellbeing, we first need to understand today’s baseline. Tech companies should establish partnerships with independent academic institutions, and share anonymized user data with them, so that this data can be used for research. Research which could be used to increase our understanding of modern human behaviour and phenomena, digital media use and wellbeing.

Security

- **Proactively identify and block harmful content.** Today, several platforms use artificial intelligence to identify both online hate speech and illegal content, and then censor or remove that content immediately. Facebook has helped users who communicate suicidal thoughts by guiding that person into a sequence of events to help the user change their mind, for example by suggesting that the user contact a friend they seem close to, or to seek support with a local chatline for mental health problems. This type of technology could be further developed for, for example, early identification of “grooming” or sexual harassment, or as a way to support the victim or block the perpetrator.
- **Require identity verification online.** Today, online harassment, grooming and dissemination of online hate speech is enabled by the possibility to create anonymous accounts where people are never held accountable for their behaviour or actions online. Third Party-solutions, like TRAST, could work as an independent guarantor of identity to protect children from harassment and illegal activities. With the UNCRC becoming law in 2020, this is covered in article 17, where the government should “encourage the development of appropriate guidelines for the protection of the child from information and material injurious to his or her well-being”.
- **Ensure moderating of group communication.** Digital platforms, and groups on these platforms, can provide support for people who suffer from mental health problems, but there is a risk that harmful behaviours are reinforced if these groups are not properly moderated. Tech developers should create mechanisms to ensure that harmful communication is minimized, for example by requiring moderating of hashtags and newly created groups to create secure environments.

Policy Makers

Digital media opens up new worlds for young people to express themselves in. The rapidly growing global technological development comes with both risks and possibilities. The sheer speed of development means that policy makers in every country needs to stay up to date to not fall behind, but it also means that there might be a need for other incentive structures to guide this market when regulations and law making cannot keep up with the tempo. Each country should develop regulations to ensure their citizens' health, rights and integrity. Here are some of the recommendations which requires political initiative.

Balance

■ **Make mental wellbeing part of the school curriculum.**

Knowledge and skills to achieve mental health should be as important in the school curriculum as physical health is. To ensure the quality and equal dissemination of this knowledge, it should be included in the school's mission. This education should include how the use of digital media affects wellbeing, and teach health promoting digital habits. Training to protect oneself against online harassment, and what to do if you become a victim of online harassment, should also be included.

Content

■ **Develop guidelines for content responsibility.** Today, social media platforms have no editorial responsibility equivalent to that of a publisher and have positioned themselves as being neutral platforms that only make the users content available, while some of the platforms actively remove some content (see above). Recent proposals have suggested establishing new guidelines that at least makes the platforms share the responsibility for content.¹⁴³ Since the platform algorithms largely decides what content users see, something which has been shown to impact how we feel, the platforms have a responsibility. For example, 70 percent of

the content consumed on YouTube is recommended by the platform algorithm.¹⁴⁴

Ethics

■ **Create a yearly, multidisciplinary, digital forum.**

Considering the rapid technological development, a yearly form where policy makers, young people, civil society, scientists and tech companies meet to discuss current challenges linked to the wellbeing of young people and digital media.

■ **Scrutinize digital media and their effects on wellbeing.** The global scope of the digital media platforms means that global cooperation between companies, policy makers, and scientists is needed to make policies streamlined and coherent. An independent certification that shows the digital service is compliant with UNCRC could be established. Other global challenges include a) making sure the technology is used in a balanced way b) harmful content is limited c) and promote wellbeing. One of the biggest tech companies spokesperson has publicly stated that they welcome regulations, as their primary obligation lies with their stockholders.¹⁴⁵

Security

■ **Increase protection against online crime.** Laws on abuse and harassment online needs to be constantly updated. Furthermore, there is a need for increased resources to the police to detect and solve online crimes such as extortion and grooming. Resources need to be specially allocated to crime prevention. To detect and solve online crimes, it is crucial that young people feel safe in talking about what has happened to them and report it to the police. Therefore, it is crucial that police authorities provide information about what constitutes crime online as a way to establish new norms, and give courage and determination to the victims so they have the courage to report.



You can't say "don't use social media". But maybe instead we can try to find some way to take a few years back and find other ways of socialising for 12–15-year olds. In secondary school, most people have stopped playing sports and stuff and it's not that easy to find other ways to socialize.

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Mind has developed this research review to present a current state of science and research on how young people's mental health is affected by the use of digital media, and from this provide recommendations on how to promote young people's mental wellbeing in relation to digital

technology. With this research review, Mind want to increase understanding and awareness for parents, policy makers and tech developers so they promote using digital media in a way that strengthens the mental wellbeing of children and young people.

